REPORT NO. 161-17230-00

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

1040 BANK STREET, OTTAWA, ONTARIO

MAY 15, 2017

WSP

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

1040 BANK STREET,

OTTAWA, ONTARIO)

Prepared For: Windmill Development Group Ltd.

Project no: 161-17230-00
Date: May 15, 2017

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario K2B 8K2 Canada

Phone: +1-613-829-2800
Fax: +1-613-829-8299
www.wspgroup.com

May 15, 2017

Windmill Development Group Ltd.
Attn: Justin George
1306 Wellington Street West
Ottawa, ON K1Y 3B2

Subject: **Phase Two Environmental Site Assessment**
1040 Bank Street, Ottawa, Ontario
161-17230-00

Dear Mr. George,

We are pleased to present our Phase Two Environmental Site Assessment report prepared for the above-noted property, for your review. The assessment was completed in general accordance of Ontario Regulation 153/04. Based on the findings of the investigation, elevated Sodium Absorption Ratio slightly exceeded the regulatory criteria in two samples of surficial soils. The rest of analytical results for soil and groundwater samples collected at the Site met the applicable criteria.

We trust that this information is sufficient for your current needs. If you have any questions or require further information, please contact us.

Yours truly,

WSP Canada Inc.

Kathryn Maton, C.E.T.
Environmental Technologist

Natalia Codoban, M.Eng, P.Eng., QP$_{ESA}$
Hydrogeologist / Environmental Engineer

WSP Canada Inc.
2611 Queensview Drive, Suite 300
Ottawa, Ontario K2B 8K2

Phone: +1 613-829-2800
Fax: +1 613-829-8299
www.wspgroup.com

EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by Windmill Development Group Ltd. to conduct a Phase Two Environmental Site Assessment (ESA) for a property located at 1040 Bank Street, Ottawa, Ontario (the "Site"). The property is legally described as LTS 6 & 8, PL 36, E/S Galt St, LT 3, PL 36, W/S Bank St., Save & Except Parts 1& 2, 4R 8285, Ottawa / Nepean. The Site location plan is shown on Figure 1.

The Site contains a development named 'Southminster United Church' (Figure 2), defined as 'community use' under O. Reg. 153/04. The operations at the Site include church function with members of the community, residential and rental spaces for indoor residential activities (e.g., music classes, yoga, etc.) and one residential apartment.

The site area is approximately 3,322 square metres (0.332 hectares). There are two connected structures on the Site. These include the main church building (referred to as 'Southminster building') on the east side, and a building used for general church functions / community activities, referred to as 'Southminster Memorial building' on the west side. The Site is grassed with concrete pathways leading to the entrances. Asphalt surfaces are present along the west property line and in the northwest corner of the Site. A section in the northwest corner of the Site is fenced.

We understand that the Phase Two ESA is required for a potential re-zoning to residential land use. Change in land use from 'community' to 'residential' represents a shift to a more stringent land use, a condition that would make the filing of a Record of Site Condition (RSC) mandatory under the Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*.

This Phase Two ESA was conducted in general accordance of O. Reg. 153/04. This report may be used to support a future RSC application for the property, provided a legal survey of the property is included in the RSC application.

Based on the findings of the Phase One ESA, WSP identified four Areas of Potential Environmental Concern (APECs) at the Site. These APECs are associated with the importation of fill during construction of the buildings; the presence of a hydraulic elevator; the potential historical storage of coal on the Site; and offsite PCAs that may have attributed to APECs onsite through contaminant migration from the area upgradient to the Site (WSP Canada Inc., May 2017).

The Phase Two ESA included installation of five monitoring wells MW16-1, MW16-2, MW16-3, MW16-4 and MW16-5 to a maximum depth of 21.9 m below ground surface (mbgs) and collection of soil and groundwater samples for chemical analysis. Soil and groundwater samples were analyzed for concentrations of metals and inorganics, Volatile Organic Compounds and Petroleum Hydrocarbon Compounds. Soil samples from well MW16-4 were submitted for the analysis of Polycyclic Aromatic Compounds. Analytical results were compared to the Ontario Ministry of the Environment and Climate Change Table 2: Full Depth Generic Site Condition Standards (SCS) for use in a Potable Ground Water Condition for industrial / commercial / community (ICC) property uses and coarse-grained soils.

Based on results of the Phase Two ESA, the following conclusions are made:

- The flow of shallow groundwater is to the northeast, towards the Rideau Canal (Figure 3).
- The Sodium Absorption Ratio (SAR) in a soil sample collected at the depth ranging between 0.8 and 1.4 mbgs at MW16-4 was 5.42 (Figure 4), marginally exceeding the Table 2 SCS of 5. This sample was collected from the silt fill layer.
- The SAR in a soil sample collected at the depth of 0.1 and 0.6 mbgs at MW16-5 was 5.95, slightly exceeding the Table 2 SCS of 5. This sample was collected from the silty sand fill layer.

- Concentrations of other tested parameters in soil were below the Table 2 SCS.
- Contaminants were not identified to be present in groundwater samples. Groundwater from well MW16-1 was not sampled, as the fine-grained material in the soil clogged the footvalve during purging. Results of the groundwater samples collected from four other wells were found to be below the Table 2 SCS.
- It is interpreted that elevated SAR in surficial soil samples collected at MW16-4 and MW16-5 is related to road salting activities during winter months. According to Section 48(3) of O. Reg. 153/04, this is not considered to be contamination.
- No further contaminant investigations are recommended to be completed to support the land transfer of the west side of the property.

TABLE OF CONTENTS

TABLES

APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

WSP Canada Inc. (WSP) was retained by Windmill Development Group Ltd. to conduct a Phase Two Environmental Site Assessment (ESA) for a property located at 1040 Bank Street, Ottawa, Ontario (the "Site").

The property is legally described as LTS 6 & 8, PL 36, E/S Galt St, LT 3, PL 36, W/S Bank St., Save & Except Parts 1& 2, 4R 8285, Ottawa / Nepean (Appendix A). The Site location plan is shown on Figure 2.

The Site contains a development named 'Southminster United Church' (Figure 2), defined as 'community use' under O. Reg. 153/04. The operations at the Site include church function with members of the community, residential and rental spaces for indoor residential activities (e.g., music classes, yoga, etc.) and one residential apartment.

We understand that the Phase Two ESA is required for a potential re-zoning of the property to residential land use. Change in land use from 'community' to 'residential' represents a shift to a more stringent land use, a condition that would make the filing of a Record of Site Condition (RSC) mandatory under the Ontario Regulation (O. Reg.) 153/04 under the *Environmental Protection Act*.

This Phase Two ESA was conducted in general accordance of O. Reg. 153/04. This report may be used to support a future RSC application for the property, provided a legal survey of the property is included in the RSC application.

1.2 SITE DESCRIPTION AND PROPERTY OWNERSHIP

The Site is owned by Trustees of the Southminster United Church and Trustees of the Ottawa South Congregation of the Methodist Church. The Site is located in the northwest quadrant of the intersection of Bank Street and Aylmer Avenue in a mixed residential, commercial and parkland area of the City of Ottawa. The Site boundary is shown on Figure 2.

The Site is irregular in shape with approximately 53 metres of frontage along the east side of Galt Street, 88 metres of frontage along the south side of Aylmer Avenue and 16 metres along the west side of Bank Street. The site area is approximately 3,322 square metres (0.332 hectares). There are two connected structures on the Site. These include the main church building (referred to as 'Southminster building') on the east side, and a building used for general church functions / community activities, referred to as 'Southminster Memorial building' on the west side (see Figure 2). The Site is grassed with concrete pathways leading to the entrances. Asphalt surfaces are present along the west property line and in the northwest corner of the Site. A section in the northwest corner of the Site is fenced.

Authorization to proceed with the work was granted to WSP by Mr. Justin George of Windmill Development Group Ltd. on December 1, 2016. Mr. George can be reached at 613-325-2500 or justin.george@windmilldevelopments.com. Property information for the Site is provided in Table 1 below:

Table 1 Property Information

CRITERIA	PHASE ONE PROPERTY INFORMATION
Current Property Owners	Trustees of the Southminster United Church Trustees of the Ottawa South Congregation of the Methodist Church
Phase One Representative	Justin George Tel: 613-325-2500 Email: justin.george@windmilldevelopments.com
Municipal Address	1040 Bank Street, Ottawa, Ontario
Property Identification Number (PIN)	04143-0321 (LT)
Legal Descriptions	LTS 6 & 8, PL 36, E/S Galt St; LT 3, PL 36, W/S Bank St. Save & Except Parts 1&2, 4R 8285; Ottawa/Nepean

1.3 CURRENT AND PROPOSED FUTURE USES

As described in Section 1.1, the Site contains an institutional development named 'Southminster United Church' (Figure 2). The operations at the Site include church function with members of the community, residential and rental spaces for miscellaneous classes for the general public (e.g., music classes, yoga, etc.) and one residential apartment. We understand that the Phase Two ESA is required for a potential re-zoning to residential land use.

1.4 APPLICABLE SITE CONDITION STANDARD

WSP identified the applicable generic soil and groundwater standards based on the following information available for the Site:

- The Rideau Canal is located approximately 45 m north of the Site, which flows east, turning north approximately 400 m east of the Site towards the Ottawa River;
- Records indicated that 12 wells were used to be located in the Phase One Study Area. Eleven wells were identified as abandoned and one well was identified to be used for water supply;
- Surrounding properties are a mix of residential, commercial and parkland land use;
- Two connected buildings are currently present on the Site and are used for institutional purposes;
- The Site is present at approximate elevation of 72-74 meters above sea level (masl) and slopes down to the north towards the Rideau Canal. The surrounding lands slope to the northeast;
- Surficial geology mapping and well records suggest the Site consists of sandy and silty compact diamicton. Bedrock consists of the Middle Ordovican rocks, which include limestone, dolostone, shale, arkose and sandstone. The bedrock typically starts at 9 meters below the ground surface (mbgs) in this area;
- The Site is not considered an "environmentally sensitive" site, as defined by O. Reg. 153/04;
- Field observations indicate that the soil at the Site is consistent with the definition of 'coarse textured' soils of O. Reg. 153/04; and,
- Stratified soil conditions were not used for evaluating laboratory results.

Based on the above site specific details, soil and groundwater quality at the Site was compared to Table 2: Full Depth Generic Site Condition Standards (SCS) in a Potable Ground Water Condition Site Condition Standards for industrial / commercial / community property uses, set out in the Ministry of the Environment and Climate Change (MOECC) publication *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act* (April 15, 2011), hereinafter referred to as the "MOECC Table 2 SCS".

2 BACKGROUND INFORMATION

2.1 PHYSICAL SETTING

The surficial geology of the north portion of the Site and the north portion of the Phase One Study Area consist of clay and silt deposits (Chapman et al., 2007). Bedrock within the Phase One Study Area consists of the Middle Ordovician rocks of the Shadow Lake Formation. These include limestone, dolostone, shale, arkose and sandstone (Ontario Geological Survey, 2011).

The review indicated that the regional topography of the area generally slopes to the northeast. The Site is present at the approximate elevations of 72-74 masl. The principle direction of local groundwater flow in the overburden is anticipated to be to the north, towards the Rideau Canal.

The surface topography of the Site slopes down north towards the Rideau Canal, present approximately 45 m north of the Site. The Rideau Canal meanders to the east and then to the northeast of the Site.

2.2 PAST INVESTIGATIONS

2.2.1 DRAFT PHASE ONE ESA – 2017

A Phase One ESA was prepared for the Site by WSP on May 15, 2017, in general accordance of O. Reg. 153/04.

Through an evaluation of the information gathered from the records' review, interviews, and the Site reconnaissance, WSP identified Areas of Potential Environmental Concern (APECs) with the potential to impact soil and groundwater conditions at the Site. The APECs identified at the Site included:

APEC-1 (entire Site): Fill materials of unknown origin may have been imported to the Site for construction activities between 1925 and 1931. The presence of imported fill on the Site has the potential to impact the soil and groundwater quality of the Site.

APEC-2 (east side of the 'Southminster Memorial building'): A hydraulic elevator has been present in the east side of the 'Southminster Memorial building' since at least 2002. The presence of a hydraulic elevator / oil tank on the Site has the potential to impact the soil and groundwater quality.

APEC-3 (west side of the 'Southminster building'): Based on observations during the Site visit, a chute located in the storage room below the basement of the 'Southminster building' may have been used as part of the former heating system of wood and / or coal. The historical use / storage of coal on the Site has the potential to impact the soil quality of the Site.

APEC-4 (area along the south side of the Site): Based on observations during the time of the Site visit, review of historical records, the following former / current operations on south properties have the potential to impact the soil and groundwater quality of the Site:

- Various properties south of the Site were former gasoline service stations with associated underground storage tanks (USTs) from at least 1930 to 2011.

- Automotive repair garages and car sales' centres were present on various properties south of the Site from at least 1949 to 2016.
- A printing business has been present southeast of the Site at 1069 Bank Street since 1986.
- Based on the review of historical records, launders and cleaners have operated on various properties south of the Site from at least 1926 to 1958.

A Phase Two ESA was recommended to be completed for the Site, to investigate soil and groundwater quality in the vicinity of the identified APECs, and to assist in the preparation of a remedial or risk management strategy for the development of the Site, if required.

2.3 CONTAMINANTS OF CONCERN

Contaminants of potential concern (COPCs) in soil and groundwater, associated with past activities at the Site and adjacent lands include: metals and inorganics (MI), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs) and petroleum hydrocarbon compounds (PHCs).

3 SCOPE OF THE INVESTIGATION

3.1 OVERVIEW OF THE SITE INVESTIGATION

The scope of work for the Phase Two ESA is in general accordance with the objectives, outlined in O. Reg. 153/04. The sampling methods complied with the requirements established by the MOECC in the Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, 1997 and technical updates provided to support regulatory amendments. The tasks completed during the Phase Two ESA included:

- Preparing a sample and analysis plan to document the rationale for the investigation, including the number of sampling points, sampling frequency, analytical parameters and media to be sampled;
- Co-ordinating with the drilling contractor George Downing Estate Drilling Ltd. (Downing) and private / public locators to obtain utility locates near the proposed borehole locations;
- Providing supervision during drilling to obtain samples of soil that are representative of the worst case conditions observed during the investigation;

Advancing five (5) boreholes to a maximum depth of 21.9 m. Soil samples were recovered from each borehole to depths ranging between 14.9 and 16.0 mbgs, except for one borehole advanced to the depth of 21.9 mbgs for geotechnical purposes. Each of the boreholes were completed as groundwater monitoring wells, constructed with 31 mm diameter polyvinyl chloride (PVC) pipe with 3 m long screens and locked monument (MW16-4) or flush-mounted casings;

- Collecting, screening, and classifying soil samples at each borehole for possible laboratory analysis. Soil sample headspace vapours were monitored using a combustible gas indicator (CGI) and photoionization detector (PID), to assess the presence of VOCs and combustible petroleum contaminants;
- Selecting soil samples for submission to ALS Environmental (ALS), an accredited laboratory for chemical analysis of MI, PAHs, VOCs and PHCs;
- Monitoring subsurface vapour concentrations and water levels in the monitoring wells. Groundwater samples were collected from the monitoring wells and submitted for the analysis of MI, PHCs and VOCs;
- Collecting quality assurance / quality control (QA/QC) duplicate samples at a frequency of 10% throughout the field program, in compliance with regulatory requirements; and
- Comparing the results of soil and groundwater analysis to the MOECC Table 2 SCS.

3.2 MEDIA INVESTIGATED

A Sampling and Analysis Plan (SAP) was developed prior to the field sampling events, which outlined the proposed sampling locations and related analysis for the soil and groundwater investigation. The sample locations are shown on Figure 2 and the SAPs are provided in Appendix A.

3.3 PHASE ONE CONCEPTUAL SITE MODEL

The preliminary Phase One Conceptual Site Model (CSM) presented in the Phase One ESA report (WSP, May 2017) includes figures and narrative that provided the logical basis for the interpretation of PCAs and APECs on the Site. The Phase One CSM is summarized as follows:

- The Rideau Canal is located approximately 45 m north of the Site, which flows east, turning north approximately 400 m east of the Site towards the Ottawa River;
- Records indicated that 12 wells were used to be located in the Phase One Study Area. Eleven wells were identified as abandoned and one well was identified to be used for water supply;
- Surrounding properties are a mix of residential, commercial and parkland land use;
- Two connected buildings are currently present on the Site, which are currently institutional;
- The Site is present at the elevation of approximately 72-74 masl and slopes to the north towards the Rideau Canal. The surrounding lands generally slope to the northeast;
- Surficial geology mapping and well records suggest the Site consists of sandy and silty compact diamicton with portions of limestone, dolomite and sandstone outcrops. Bedrock consists of the Middle Ordovican rocks, which include limestone, dolostone, shale, arkose and sandstone. The bedrock typically starts at 9 mbgs in this area;
- Based on the review of records, interviews, and the site reconnaissance completed as part of the Phase One ESA, WSP identified several PCAs for the Phase One ESA Study Area. Based on this, four APECs were identified for the Site. These PCAs with a PCA code include:
  - 30. Importation of Fill Material of Unknown Quality;
  - 28. Gasoline and associated products storage in fixed tanks;
  - Other – coal use;
  - 52. Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems;
  - 37. Operation of Dry Cleaning Equipment (where chemicals are used); and,
  - 31. Ink Manufacturing, Processing and Bulk Storage.

Information considered for the development of this CSM was gathered from numerous sources (i.e., aerial photographs, city directories, environmental database searches, physical setting sources, historical reports, interviews and a site reconnaissance), which reduces the potential for not identifying a former property use or PCA.

3.4 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

The SAPs prepared in advance of the Phase Two ESA sampling events are included in Appendix A. The intent of the plans was followed during the investigations, to ensure that the subsurface was adequately assessed at the APECs on the Site. Deviations to the plans included:

- PHCs, including benzene, toluene, ethylbenzene and xylenes (BTEX) and fractions F1-F4, were collected at two different depths in MW16-1 and MW16-5, due to high soil moisture content in different soil samples.

- Samples of PHCs (BTEX, fractions F1-F4 and VOCs) were collected in MW16-2 and MW16-3.
- Soil samples were submitted for PAH analysis at two different depths in BH16-4.
- Groundwater could not be collected or analyzed from MW16-1, due to the soil fines in the well clogging the footvalve during purging / sampling activities.

3.5 IMPEDIMENTS

There were no impediments or denial of access that prevented the completion of the original defined scope of the investigation.

4 INVESTIGATION METHOD

4.1 GENERAL

The soil and groundwater quality at the Site was investigated at the locations shown on Figure 2 through the advancement of boreholes and installation of groundwater monitoring wells, to characterize environmental conditions at the APECs identified in the Phase One ESA. Investigation methods followed Standard Operating Procedures (SOPs), prepared by WSP for the conduct of environmental investigations. The investigation methods are described in the following sections.

4.2 DRILLING

WSP retained George Downing Estate Drilling Ltd. (Downing), a MOECC-licensed driller, to conduct the drilling activities at the Site. The drilling program was completed under the supervision of WSP field staff between December 20 and 23, 2016. The boreholes were advanced to evaluate subsurface locations, collect soil samples, and install groundwater monitoring wells at the Site.

The drilling included installation of boreholes MW16-1, MW16-4 and MW16-5 in the southern section and advancement of boreholes MW16-2 and MW16-3 in the northern section of the property (see Figure 2). Boreholes were advanced to assess the soil quality and to determine if there were any impacts as a result of former / present operations on properties located south of the Site. Each of these boreholes were completed with screen lengths of 3.05 m, to determine if contaminants of concern were present in groundwater.

The monitoring wells and details of well installation are presented in **Error! Reference source not found.** below.

Table 2 Details of Well Installations

MW ID	DEPTH OF MW (MBGS)	LENGTH OF SCREEN (M)	SCREENED INTERVAL (MBGS)
MW16-1	14.32	3.05	11.27 to 14.32
MW16-2	14.93	3.05	11.88 to 14.93
MW16-3	15.24	3.05	12.19 to 15.24
MW16-4	16.00	3.05	12.95 to 16.00
MW16-5	14.93	3.05	11.88 to 14.93

Soil samples were recovered from each of the borehole locations, visually inspected and logged. The borehole logs are presented in Appendix B and locations of the boreholes are presented on Figure 2.

4.3 SOIL

4.3.1 SOIL SAMPLING

A 0.61 m stainless steel split spoon soil sampler was used to collect the soil samples from the boreholes.

The geological conditions at the Phase Two Property were observed in the soil samples and recorded on field logs by a WSP technologist. Soil samples were collected with dedicated nitrile gloves to prevent cross contamination between sampling locations. The samples were split into two portions: one portion was placed into labeled polyethylene bags for field screening and another portion was jarred into the appropriate laboratory-supplied sample containers and stored in a cooler with ice for possible laboratory analysis. For samples considered for VOC and PHC fraction F1 analysis, a core of soil was placed in a pre-weighed laboratory, prepared vial containing a measured amount of methanol. Soil samples considered to be representative of "worst-case" environmental conditions were selected for chemical analysis, based on visual and olfactory observations made in the field and vapour readings.

A total of 22 soil samples including four field duplicate samples were submitted to ALS in Ottawa, Ontario. A summary of the soil samples submitted for chemical analysis are summarized in Table 5 to Table 6 (appended).

4.4 FIELD SCREENING MEASUREMENTS

Soil samples were screened using an RKI Eagle 2, which operates as a PID and CGI, to measure total organic vapours and combustible vapours. Results of field screening and the soil samples submitted to the laboratory for chemical analysis are included on the borehole logs (Appendix B).

The PID was equipped with a 10.6 electron-volt (eV) lamp, which was calibrated with a known concentration of isobutylene. This instrument detects VOCs that emit below an ionization potential of 10.6 eV, which includes a wide range of chemicals such as solvents and fuels. The detection limit of the instrument ranges from 0 to 15,000 ppm, and accuracy is +/- 10% for VOCs in the range of 0 and 2,000 ppm and +/- 20% of the reading above 2,000 ppm. The resolution of this instrument is 0.1 ppm for VOCs in the range of 0 and 1,000 ppm and 1 ppm for readings above 1,000 ppm. The PID provides an indication of organic contamination in soil but does not measure concentrations of individual contaminants.

The CGI detects combustible vapours such as those associated with fuels. This instrument measures total combustible gases, calibrated to a known concentration of hexane. The instrument operates in the methane elimination mode. The detection limit of the instrument ranges from 0 to 11,000 ppm (i.e., 100 % LEL of hexane). The CGI has an accuracy of 25 ppm below 1,000 ppm and 5% of the lower explosive limit (LEL) between 1,000 ppm and 100% LEL. As with the PID, it provides an indication of contamination but not chemical specific concentrations.

The instruments were obtained by WSP from Pine Environmental Services Inc. (Pine) for this project. Pine calibrates their instruments on a regular basis, including prior to the use on this project, to ensure consistent results. Site calibration of the field instruments was completed by WSP each day according to the manufacturer's instructions.

4.5 GROUNDWATER: MONITORING WELL INSTALLATION

Five monitoring wells were installed at the Site to investigate the APECs, identified during the Phase One ESA. The monitoring wells were constructed as follows:

- → Each monitoring well was constructed using 31 mm diameter well screens and PVC riser pipe;
- → The screened interval in the monitoring wells was 3.05 m long with a No. 10 slot size screen;

- Sand pack, consisting of No. 2 silica sand, was placed around the well and piezometer screens and the sand pack was extended to a minimum of 0.3 m above the top of the screen;
- A bentonite seal was then placed around the PVC riser pipe up to within 0.3 m of the ground surface; and
- The monitoring wells were completed with flush-mount casings (with the exception of MW16-4, which was a locked monument casing), which were cemented into place.

The monitoring wells were installed by a licensed well technician from Downing in accordance with O. Reg. 903, as amended. The monitoring well construction details are shown on the attached borehole logs (Appendix B).

Following installation of monitoring wells, well development was carried out to remove particulates and fluids that may have collected in the sand pack during drilling activities. The monitoring wells were equipped with dedicated 5/8-inch LDPE Waterra tubing and an inertial pump (footvalve) to facilitate groundwater sampling. The wells were then developed by purging three well volumes or by purging the wells dry three times prior to sampling.

4.6 GROUNDWATER: FIELD MEASUREMENT OF WATER QUALITY PARAMETERS

Following development, groundwater monitoring wells were sampled. Periodic measurements of the groundwater were recorded for temperature, pH, oxidation / reduction potential (ORP), dissolved oxygen (DO), turbidity (NTU) and electrical conductivity (EC), to confirm groundwater conditions were stabilized prior to sampling.

Prior to sampling, the depth to groundwater and depth to the bottom of each well was measured with an oil / water interface probe.

4.7 GROUNDWATER SAMPLING

On December 26, 2016, groundwater samples were collected from wells MW16-2, MW16-3, MW16-4 and MW16-5 with dedicated bailers following purging of the wells. Well MW16-1 was not sampled, as fine-grained material the soil in the well clogged the footvalve during purging on December 23 and December 26, 2016.

Groundwater samples were conveyed directly into laboratory-supplied sample containers. Samples submitted for the analysis of metals. In accordance with O. Reg. 153/04, samples for metals and inorganics (except chloride and free cyanide) analysis were filtered in the field with dedicated 0.45 micron (µm) filters. Groundwater samples were placed in a cooler with ice and a completed chain of custody form for submission to the laboratory.

4.8 SEDIMENT SAMPLING

A water body is not present at the Phase Two Property. Therefore, sediment was not sampled as part of the investigation.

4.9 ANALYTICAL TESTING

Soil and groundwater samples were analyzed by ALS lab, in accordance with the requirements of O. Reg. 153/04.

Soil and groundwater samples were submitted for analysis of MI, VOCs, and PHCs. In addition, soil samples were submitted for the PAH analysis from MW16-4. Laboratory Certificates of Analysis are included in Appendix C.

4.10 RESIDUE MANAGEMENT PROCEDURES

The management of residues such as soil cuttings, purge and development groundwater, and fluids from equipment cleaning was conducted as indicated in the following table.

Table 3 Summary of Residue Management Procedures

RESIDUE	MANAGEMENT PROCEDURE
i. Soil cuttings from drilling and excavations	Soil cuttings from the drilling were drummed and left on-Site.
ii. Water from well development and purging	Groundwater from the development and purging of the monitoring wells was emptied onto the ground adjacent to the wells.
iii. Fluids from equipment cleaning	Equipment cleaning water was emptied into drums and left on-Site.

4.11 ELEVATION SURVEYING

The elevation of the groundwater monitoring wells (ground elevation and top of the PVC pipe) was surveyed by WSP and referenced to the top of the steel grated storm sewer catchbasin, located on the south side of Aylmer Avenue. The top of the cathcbasin is located at the elevation of 72.00 masl, approximately 25 m west of the Aylmer Avenue and Bank Street intersection.

4.12 QUALITY ASSURANCE AND QUALITY CONTROL MEASURES

Quality assurance and quality control of the soil and groundwater water samples was monitored and maintained in a number of ways:

- This field investigation was completed under WSP's SOPs. Deviations from the SOPs are documented and referenced in this report;
- Samples were given unique identifications as they were collected, identifying the project number, date, and sample location and depth. The sample numbers were recorded in field notes for each location;
- Sample containers provided by the laboratory were used and laboratory requirements for sample size, container type, preservatives and filtering were followed;
- Non-disposable sampling equipment was cleaned using Alconox and distilled water following each use;

- A chain-of-custody form was filled out for the samples prior to submitting the samples to the laboratory. The chain-of-custody documented sample movement from collection to receipt at the laboratory and provided sample identification, requested analysis and conditions of samples upon arrival at the laboratory (e.g., temperature, container status, etc.);
- Soil samples were randomly selected by the WSP field staff for duplicate testing. The number of QC samples submitted is equivalent to a minimum of 10% of the total number of samples submitted;
- Field monitoring equipment was calibrated according to industry requirements prior to the site visit including onsite calibration; and
- Samples were randomly selected by the laboratory for Quality Assurance checks. Generally, one sample for every ten samples submitted is checked. For each parameter, there is an acceptable upper and lower limit for the measured concentration of the parameter. Measured concentrations of analysed samples must fall within the upper and lower acceptable limits in order for the sample to be valid. If a result exceeds the upper or lower acceptable limits, the sample must be re-analysed.

5 REVIEW AND EVALUATION

5.1 GEOLOGY

The soil conditions encountered at the Site during the drilling activities are presented on the borehole logs (Appendix B). As can be seen from the logs, a layer of topsoil was encountered at the surface in boreholes MW16-3, MW16-4 and MW16-5. The thickness of the topsoil layer ranges from 130 mm to 180 mm. Silt to sand with some silt fill was encountered in boreholes MW16-1 and MW16-2 below the granular base and below the topsoil in boreholes MW16-3, MW16-4 and MW16-5. The fill layer extends to depths ranging from 3.7 m to 4.9 mbgs.

In borehole MW16-3, a deposit of clayey silt was encountered below the fill layer, extending to a depth of 5.2 mbgs . The clayey silt layer was not encountered in any other boreholes at this Site.

A layer of glacial till was encountered below the clayey silt layer in borehole MW16-3 and below fill in four other boreholes. The glacial till generally consists of a heterogeneous mixture of gravel, cobbles, and boulders, ranging in consistency from sand to silty sand with trace to some clay. The glacial till extends to the depth of auger refusal in the boreholes, ranging from 14.9 to 21.9 mbgs.

Auger refusal was encountered in all boreholes drilled at the site and the depth of the auger refusal ranged from 14.9 m to 16.0 mbgs. Borehole BH16-2 was extended beyond the refusal depth and the bedrock was cored using “N” sized diamond coring equipment, for geotechnical purposes.

5.2 GROUNDWATER: ELEVATIONS AND FLOW DIRECTION

The rationale for choosing locations of monitoring wells was to investigate APECs, identified in the Phase One ESA by WSP. The monitoring wells were designed and installed to intersect the inferred groundwater table.

A groundwater monitoring program was completed by WSP at the Site on December 23 and 26, 2016. Free product or sheen was not observed or measured in the monitoring wells as part of this investigation. The measured water levels ranged from 12.71 to 13.96 mbgs in the wells. This corresponds to groundwater elevations ranging from 58.94 to 61.07 masl.

Based on the measured groundwater elevations, the groundwater flow is interpreted to be to the northeast, towards the Rideau Canal. The groundwater contours were prepared using groundwater elevations at the Site. A plan of shallow groundwater contours is shown on Figure 3.

5.3 SOIL: FIELD SCREENING

CGI and PID readings are shown on the borehole logs (Appendix B) and the results of the readings are summarized below. The purpose of the field screening was to evaluate whether combustible compounds (e.g., PHCs) and VOCs may be present in the recovered samples.

The PID and CGI readings for the soil samples were all not detected or can be read as 1 ppm. The results of the CGI and PID readings were at levels not indicative of gross PHC or VOC contamination.

5.4 SOIL QUALITY

A comparison of the analytical results for soil samples to the Table 2 SCS identified elevated levels of Sodium Absorption Ratio (SAR) at locations MW16-4 and MW16-5 (see Figure 4).

The locations, depths, and type of laboratory analysis of selected soil samples are provided on the borehole logs in Appendix B and are identified in the analytical soil result tables (Tables 5 and 6). The certificates of analysis are presented in Appendix C.

5.4.1 METALS AND INORGANICS

The soil analytical results for metals and inorganics are summarized in Table 5 and presented on Figure 4. A total of six soil samples (including a QA/QC sample) were submitted for the analysis of MI.

- One sample from BH16-4 collected from the depth of 0.83 to 1.37 mbgs had a SAR marginally exceeding the MOECC Table 2 SCS. This sample was collected in the native material, described as silt with trace to some sand.
- One sample from BH16-5 collected from the depth of 0.13 to 0.61 mbgs had a SAR slightly exceeding the MOECC Table 2 SCS. This sample was collected from the silty sand fill layer.

5.4.2 POLYCYCLIC AROMATIC HYDROCARBONS

Three soil samples, including one QA/QC sample, were submitted for the analysis of PAHs. The soil analytical results for PAHs are summarized in Table 5. The results indicated that PAHs were not detected in any of these samples and detection limits were below the Table 2 SCS.

5.4.3 PETROLEUM HYDROCARBONS

The soil analytical results for PHCs are summarized in Table 6. A total of nine soil samples were submitted for the PHC analysis including one QA/QC sample. The results showed that PHCs were not detected in any of these samples and detection limits were below the Table 2 SCS.

5.4.4 VOLATILE ORGANIC COMPOUNDS

A total of six soil samples including one QA/QC sample were submitted for the VOC analysis, and eight samples (including one QA/QC sample) were submitted for the analysis of BTEX. The soil analytical results for VOCs are summarized in Table 6. The results indicated that VOCs were not detected in any of these samples and detection limits were below the Table 2 SCS.

5.5 GROUNDWATER QUALITY

The analytical groundwater results tables are provided in Table 7 and Table 8. The certificate of analysis is presented in Appendix C.

A total of five samples (including one duplicate) were submitted for the analysis of MI, PHC and VOCs.

The results of the groundwater sampling indicated that at each of the sampled wells met the applicable Table 2 SCS.

5.6 QUALITY ASSURANCE AND QUALITY CONTROL RESULTS

ALS completed a variety of QA/QC measures on the soil and groundwater samples submitted as part of this sampling program. These QA/QC measures include: sample replicates, matrix spiked laboratory blanks, and process blanks.

Soil and groundwater samples were randomly selected by the WSP field staff for field duplicate testing. Duplicate samples were selected for every 10 samples submitted for analysis. WSP submitted the following field duplicate soil and groundwater samples:

Soil

- BH16-3 SA102 was a blind field duplicate of BH16-3 SA2 (0.83-1.37 m) and analyzed for MI;
- BH16-5 SA111 was a blind field duplicate of BH16-5 SA11 (7.62-8.23 m) and analyzed for PAHs;
- BH16-5 SA105 was a blind field duplicate of BH16-5 SA5 (3.05-3.66 m) and analyzed for PHCs including BTEX; and,
- BH16-5 SA118 was a blind field duplicate of BH16-5 SA18 (14.46-15.07 m) and analyzed for VOCs.

Groundwater

MW16-105 was a blind field duplicate of MW16-5 and analyzed for MI, PHCs and VOCs.

The results from the duplicate sample was used to assess the accuracy and reliability of the laboratory procedures and instruments.

A calculation of the relative percent difference (RPD) between the sample and its duplicate was performed and compared to the acceptance limits outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, April 2011. The RPD calculation is only applicable when both the sample and the field duplicate concentrations are greater than five times the reported detection limit.

The results are presented in Table 9 and Table 10 for soil and groundwater, respectively. An unacceptable level of agreement between the results of the parent and duplicate samples were identified as follows:

Soil

- Barium and Mercury at BH16-3 SA102 exceeded the RPD criteria of 30%; and,
- Electrical at BH16-3 SA102 exceeded the RPD criteria of 10%.

The elevated RPDs are likely attributed to the heterogeneity within the soil and these deviations from acceptable RPD criteria are not considered indicative of unacceptable data quality.

Groundwater

The RPDs at MW16-105 were less than 5 times the laboratory detection limits and are considered to be acceptable.

5.7 PHASE TWO CONCEPTUAL SITE MODEL

5.7.1 POTENTIALLY CONTAMINATING ACTIVITIES AND AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

Based on the Draft Phase One ESA completed by WSP, there is a potential for soil and groundwater contamination to be present at the Site. Information presented in the report that contributes to the development of the CSM is summarized as follows:

- The Rideau Canal is located approximately 45 m north of the Site, which flows east, turning north approximately 400 m east of the Site towards the Ottawa River;
- Records indicated that 12 wells were used to be located in the Phase One Study Area. Eleven wells were identified as abandoned and one well was identified to be used for water supply;
- Surrounding properties are a mix of residential, commercial and parkland land use;
- Two connected buildings are currently present on the Site which are currently institutional;
- The Site is present at elevation of approximately 72-74 masl and slopes to the north towards the Rideau Canal. The surrounding lands generally slope to the northeast;
- Surficial geology mapping and well records suggest the Site consists of sandy and silty compact diamicton with portions of limestone, dolomite and sandstone outcrops. Bedrock consists of the Middle Ordovican rocks, which include limestone, dolostone, shale, arkose and sandstone. The bedrock typically starts at 9 mbgs in this area;
- Based on the review of records, interviews, and the site reconnaissance completed as part of the Phase One ESA, WSP identified several PCAs for the Phase One ESA Study Area. Based on this, four APECs were identified for the Site. These PCAs (with a PCA code) include:
  - 30. Importation of Fill Material of Unknown Quality;
  - 28. Gasoline and associated products storage in fixed tanks;
  - Other – coal use;
  - 52. Storage, maintenance, fuelling and repair of equipment, vehicles, and material used to maintain transportation systems;
  - 37. Operation of Dry Cleaning Equipment (where chemicals are used); and,
  - 31. Ink Manufacturing, Processing and Bulk Storage.

Information considered for the development of this CSM was gathered from numerous sources (i.e., aerial photographs, city directories, environmental database searches, physical setting sources, historical reports, interviews and a site reconnaissance), which reduces the potential for not identifying a former property use or PCA.

5.7.2 SUBSURFACE UTILITIES

There are no known underground utilities at the Site, affecting the local groundwater flow.

5.7.3 PHYSICAL SETTING

Geological conditions encountered on the Site during the drilling program consist of sand to silty sand fill, underlain by glacial till. The glacial till consists of a heterogeneous mixture of gravel, cobbles, and boulders ranging in consistency from sand to silty sand with trace to some clay. The glacial till extends to the depth of auger refusal in all the boreholes to depths ranging between 14.9 m and 21.9 mbgs.

Bedrock in the area consists of Middle Ordovican rocks, which include limestone, dolostone, shale, arkose and sandstone. The bedrock typically starts at 9 mbgs in this area (Ontario Geological Survey, 2011).

5.7.4 BUILDINGS AND STRUCTURES

There are two connected structures on the Site. These include the main church building, referred to as 'Southminster building', on the east side, and a building used for general church functions / community activities, referred to as 'Southminster Memorial building' on the west side.

5.7.5 ENVIRONMENTALLY SENSITIVE AREAS

There were no conditions on the Site which would apply under Section 41 "Environmentally Sensitive Areas" and Section 43.1 "Shallow Soil Property or lands present within 30 m of a water body" of O. Reg. 153/04.

5.7.6 IMPORTED SOIL

During the Phase Two ESA conducted by WSP, no soil was imported onto the Site.

5.7.7 SOIL AND GROUNDWATER QUALITY

A comparison of analytical results to the MOECC Table 2 SCS for coarse-grained soils identified elevated Sodium Adsorption Ratio for soil samples collected at W16-4 and MW16-5 (see Table 4 and Figure 4):

Table 4 Soil Parameters that Exceed Table 2 SCS

ANALYTICAL SUITE	MW ID / SAMPLE ID	DEPTH INTERVAL (MBGS)	PARAMETER	CONCENTRATION	TABLE 2 SCS
Metals and Inorganics	MW16-4 / SA2	0.8 to 1.4	Sodium Absorption Ratio	**5.42**	5
Metals and Inorganics	MW16-5 / SA1B	0.1 to 0.6	Sodium Absorption Ratio	**5.95**	5

It is interpreted that elevated SAR in surficial soil samples collected at MW16-4 and MW16-5 in the area downgradient to Aylmer Avenue and Bank Street, is due to road salting activities occurring during winter months. According to Section 48 (3) of O. Reg. 153/04, if "an applicable site condition standard is exceeded at the property solely because a substance has been used on a highway for the purpose of keeping the highway safe for traffic under conditions of snow or ice or both, as provided for under section 2 of Regulation 339 of the Revised Regulations of Ontario, 1990 (Classes of Contaminants —

Exemptions), the applicable site condition standard is deemed not to be exceeded for the purpose of Part XV.1 of the Act". Therefore, elevated SAR in soil samples is not considered to be contamination.

The analytical results indicate groundwater samples collected at each of the sampled wells meet the applicable Table 2 SCS.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 SUMMARY OF PHASE TWO FINDINGS

Based on results of the Phase Two ESA, the following conclusions are made:

- The SAR in a soil sample collected at the depth of 0.8 and 1.4 mbgs at MW16-4 was 5.42, marginally exceeding the Table 2 SCS of 5. This sample was collected from the silt fill layer.
- The SAR in a soil sample collected at the depth of 0.1 and 0.6 mbgs at MW16-5 was 5.95, slightly exceeding the Table 2 SCS of 5. This sample was collected from the silty sand fill layer.
- Contaminants were not identified to be present in sampled groundwater at the Site. Groundwater from well MW16-1 was not sampled, as the fine-grained material in the soil clogged the footvalve during purging on December 23 and 26, 2016. Results of the groundwater samples collected from four other wells were found to be below the Table 2 SCS.
- It is interpreted that elevated SAR in surficial soil samples collected at MW16-4 and MW16-5 is related to road salting activities during winter months. According to Section 48(3) of O. Reg. 153/04, this is not considered to be contamination.
- No further contaminant investigations are recommended to be completed to support the land transfer of the west side of the property.

6.2 QUALIFICATIONS OF THE ASSESSORS

The Phase Two ESA was managed and completed by **Ms. Kathryn Maton, C.E.T.**, Environmental Technologist. Kathryn has over seven years of experience in environmental site assessments. She has conducted Phase One and Two Environmental Site Assessments for industrial, commercial and residential properties. In completing this work, she has contributed to identifying, defining and quantifying potential environmental liabilities, to satisfy due diligence and regulatory obligations.

The Phase Two ESA was reviewed by **Ms. Natalia Codoban, M.Eng., P.Eng.,** Hydrogeologist / Environmental Engineer and a Project Manager at WSP. Ms. Codoban has an academic background in Earth / Environmental Sciences and Geology, and Environmental Engineering. She has over twelve years of experience in completing and managing environmental and hydrogeological investigations. Natalia has provided expertise to numerous Contamination Overview Studies and Preliminary Site Screenings, contaminated site assessments (brownfields), environmental investigations, Phase One and Two ESAs, studies for development impact assessment, on-site servicing, watershed studies and water balance evaluation, water resources development and protection, dewatering and hydrogeological projects. Natalia is a QP_{ESA} under O. Reg. 153/04, as amended.

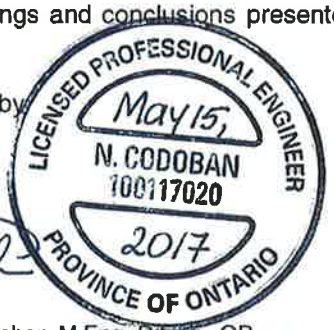
6.3 SIGNATURES

WSP carried out this Phase Two ESA and confirms the findings and conclusions presented in this report.

Report prepared by
WSP Canada Inc.

Kathryn Maton, C.E.T.
Environmental Technologist

Reviewed by

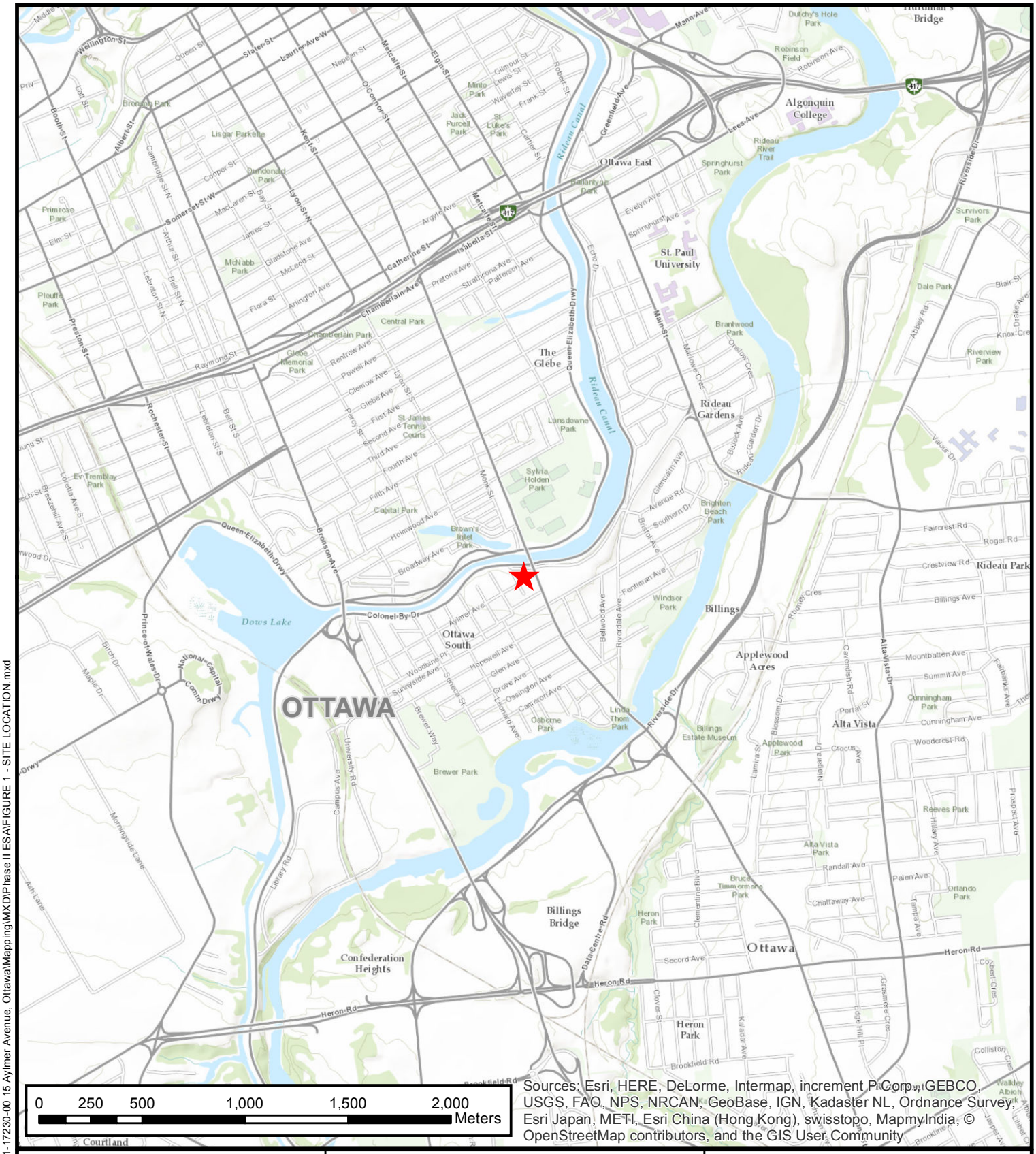


Natalia Codoban, M.Eng, P.Eng., QP$_{ESA}$
Hydrogeologist / Environmental Engineer

7 REFERENCES

- Canadian Standards Association 2006, reaffirmed in 2012. Environmental Site Assessment Guidelines (CZ-768-01, R2012).
- Chapman, L.J. and Putnam, D.F. 2007. Physiography of Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 228, ISBN 978-1-4249-5158-1.
- Gao, C., Shirota, J., Kelly, R. I., Brunton, F.R., van Haaften, S. 2006. Bedrock Topography and Overburden Thickness Mapping, Southern Ontario; Ontario Geological Survey, Miscellaneous Release – Data 207. ISBN 1-4249-2550-9.
- Natural Resources of Canada. December 2016. The Atlas of Canada: Topographic Maps. Map Sheet Number 31G05. Accessed from http://atlas.nrcan.gc.ca.
- Ontario Geological Survey, 2010. Surficial Geology of Southern Ontario; Ontario Geological Survey, Miscellaneous Release Data – 128-REV. 978-1-4435-2482-7 [zip file].
- Ontario Geological Survey 2011. 1:250,000 scale. Bedrock Geology of Ontario; Ontario Geological Survey, Miscellaneous Release – Data 126-Revision 1. ISBN 978-1-4435-5705-4 [zip file].
- Ontario Ministry of Environment and Energy, 1996 (Version 1.1). Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario.
- Ontario Ministry of the Environment, 2011. Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act. April 15.
- Ontario Ministry of the Environment. 2014. Ontario Regulation 153/04, Records of Site Condition – Part XV.1 of the Act. January 1, 2014.
- WSP Canada Inc., February 2, 2017. Draft Phase One Environmental Site Assessment, 1040 BANK STREET, Ottawa, Ontario.

FIGURES



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

WSP

2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ONTARIO,
CANADA, K2B 8K2
WWW.WSPGROUP.COM

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1040 BANK STREET
OTTAWA, ONTARIO
SITE LOCATION PLAN

LEGEND

★ APPROXIMATE SITE LOCATION

Scale	1:25,000
Date	MAY 2017
Drawn By	JS
Job No.	161-17230-00
Drawing No.	FIG. 1

Path: J:\1442 Projects by Job Number\2016\161-17230-00 15 Aylmer Avenue, Ottawa\Mapping\MXD\Phase II ESA\FIGURE 1 - SITE LOCATION.mxd

WSP

2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ONTARIO,
CANADA, K2B 8K2
WWW.WSPGROUP.COM

CLIENT:

WINDMILL DEVELOPMENT GROUP LTD.

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1040 BANK STREET,
OTTAWA, ONTARIO

LEGEND

Site Boundary

Monitoring Well (December, 2016)

PROJECT NUMBER: 161-17230-00	DATE: MAY 2017
DRAWN BY: JS	
CHECKED BY: NC	
SCALE: 1:800	

0 5 10 20 30 40 50 Meters

NAD1983 ZONE 18

TITLE

SITE PLAN AND STUDY AREA

FIGURE 2

Path: J:\1442 Projects by Job Number\2016\161-17230-00 15 Aylmer Avenue, Ottawa\Mapping\MXD\Phase II ESA\FIGURE 2 - SITE PLAN.mxd

WSP

2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ONTARIO,
CANADA, K2B 8K2
WWW.WSPGROUP.COM

CLIENT:

WINDMILL DEVELOPMENT GROUP LTD.

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1040 BANK STREET,
OTTAWA, ONTARIO

LEGEND

- Site Boundary
- Monitoring Well
- Groundwater Contours
- Inferred Groundwater Flow Direction
- (61.07) Groundwater elevations measured in masl on Dec. 26, 2016

PROJECT NUMBER: 161-17230-00	DATE: MAY 2017
DRAWN BY: JS	
CHECKED BY: NC	
SCALE: 1:800	

0 5 10 20 30 40 50 Meters

NAD1983 ZONE 18

TITLE

SHALLOW GROUNDWATER CONTOURS

FIGURE 3

Path: J:\1442 Projects by Job Number\2016\161-17230-00 15 Aylmer Avenue, Ottawa\Mapping\MXD\Phase II ESA\FIGURE 3 - GW CONTOURS.mxd

WSP

2611 QUEENSVIEW DRIVE, SUITE 300
OTTAWA, ONTARIO,
CANADA, K2B 8K2
WWW.WSPGROUP.COM

CLIENT:

WINDMILL DEVELOPMENT GROUP LTD.

PROJECT:

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
1040 BANK STREET,
OTTAWA, ONTARIO

LEGEND

Site Boundary

Monitoring Well

Acroymn	Parameter	Standard
SAR	Sodium Absorption Ratio	5

SAR	5.42	0.83-1.37
Parameter	Concentration	Depth (m)

PROJECT NUMBER: 161-17230-00	DATE: MAY 2017
DRAWN BY: JS	
CHECKED BY: NC	
SCALE: 1:800	

0 5 10 20 30 40 50 Meters

NAD1983 ZONE 18

TITLE

SOIL EXCEEDANCES
METALS AND INORGANICS

FIGURE 4

Path: J:\1442 Projects by Job Number\2016\161-17230-00 15 Aylmer Avenue, Ottawa\Mapping\MXD\Phase II ESA\FIGURE 4 - SOIL EXCEEDANCES_MI.mxd

TABLES

Table 5: Summary of Analytical Results in Soil
Metals and Inorganics and PAHs
1040 Bank Street, Ottawa, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MOECC Table 2 Standards	REPORTING LIMIT	Units	BH16-1 SA1B 0.35-0.61 L1873655 21-Dec-2016	BH16-2 SA1B 0.18-0.61 L1873852 22-Dec-2016	BH16-3 SA2 0.83-1.37 L1873087 20-Dec-2016	BH16-3 SA102 Duplicate of BH16-3 SA2 0.83-1.37 L1873087 20-Dec-2016	BH16-4 SA2 0.83-1.37 L1873655 21-Dec-2016	BH16-5 SA1B 0.13-0.61 L1873087 20-Dec-2016	BH16-5 SA6A 3.81-3.86 L1873853 20-Dec-2016	BH16-5 SA11 7.62-8.23 L1873853 20-Dec-2016	BH16-5 SA111 Duplicate of BH16-5 SA11 7.62-8.23 L1873853 20-Dec-2016
Metals and Inorganics												
Antimony	7.5	1	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA
Arsenic	18	1	ug/g	2.2	4.3	1.2	1.6	<1.0	2.3	NA	NA	NA
Barium	390	1	ug/g	70.8	71.4	64.4	45.1	63.1	60.7	NA	NA	NA
Beryllium	4	0.5	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA	NA	NA
Boron (Hot Water Soluble)	1.5	0.1	ug/g	0.28	0.21	<0.10	<0.10	0.18	0.24	NA	NA	NA
Cadmium	1.2	0.5	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA	NA	NA
Chromium	160	1	ug/g	16.4	21	18.7	21.3	18.9	14.1	NA	NA	NA
Chromium VI	8	0.2	ug/g	<0.20	<0.20	0.62	0.2	<0.20	<0.20	NA	NA	NA
Cobalt	22	1	ug/g	4.8	5.2	5.7	6.2	5.6	4.5	NA	NA	NA
Copper	140	1	ug/g	9.5	8.5	8.8	8.1	6.3	15.7	NA	NA	NA
Lead	120	1	ug/g	30.3	15.7	4.1	6.2	4.8	49.8	NA	NA	NA
Mercury	0.27	0.005	ug/g	0.0281	0.0452	0.0119	0.021	0.0266	0.0746	NA	NA	NA
Molybdenum	6.9	1	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA
Nickel	100	1	ug/g	9.4	10.6	10.9	12.1	9.7	8.1	NA	NA	NA
Selenium	2.4	1	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA
Silver	20	0.2	ug/g	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	NA	NA	NA
Thallium	1	0.5	ug/g	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	NA	NA	NA
Vanadium	86	1	ug/g	29.1	32.2	33.1	34.9	30.6	25.8	NA	NA	NA
Zinc	340	5	ug/g	37.8	34.3	20.6	25.8	34.8	41	NA	NA	NA
pH (pH Units)	5 to 9	0.1	pH	7.63	7.44	7.15	7.29	5.7	7.27	NA	NA	NA
Conductivity (ms/cm)	0.7	0.004	mS/cm	0.414	0.793	0.123	0.142	0.147	0.192	NA	NA	NA
Sodium Absorption Ratio	5	0.1	N/A	8.68	0.35	0.26	0.3	***5.42***	***5.95***	NA	NA	NA
Cyanide, Free	0.051	0.05	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	NA	NA	NA
Boron (Total)	120	5	ug/g	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA	NA
Uranium	23	1	ug/g	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	NA	NA	NA
Polycyclic Aromatic Hydrocarbons (PAHs)												
Acenaphthene	7.9	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Acenaphthylene	0.15	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Anthracene	0.67	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Benzo(a)anthracene	0.5	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Benzo(a)pyrene	0.3	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Benzo(b/j)fluoranthene	0.78	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Benzo(ghi)perylene	6.6	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Benzo(k)fluoranthene	0.78	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Chrysene	7	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Dibenzo(a,h)anthracene	0.1	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Fluoranthene	0.69	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Fluorene	62	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Indeno(1,2,3-cd)pyrene	0.38	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
1-Methylnaphthalene	NV	0.03	ug/g	NA	NA	NA	NA	NA	NA	<0.030	<0.030	<0.030
2-Methylnaphthalene	NV	0.03	ug/g	NA	NA	NA	NA	NA	NA	<0.030	<0.030	<0.030
1,2-Methylnaphthalene	0.99	0.042	ug/g	NA	NA	NA	NA	NA	NA	<0.042	<0.042	<0.042
Naphthalene	0.6	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Phenanthrene	6.2	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050
Pyrene	78	0.05	ug/g	NA	NA	NA	NA	NA	NA	<0.050	<0.050	<0.050

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 2: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential, Parkland, Institutional (RPI) Property Use with coarse textured soils.

100	Exceeds MOECC Standard Value
100	Method Detection Limit Exceeds MOECC Standard

Table 6: Summary of Analytical Results in Soil
PHCs and VOCs
1040 Bank Street, Ottawa, Ontario

Sample ID Depth (m) Lab Job # Sampling Date	MOECC Table 2 Standards	REPORTING LIMIT	Units	BH16-1 SA14 9.90-10.51 L1873655 21-Dec-2016	BH16-1 SA20 14.46-15.07 L1873655 21-Dec-2016	BH16-1 SA21 15.22-15.45 L1873655 21-Dec-2016	BH16-2 SA18 12.94-13.55 L1873852 22-Dec-2016	BH16-2 SA20 14.46-15.07 L1873852 22-Dec-2016	BH16-3 SA19 13.70-14.31 L1873087 20-Dec-2016	BH16-4 SA14 9.90-10.41 L1873655 21-Dec-2016	BH16-4 SA20 14.46-14.69 L1873655 21-Dec-2016	BH16-5 SA5 3.05-3.66 L1873087 20-Dec-2016	BH16-5 SA105 Duplicate of BH16-5 SA5 3.05-3.66 L1873087 20-Dec-2016	BH16-5 SA16 12.94-13.19 L1873087 20-Dec-2016	BH16-5 SA18 14.46-15.07 L1873087 20-Dec-2016	BH16-5 SA118 Duplicate of BH16-5 SA18 14.46-15.07 L1873087 20-Dec-2016
Petroleum Hydrocarbon Compounds (PHCs)																
F1 (C6-C10)	55	5	ug/g	<5.0	<5.0	NA	<5.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA
F1 (C6-C10) - BTEX	55	5	ug/g	<5.0	<5.0	NA	<5.0	NA	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	NA	NA
F2 (C10-C16)	98	10	ug/g	16	<10	NA	<10	NA	<10	<10	<10	<10	<10	<10	NA	NA
F3 (C16-C34)	300	50	ug/g	<50	<50	NA	<50	NA	<50	<50	<50	<50	<50	<50	NA	NA
F4 (C34-C50)	2800	50	ug/g	<50	<50	NA	<50	NA	<50	<50	<50	<50	<50	<50	NA	NA
F4 Gravimetric	2800	72	ug/g	<72	<72	NA	<72	NA	<72	<72	<72	<72	<72	<72	NA	NA
Reached Baseline at C50	NV	NV	NV	Yes	Yes	NA	Yes	NA	Yes	Yes	Yes	Yes	Yes	Yes	NA	NA
Volatile Organic Compounds (VOCs)																
Acetone	16	0.5	ug/g	NA	NA	<0.50	NA	<0.50	<0.50	NA	<0.50	NA	NA	NA	<0.50	<0.50
Benzene	0.21	0.0068	ug/g	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068	<0.0068
Bromodichloromethane	1.5	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Bromoform	0.27	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Bromomethane	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Carbon Tetrachloride	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Chlorobenzene	2.4	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Chloroform	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Dibromochloromethane	2.3	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,2-Dichlorobenzene	1.2	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,3-Dichlorobenzene	4.8	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,4-Dichlorobenzene	0.083	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1-Dichloroethane	0.47	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,2-Dichloroethane	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1-Dichloroethylene	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Cis-1,2-Dichloroethylene	1.9	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Trans-1,2-Dichloroethylene	0.084	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,2-Dichloropropane	0.5	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Cis-1,3-Dichloropropylene	NV	0.03	ug/g	NA	NA	<0.030	NA	<0.030	<0.030	NA	<0.030	NA	NA	NA	<0.030	<0.030
Trans-1,3-Dichloropropylene	NV	0.03	ug/g	NA	NA	<0.030	NA	<0.030	<0.030	NA	<0.030	NA	NA	NA	<0.030	<0.030
1,3-Dichloropropylene	0.05	0.042	ug/g	NA	NA	<0.042	NA	<0.042	<0.042	NA	<0.042	NA	NA	NA	<0.042	<0.042
Ethylbenzene	1.1	0.018	ug/g	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018	<0.018
Ethylene Dibromide	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Methyl Ethyl Ketone	16	0.5	ug/g	NA	NA	<0.50	NA	<0.50	<0.50	NA	<0.50	NA	NA	NA	<0.50	<0.50
Methylene Chloride	0.1	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Methyl Isobutyl Ketone	1.7	0.5	ug/g	NA	NA	<0.50	NA	<0.50	<0.50	NA	<0.50	NA	NA	NA	<0.50	<0.50
Methyl-t-Butyl Ether	0.75	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Styrene	0.7	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1,1,2-Tetrachloroethane	0.058	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1,2,2-Tetrachloroethane	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Toluene	2.3	0.08	ug/g	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
Tetrachloroethylene	0.28	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1,1-Trichloroethane	0.38	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
1,1,2-Trichloroethane	0.05	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Trichloroethylene	0.061	0.01	ug/g	NA	NA	<0.010	NA	<0.010	<0.010	NA	<0.010	NA	NA	NA	<0.010	<0.010
Vinyl Chloride	0.02	0.02	ug/g	NA	NA	<0.020	NA	<0.020	<0.020	NA	<0.020	NA	NA	NA	<0.020	<0.020
m-Xylene & p-Xylene	NV	0.03	ug/g	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
o-Xylene	NV	0.02	ug/g	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Total Xylenes	3.1	0.05	ug/g	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Dichlorodifluoromethane	16	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050
Hexane(n)	2.8	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	0.057
Trichlorofluoromethane	4	0.05	ug/g	NA	NA	<0.050	NA	<0.050	<0.050	NA	<0.050	NA	NA	NA	<0.050	<0.050

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 2: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential, Parkland, Institutional (RPI) Property Use with coarse textured soils.

100	Exceeds MOECC Standard Value
100	Method Detection Limit Exceeds MOECC Standard

Table 7: Summary of Analytical Results in Groundwater
Metals and Inorganics
1040 Bank Street, Ottawa, Ontario

Sample ID Lab Job # Sampling Date	MOECC Table 2 Standards	REPORTING LIMIT	Units	MW16-2 L1874349 26-Dec-2016	MW16-3 L1874349 26-Dec-2016	MW16-4 L1874349 26-Dec-2016	MW16-5 L1874349 26-Dec-2016	MW16-105 Duplicate of MW16-5 L1874349 26-Dec-2016
Metals and Inorganics								
Antimony	6	0.1	ug/L	0.13	0.12	<0.10	<0.10	<0.10
Arsenic	25	0.1	ug/L	0.11	0.13	0.11	0.14	0.12
Barium	1000	0.1	ug/L	84.7	82	83.2	114	111
Beryllium	4	0.1	ug/L	<0.10	<0.10	<0.10	<0.10	<0.10
Boron (Total)	5000	10	ug/L	29	28	74	77	76
Cadmium	2.7	0.01	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010
Chromium	50	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chromium VI	25	1	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Cobalt	3.8	0.1	ug/L	0.19	0.21	0.58	0.6	0.57
Copper	87	0.2	ug/L	1.06	0.96	0.99	0.85	0.8
Lead	10	0.05	ug/L	<0.050	<0.050	<0.050	0.065	<0.050
Mercury	0.29	0.01	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010
Molybdenum	70	0.05	ug/L	5.58	2.07	1.23	3.35	3.4
Nickel	100	0.5	ug/L	0.93	0.99	1.03	1.49	1.53
Selenium	10	0.05	ug/L	0.594	0.139	0.362	0.397	0.407
Silver	1.5	0.05	ug/L	<0.050	<0.050	<0.050	<0.050	<0.050
Thallium	2	0.01	ug/L	0.011	<0.010	<0.010	0.011	<0.010
Vanadium	6.2	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Zinc	1100	1	ug/L	1.5	1.5	<1.0	<1.0	<1.0
pH (pH Units)	5 to 9	0.1	pH	7.88	7.92	7.8	7.69	7.72
Conductivity (ms/cm)	NV	0.003	mS/cm	0.986	0.889	0.936	1.14	1.13
Cyanide, Free	66	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Sodium	490000	500	ug/L	93300	85700	86900	108000	108000
Chloride	790	0.5	mg/L	152	117	122	175	180
Uranium	20	0.01	ug/L	0.798	0.787	0.765	0.859	0.844

Notes:

'NV ' : No Standard established NA: Parameter not analyzed

MOECC Table 2: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for All Types of Property Use with coarse textured soils.

100	Exceeds MOECC Standard Value
100	Method Detection Limit Exceeds MOECC Standard

Table 8: Summary of Analytical Results in Groundwater
PHCs and VOCs
1040 Bank Street, Ottawa, Ontario

Sample ID Lab Job # Sampling Date	MOECC Table 2 Standards	REPORTING LIMIT	Units	MW16-2 L1874349 26-Dec-2016	MW16-3 L1874349 26-Dec-2016	MW16-4 L1874349 26-Dec-2016	MW16-5 L1874349 26-Dec-2016	MW16-105 Duplicate of MW16-5 L1874349 26-Dec-2016
Petroleum Hydrocarbon Compounds (PHCs)								
F1 (C6-C10)	750	25	ug/L	<25	<25	<25	<25	<25
F1 (C6-C10) - BTEX	750	25	ug/L	<25	<25	<25	<25	<25
F2 (C10-C16)	150	100	ug/L	<100	<100	<100	<100	<100
F3 (C16-C34)	500	250	ug/L	<250	<250	<250	<250	<250
F4 (C34-C50)	500	250	ug/L	<250	<250	<250	<250	<250
F4 Gravimetric	500	370	ug/L	<370	<370	<370	<370	<370
Reached Baseline at C50	NV	NV	NV	Yes	Yes	Yes	Yes	Yes
Volatile Organic Compounds (VOCs)								
Acetone	2700	30	ug/L	<30	<30	<30	<30	<30
Benzene	5	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	16	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Bromoform	25	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Bromomethane	0.89	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Carbon Tetrachloride	0.79	0.2	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	30	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Chloroform	2.4	1	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	25	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
1,2-Dichlorobenzene	3	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	59	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	1	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethane	5	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloroethane	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Cis-1,2-Dichloroethylene	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Trans-1,2-Dichloroethylene	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,2-Dichloropropane	5	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Cis-1,3-Dichloropropylene	NV	0.3	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30
Trans-1,3-Dichloropropylene	NV	0.3	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-Dichloropropylene	0.5	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylbenzene	2.4	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Ethylene Dibromide	0.2	0.2	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Ethyl Ketone	1800	20	ug/L	<20	<20	<20	<20	<20
Methylene Chloride	50	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	640	20	ug/L	<20	<20	<20	<20	<20
Methyl-t-Butyl Ether	15	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Styrene	5.4	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	1.1	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	1	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Toluene	24	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Tetrachloroethylene	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,1-Trichloroethane	200	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	4.7	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Trichloroethylene	1.6	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
Vinyl Chloride	0.5	0.5	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50
m-Xylene & p-Xylene	NV	0.4	ug/L	0.58	<0.40	<0.40	<0.40	<0.40
o-Xylene	NV	0.3	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30
Total Xylenes	300	0.5	ug/L	0.58	<0.50	<0.50	<0.50	<0.50
Dichlorodifluoromethane	590	2	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0
Hexane(n)	51	0.5	ug/L	0.88	<0.50	<0.50	<0.50	<0.50
Trichlorofluoromethane	150	5	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0

Notes:
'NV ' : No Standard established NA: Parameter not analyzed
MOECC Table 2: Ontario Ministry of the Environment, "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, " March 2004, amended July 1, 2011. Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for All Types of Property Use with coarse textured soils.

100	Exceeds MOECC Standard Value
100	Method Detection Limit Exceeds MOECC Standard

Table 9: Summary of Relative Percent Differences (RPDs) in Soil
1040 Bank Street, Ottawa, Ontario

Parameter	MOECC Alert Criteria	RPD	Sample(1)	Duplicate	% Difference
			BH16-3 SA2	BH16-3 SA102	
Metals and Inorganics					
Antimony	30%	1	<1.0	<1.0	-
Arsenic	30%	1	1.2	1.6	28.6%
Barium	30%	1	64.4	45.1	**35.3%**
Beryllium	30%	0.5	<0.50	<0.50	-
Boron (Hot Water Soluble)	40%	0.1	<0.10	<0.10	-
Cadmium	30%	0.5	<0.50	<0.50	-
Chromium	30%	1	18.7	21.3	13.0%
Chromium VI	35%	0.2	0.62	0.2	-
Cobalt	30%	1	5.7	6.2	8.4%
Copper	30%	1	8.8	8.1	8.3%
Lead	30%	1	4.1	6.2	**40.8%**
Mercury	30%	0.005	0.0119	0.021	**55.3%**
Molybdenum	30%	1	<1.0	<1.0	-
Nickel	30%	1	10.9	12.1	10.4%
Selenium	30%	1	<1.0	<1.0	-
Silver	30%	0.2	<0.20	<0.20	-
Thallium	30%	0.5	<0.50	<0.50	-
Vanadium	30%	1	33.1	34.9	5.3%
Zinc	30%	5	20.6	25.8	22.4%
pH (pH Units)	0.3	0.1	7.15	7.29	0.02
Conductivity (ms/cm)	10%	0.004	0.123	0.142	**14.3%**
Sodium Absorption Ratio	30%	0.1	0.26	0.3	14.3%
Cyanide, Free	35%	0.05	<0.050	<0.050	-
Boron (Total)	30%	5	<5.0	<5.0	-
Uranium	30%	1	<1.0	<1.0	-

Parameter	MOECC Alert Criteria	RPD	Sample(1)	Duplicate	% Difference
			BH16-5 SA11	BH16-5 SA111	
PAHs					
Acenaphthene	40%	0.05	<0.050	<0.050	-
Acenaphthylene	40%	0.05	<0.050	<0.050	-
Anthracene	40%	0.05	<0.050	<0.050	-
Benzo(a)anthracene	40%	0.05	<0.050	<0.050	-
Benzo(a)pyrene	40%	0.05	<0.050	<0.050	-
Benzo(b/j)fluoranthene	40%	0.05	<0.050	<0.050	-
Benzo(ghi)perylene	40%	0.05	<0.050	<0.050	-
Benzo(k)fluoranthene	40%	0.05	<0.050	<0.050	-
Chrysene	40%	0.05	<0.050	<0.050	-
Dibenzo(a,h)anthracene	40%	0.05	<0.050	<0.050	-
Fluoranthene	40%	0.05	<0.050	<0.050	-
Fluorene	40%	0.05	<0.050	<0.050	-
Indeno(1,2,3-cd)pyrene	40%	0.05	<0.050	<0.050	-
1-Methylnaphthalene	40%	0.03	<0.030	<0.030	-
2-Methylnaphthalene	40%	0.03	<0.030	<0.030	-
1-, 2-Methylnaphthalene	40%	0.042	<0.042	<0.042	-
Naphthalene	40%	0.05	<0.050	<0.050	-
Phenanthrene	40%	0.05	<0.050	<0.050	-
Pyrene	40%	0.05	<0.050	<0.050	-

Parameter	MOECC Alert Criteria	RPD	Sample(1)	Duplicate	% Difference
			BH16-5 SA5	BH16-5 SA105	
BTEX and PHCs					
F1 (C6-C10)	30%	5	<5.0	<5.0	-
F1 (C6-C10) - BTEX	30%	5	<5.0	<5.0	-
F2 (C10-C16)	30%	10	<10	<10	-
F3 (C16-C34)	30%	50	<50	<50	-
F4 (C34-C50)	30%	50	<50	<50	-

Parameter	MOECC Alert Criteria	RPD	Sample(1)	Duplicate	% Difference
			BH16-5 SA18	BH16-5 SA118	
VOCs					
Acetone	50%	0.5	<0.50	<0.50	-
Benzene	50%	0.0068	<0.0068	<0.0068	-
Bromodichloromethane	50%	0.05	<0.050	<0.050	-
Bromoform	50%	0.05	<0.050	<0.050	-
Bromomethane	50%	0.05	<0.050	<0.050	-
Carbon Tetrachloride	50%	0.05	<0.050	<0.050	-
Chlorobenzene	50%	0.05	<0.050	<0.050	-
Chloroform	50%	0.05	<0.050	<0.050	-
Dibromochloromethane	50%	0.05	<0.050	<0.050	-
1,2-Dichlorobenzene	50%	0.05	<0.050	<0.050	-
1,3-Dichlorobenzene	50%	0.05	<0.050	<0.050	-
1,4-Dichlorobenzene	50%	0.05	<0.050	<0.050	-
1,1-Dichloroethane	50%	0.05	<0.050	<0.050	-
1,2-Dichloroethane	50%	0.05	<0.050	<0.050	-
1,1-Dichloroethylene	50%	0.05	<0.050	<0.050	-
Cis-1,2-Dichloroethylene	50%	0.05	<0.050	<0.050	-
Trans-1,2-Dichloroethylene	50%	0.05	<0.050	<0.050	-
1,2-Dichloropropane	50%	0.05	<0.050	<0.050	-
Cis-1,3-Dichloropropylene	50%	0.03	<0.030	<0.030	-
Trans-1,3-Dichloropropylene	50%	0.03	<0.030	<0.030	-
1,3-Dichloropropylene	50%	0.042	<0.042	<0.042	-
Ethylbenzene	50%	0.018	<0.018	<0.018	-
Ethylene Dibromide	50%	0.05	<0.050	<0.050	-
Methyl Ethyl Ketone	50%	0.5	<0.50	<0.50	-
Methylene Chloride	50%	0.05	<0.050	<0.050	-
Methyl Isobutyl Ketone	50%	0.5	<0.50	<0.50	-
Methyl-t-Butyl Ether	50%	0.05	<0.050	<0.050	-
Styrene	50%	0.05	<0.050	<0.050	-
1,1,1,2-Tetrachloroethane	50%	0.05	<0.050	<0.050	-
1,1,2,2-Tetrachloroethane	50%	0.05	<0.050	<0.050	-
Toluene	50%	0.08	<0.080	<0.080	-
Tetrachloroethylene	50%	0.05	<0.050	<0.050	-
1,1,1-Trichloroethane	50%	0.05	<0.050	<0.050	-
1,1,2-Trichloroethane	50%	0.05	<0.050	<0.050	-
Trichloroethylene	50%	0.01	<0.010	<0.010	-
Vinyl Chloride	50%	0.02	<0.020	<0.020	-
m-Xylene & p-Xylene	50%	0.03	<0.030	<0.030	-
o-Xylene	50%	0.02	<0.020	<0.020	-
Total Xylenes	50%	0.05	<0.050	<0.050	-
Dichlorodifluoromethane	50%	0.05	<0.050	<0.050	-
Hexane(n)	50%	0.05	<0.050	0.057	-
Trichlorofluoromethane	50%	0.05	<0.050	<0.050	-

Notes:

(1)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated
40.5%	RPD exceeds MOECC Alert Criteria

Table 10: Summary of Relative Percent Differences (RPDs) in Groundwater
1040 Bank Street, Ottawa, Ontario

Parameter	MOECC Alert Criteria	RPD	Sample[(1)]	Duplicate	% Difference
			MW16-5	MW16-105	
Metals and Inorganics					
Antimony	20%	0.1	<0.10	<0.10	-
Arsenic	20%	0.1	0.14	0.12	15.4%
Barium	20%	0.1	114	111	2.7%
Beryllium	20%	0.1	<0.10	<0.10	-
Boron (Total)	20%	10	77	76	1.3%
Cadmium	20%	0.01	<0.010	<0.010	-
Chromium	20%	0.5	<0.50	<0.50	-
Chromium VI	20%	1	<1.0	<1.0	-
Cobalt	20%	0.1	0.6	0.57	5.1%
Copper	20%	0.2	0.85	0.8	6.1%
Lead	20%	0.05	0.065	<0.050	-
Mercury	20%	0.01	<0.010	<0.010	-
Molybdenum	20%	0.05	3.35	3.4	1.5%
Nickel	20%	0.5	1.49	1.53	2.6%
Selenium	20%	0.05	0.397	0.407	2.5%
Silver	20%	0.05	<0.050	<0.050	-
Thallium	20%	0.01	0.011	<0.010	-
Vanadium	20%	0.5	<0.50	<0.50	-
Zinc	20%	1	<1.0	<1.0	-
pH (pH Units)	0.3	0.1	7.69	7.72	0.004
Conductivity (ms/cm)	10%	0.003	1.14	1.13	0.9%
Cyanide, Free	20%	2	<2.0	<2.0	-
Sodium	20%	500	108000	108000	0.0%
Chloride	20%	0.5	175	180	2.8%
Uranium	20%	0.01	0.859	0.844	1.8%

Parameter	MOECC Alert Criteria	RPD	Sample[(1)]	Duplicate	% Difference
			MW16-5	MW16-105	
PHCs					
F1 (C6-C10)	30%	25	<25	<25	-
F1 (C6-C10) - BTEX	30%	25	<25	<25	-
F2 (C10-C16)	30%	100	<100	<100	-
F3 (C16-C34)	30%	250	<250	<250	-
F4 (C34-C50)	30%	250	<250	<250	-
F4 Gravimetric	30%	370	<370	<370	-

Parameter	MOECC Alert Criteria	RPD	Sample[(1)]	Duplicate	% Difference
			MW16-5	MW16-105	
VOCs					
Acetone	30%	30	<30	<30	-
Benzene	30%	0.5	<0.50	<0.50	-
Bromodichloromethane	30%	2	<2.0	<2.0	-
Bromoform	30%	5	<5.0	<5.0	-
Bromomethane	30%	0.5	<0.50	<0.50	-
Carbon Tetrachloride	30%	0.2	<0.20	<0.20	-
Chlorobenzene	30%	0.5	<0.50	<0.50	-
Chloroform	30%	1	<1.0	<1.0	-
Dibromochloromethane	30%	2	<2.0	<2.0	-
1,2-Dichlorobenzene	30%	0.5	<0.50	<0.50	-
1,3-Dichlorobenzene	30%	0.5	<0.50	<0.50	-
1,4-Dichlorobenzene	30%	0.5	<0.50	<0.50	-
1,1-Dichloroethane	30%	0.5	<0.50	<0.50	-
1,2-Dichloroethane	30%	0.5	<0.50	<0.50	-
1,1-Dichloroethylene	30%	0.5	<0.50	<0.50	-
Cis-1,2-Dichloroethylene	30%	0.5	<0.50	<0.50	-
Trans-1,2-Dichloroethylene	30%	0.5	<0.50	<0.50	-
1,2-Dichloropropane	30%	0.5	<0.50	<0.50	-
Cis-1,3-Dichloropropylene	30%	0.3	<0.30	<0.30	-
Trans-1,3-Dichloropropylene	30%	0.3	<0.30	<0.30	-
1,3-Dichloropropylene	30%	0.5	<0.50	<0.50	-
Ethylbenzene	30%	0.5	<0.50	<0.50	-
Ethylene Dibromide	30%	0.2	<0.20	<0.20	-
Methyl Ethyl Ketone	30%	20	<20	<20	-
Methylene Chloride	30%	5	<5.0	<5.0	-
Methyl Isobutyl Ketone	30%	20	<20	<20	-
Methyl-t-Butyl Ether	30%	2	<2.0	<2.0	-
Styrene	30%	0.5	<0.50	<0.50	-
1,1,1,2-Tetrachloroethane	30%	0.5	<0.50	<0.50	-
1,1,2,2-Tetrachloroethane	30%	0.5	<0.50	<0.50	-
Toluene	30%	0.5	<0.50	<0.50	-
Tetrachloroethylene	30%	0.5	<0.50	<0.50	-
1,1,1-Trichloroethane	30%	0.5	<0.50	<0.50	-
1,1,2-Trichloroethane	30%	0.5	<0.50	<0.50	-
Trichloroethylene	30%	0.5	<0.50	<0.50	-
Vinyl Chloride	30%	0.5	<0.50	<0.50	-
m-Xylene & p-Xylene	30%	0.4	<0.40	<0.40	-
o-Xylene	30%	0.3	<0.30	<0.30	-
Total Xylenes	30%	0.5	<0.50	<0.50	-
Dichlorodifluoromethane	30%	2	<2.0	<2.0	-
Hexane(n)	30%	0.5	<0.50	<0.50	-
Trichlorofluoromethane	30%	5	<5.0	<5.0	-

Notes:

(1)	All results reported in micrograms per gram (µg/g) unless otherwise noted.
<	Parameter not detected above value specified
% Difference	Relative Percent Difference = |(X-Y)/Average(X,Y)| x 100% where X is the sample and Y is the duplicate
-	RPD could not be calculated
40.5%	RPD exceeds MOECC Alert Criteria

Appendix A

SAMPLE AND ANALYSIS PLAN

Soil					
Sample Location	**Proposed Borehole Depth (mbgs)**	**Reg 153 Metals and Inorganics**	**Reg 153 VOCs**	**Reg 153 PHCs: F1-F4 and BTEX**	**Reg 153 PAHs**
MW-1	15	1	1	1	
MW-2	15	1			
MW-3	15	1			
MW-4	15	1	1	1	
MW-5	15	1	1	1	2
Blind Field Duplicates		**1**	**1**	**1**	**1**
TOTALS		**6**	**4**	**4**	**3**

Notes:

*VOC and PHC F1-BTEX samples to be placed directly into vials with preservative or using hermetic core.

*Collect PHC F1-F4 at the water table (if no visual evidence)

*Collect VOC at the bottom of the borehole (if no visual evidence)

*Collect Metals and Inorganics in the fill material in each borehole (BH16-1 should be at surface for de-icing operations)

Sample Location	Groundwater				Environmental Investigation Notes
	Proposed Monitoring Well Depth	Reg 153 Metals and Inorganics	Reg 153 VOCs	Reg 153 PHC F1-F4	
MW-1	15	1	1	1	Take headspace vapour readings before purging and collecting samples
MW-2	15	1	1	1	
MW-3	15	1	1	1	
MW-4	15	1	1	1	
MW-5	15	1	1	1	
Blind Field Duplicates		1	1	1	
Trip Blank			1		
TOTALS		6	7	6	

* Parameters in select wells may change based on results of soil quality analysis results

Appendix B

BOREHOLE LOGS

MONITORING WELL DRILLING RECORD : **BH/MH16-1**

Prepared by: **Kathryn Maton** Date (Start): **12/21/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/21/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446364 mE
Y = 5027094 mN
Surface Elevation: 73.78 m *(Geodetic)*
Top of PVC Elevation: 73.67 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

Water Level ▽ Free Phase

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

DEPTH ELEVATION (m)	GEOLOGY / LITHOLOGY: LITHOLOGY	GEOLOGY / LITHOLOGY: DESCRIPTION	OBSERVATIONS: VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	OBSERVATIONS: ODOUR F M P	OBSERVATIONS: VISUAL D S	SAMPLES: SAMPLE TYPE	SAMPLES: % RECOVERY	SAMPLES: N (Blow/6")	SAMPLES: NUMBER	SAMPLES: ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
		Ground surface.												
73.76 / 0.00		**Asphalt - 20 mm**	H - 0, I - 0			SS	58	11 8 4 5	SA1A	Metals and Inorganics			← Bentonite	
73.43 / 0.35		**Gravel** some sand to sandy, moist, brown (Granular Base)	H - 0, I - 0						SA1B					
		- trace roots 0.4 m to 0.6 m	H - 0, I - 0			SS	33	4 3 28 2	SA2					
		Sand some silt, trace gravel, trace roots, brown, moist, loose (FILL)												
72.06 / 1.72		*- trace gravel below 0.6 m in depth*	H - 0, I - 0			SS	50	6 3 3 4	SA3A					
		Sand, some silt, brown, trace gravel, moist, loose (FILL)	H - 0, I - 0						SA3B					
		- brick fragment observed at approximatly 2.74 m in depth	H - 0, I - 0			SS	33	5 3 2 5	SA4					
			H - 0, I - 0			SS	62	4 3 13 2	SA5					
69.21 / 4.57			H - 0, I - 0			SS	58	5 3 5 7	SA6					
		Sand, trace silt, brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	64	8 7 11 15	SA7				← Sand	
			H - 0, I - 0			SS	62	8 12 13 15	SA8					
			H - 0, I - 0			SS	71	4 8 11 11	SA9					
			H - 0, I - 0			SS	71	8 11 12 14	SA10					
			H - 0, I - 0			SS	71	5 9 10 14	SA11					
65.40 / 8.38		**Sand and Gravel** trace silt, grey, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	12	13 38 42 24	SA12					
			H - 0, I - 0			SS	0	18 39 43 16	SA13					
9.90														

MONITORING WELL DRILLING RECORD : **BH/MH16-1**

Prepared by: **Kathryn Maton** Date (Start): **12/21/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/21/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446364 mE
Y = 5027094 mN
Surface Elevation: 73.78 m *(Geodetic)*
Top of PVC Elevation: 73.67 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatile Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
63.88		**Sand** some gravel, some silt, trace clay, brown, wet, compact (GLACIAL TILL)	H - 0, I - 0			SS	33	8 5 10 12	SA14	PH F_1-F_4 BTEX			Bentonite	
		- very dense below 10.7 m in depth	H - 0, I - 0			SS	62	4 5 49 50-3"	SA15A					
			H - 0, I - 0						SA15B					
			H - 0, I - 0			SS	10	37 50-2"	SA16				PVC Slotted Pipe	
12.19 *61.59*		**Gravel** some sand, some silt, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	46	18 34 27 44	SA17			▽	Sand SCREEN Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m WATER Depth: 12.60 m Elev.: 61.07 m Date: 12/26/2016	
			H - 0, I - 0			SS	50	23 25 56 35	SA18					
			H - 0, I - 0			SS	58	12 28 50 29	SA19					
14.48 *59.30*		**Sand and Gravel** trace silt, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	46	49 32 40 55	SA20	PH F_1-F_4 BTEX				
			H - 0, I - 0			SS	25	14 50-3"	SA21	VOC				
15.67 *58.11*		***END OF BOREHOLE***												
		Notes *1) Auger refusal at 15.7 m below the existing ground surface* *2) 50 mm monitoring well installed at 14.5 m below the existing ground surface* *3) Date Groundwater Depth* *12/26/2016 12.7 mbgs* End of borehole at 15.67 m.												

Projet : BH LOGS - 161-17230-00 -15 AYLMER AVENUE, OTTAWA, ONTARIO.GPJ Type rapport : WSP_EN_WELL-ENVIRONMENTAL Data Template : WSP_TEMPLATE_GEOTECH.GDT 5/16/2017

MONITORING WELL DRILLING RECORD : **BH/MW16-2**

Prepared by: **Kathryn Maton** Date (Start): **12/22/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/23/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446357 mE
Y = 5027121 mN
Surface Elevation: 72.35 m *(Geodetic)*
Top of PVC Elevation: 72.25 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger / NQ Casing
Borehole Diameter: 203 mm
Drilling Fluid: Water
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH / ELEVATION (m)	GEOLOGY / LITHOLOGY: LITHOLOGY	GEOLOGY / LITHOLOGY: DESCRIPTION	OBSERVATIONS: VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	OBSERVATIONS: ODOUR F M P	OBSERVATIONS: VISUAL D S	SAMPLES: SAMPLE TYPE	SAMPLES: % RECOVERY	SAMPLES: N (Blow/6")	SAMPLES: NUMBER	SAMPLES: ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
		Ground surface.												
0.00 / 0.18 / 72.17		**Asphalt - 50 mm**	H - 0, I - 0			SS	66	34 14 9 3	SA1A	Metals and Inorganics			Sand	
0.5		**Gravel** some sand to sandy, moist, grey brown (Granular Base)	H - 0, I - 0						SA1B					0.5
1.0		**SANDY SILT** brown, moist, loose to compact (FILL)	H - 0, I - 0			SS	66	6 4 6 7	SA2				Bentonite	1.0
1.52 / 70.83														
1.5		**SAND** trace to some silt, trace to some clay, brown, moist, loose (FILL)	H - 0, I - 0			SS	66	4 3 4 4	SA3					1.5
2.11 / 70.24														
2.0		**SAND** trace silt, brown, moist, loose (FILL)	H - 0, I - 0			SS	56	3 4 5 4	SA4					2.0
2.5														2.5
3.0			H - 0, I - 0			SS	54	2 3 2 3	SA5					3.0
3.5														3.5
3.66 / 68.69														
4.0		**SAND** brown, moist, loose to compact (GLACIAL TILL)	H - 0, I - 0			SS	60	5 5 6 7	SA6					4.0
4.5														4.5
5.0			H - 0, I - 0			SS	54	2 3 4 5	SA7					5.0
5.5			H - 0, I - 0			SS	66	4 6 8 12	SA8					5.5
6.10 / 66.25													Sand	
6.5		**SAND** some gravel, brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	66	4 9 11 11	SA9					6.5
6.71 / 65.64														
7.0		**SAND** some gravel, trace silt, brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	64	7 11 17 18	SA10					7.0
7.5														7.5
8.0			H - 0, I - 0			SS	62	9 12 15 13	SA11					8.0
8.40 / 63.95														
8.5		**SILTY SAND** trace to some gravel, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	58	12 27 50-5"	SA12					8.5
9.0														9.0
9.5			H - 0, I - 0			SS	16	50-5"	SA13					9.5
9.90														
10.0														10.0

MONITORING WELL DRILLING RECORD : **BH/MW16-2**

Prepared by: **Kathryn Maton** Date (Start): **12/22/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/23/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446357 mE, Y = 5027121 mN
Surface Elevation: 72.35 m *(Geodetic)*
Top of PVC Elevation: 72.25 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger / NQ Casing
Borehole Diameter: 203 mm
Drilling Fluid: Water
Sampling Method: Split Spoon

ODOUR: F - Light; M - Medium; P - Persistent
VISUAL: D - Disseminated Product; S - Saturated with Product

SAMPLE TYPE: DC - Diamond Corer; SS - Split Spoon; MA - Manual Auger; DP - Direct Push; ST - Shelby Tube; TU - DT32 Liner; MC - Macro Core Liner

CHEMICAL ANALYSIS: PCB Poly-Chlorinated Biphenyls; BTEX Benzene, Toluene, Ethylbenzene, Xylene; Inorganics Inorganic Compounds; Phenol. C. Phenolic Compounds; VOC Volatil Organic Compounds (MAH & CAH); Diox. & Fur. Dioxins & Furans; CAH Chlorinated Aliphatic Hydrocarbons; SVOC Semi Volatile Organic Compounds; PAH Polycyclic Aromatic Hydrocarbons; PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}; PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50}); Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.; HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH / ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	MONITORING WELL DIAGRAM	MONITORING WELL DESCRIPTION	REMARKS
62.45		**SAND** some gravel, trace silt, brown, moist, dense (GLACIAL TILL)	H - 0, I - 0			SS	54	28 20 22 32	SA14					
10.66														
61.69		**GRAVELLY SAND** some silt, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	50	5 36 49 42	SA15				Bentonite	
			H - 0, I - 0			SS	50	23 37 50-3"	SA16					
		- becoming wet at 12.8 m in depth	H - 0, I - 0			SS	29	27 50-3"	SA17			▽		
			H - 0, I - 0			SS	60	31 55 47 32	SA18	PH F_1-F_4 BTEX			Sand SCREEN; PVC Slotted Pipe Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m; WATER Depth: 12.88 m Elev.: 59.37 m Date: 12/26/2016	
13.70														
58.65		**SAND** with trace to some gravel, brown, wet, very dense (GLACIAL TILL)	H - 0, I - 0			SS	41	22 12 50-5"	SA19					
			H - 0, I - 0			SS	54	6 10 27 50-2"	SA20	VOC				
15.16														
57.19		**COBBLES AND BOULDERS** (GLACIAL TILL)	H - 0, I - 0			DC			C1					
			H - 0, I - 0			DC			C2					
			H - 0, I - 0			DC		(18.21-21.94)						

Projet : BH LOGS - 161-17230-00 -15 AYLMER AVENUE, OTTAWA, ONTARIO.GPJ Type rapport : WSP_EN_WELL-ENVIRONMENTAL Data Template : WSP_TEMPLATE_GEOTECH.GDT 5/16/2017

MONITORING WELL DRILLING RECORD : **BH/MW16-2**

Prepared by: **Kathryn Maton** Date (Start): **12/22/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/23/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446357 mE
Y = 5027121 mN
Surface Elevation: 72.35 m *(Geodetic)*
Top of PVC Elevation: 72.25 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger / NQ Casing
Borehole Diameter: 203 mm
Drilling Fluid: Water
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

Water Level ▽ Free Phase

CHEMICAL ANALYSIS

PCB	Poly-Chlorinated Biphenyls	SVOC	Semi Volatile Organic Compounds
BTEX	Benzene, Toluene, Ethylbenzene, Xylene	PAH	Polycyclic Aromatic Hydrocarbons
		PH C_{10}-C_{50}	Petroleum Hydrocarbons C_{10}-C_{50}
Inorganics	Inorganic Compounds	PH F1-F4	Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Phenol. C.	Phenolic Compounds	Metals	Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
VOC	Volatil Organic Compounds (MAH & CAH)		
Diox. & Fur.	Dioxins & Furans	HWR	Leacheate Tests (Haz. Waste Reg.)
CAH	Chlorinated Aliphatic Hydrocarbons		

DEPTH *ELEVATION* (m)	GEOLOGY / LITHOLOGY: LITHOLOGY	GEOLOGY / LITHOLOGY: DESCRIPTION	OBSERVATIONS: VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	OBSERVATIONS: ODOUR F M P	OBSERVATIONS: VISUAL D S	SAMPLES: SAMPLE TYPE	SAMPLES: % RECOVERY	SAMPLES: N (Blow/6")	SAMPLES: NUMBER	SAMPLES: ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
21.94 *50.41*		**COBBLES AND BOULDERS** (GLACIAL TILL) ***END OF BOREHOLE*** <u>Notes</u> *1) Auger refusal at 15.2 m below the existing ground surface. Switch to NQ coring.* *2) Coring terminated at 21.9 below the existing ground surface.* *2) 50 mm monitoring well installed at 14.9 m below the existing ground surface* *3) Date Groundwater Depth* *12/26/2016 13.0 mbgs* End of borehole at 21.94 m.												

MONITORING WELL DRILLING RECORD : **BH/MW16-3**

Prepared by: **Kathryn Maton** Date (Start): **12/20/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/20/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446374 mE, Y = 5027130 mN
Surface Elevation: 72.3 m *(Geodetic)*
Top of PVC Elevation: 72.205 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR: F - Light; M - Medium; P - Persistent
VISUAL: D - Disseminated Product; S - Saturated with Product

SAMPLE TYPE: DC - Diamond Corer; SS - Split Spoon; MA - Manual Auger; DP - Direct Push; ST - Shelby Tube; TU - DT32 Liner; MC - Macro Core Liner

Water Level ▽ Free Phase

CHEMICAL ANALYSIS: PCB Poly-Chlorinated Biphenyls; BTEX Benzene, Toluene, Ethylbenzene, Xylene; Inorganics Inorganic Compounds; Phenol. C. Phenolic Compounds; VOC Volatile Organic Compounds (MAH & CAH); Diox. & Fur. Dioxins & Furans; CAH Chlorinated Aliphatic Hydrocarbons; SVOC Semi Volatile Organic Compounds; PAH Polycyclic Aromatic Hydrocarbons; PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}; PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50}); Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.; HWR Leacheate Tests (Haz. Waste Reg.)

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	MONITORING WELL DIAGRAM	MONITORING WELL DESCRIPTION	REMARKS
		Ground surface.												
0.18 / 72.12		**TOPSOIL - 180 mm**	H - 0, I - 0			SS	87	7 4 1 3	SA1A				Bentonite	
0.5		**SANDY SILT** brown, moist, loose (FILL)	H - 0, I - 0						SA1B					
1.0		*- trace roots at 0.9 m below the existing surface elevation*	H - 0, I - 0			SS	87	3 2 3 4	SA2	Metals and Inorganics	SA102			
1.5			H - 0, I - 0			SS	83	3 4 4 3	SA3					
2.0														
2.44 / 69.86		**SAND** trace silt, brown, moist, loose (FILL)	H - 0, I - 0			SS	56	5 3 3 4	SA4					
2.5			H - 0, I - 0			SS	64	2 3 4 4	SA5					
3.0			H - 0, I - 0			SS	75	3 3 5 6	SA6					
4.0														
4.5														
4.88 / 67.42			H - 0, I - 0			SS	75	3 4 6 7	~~SA7A~~					
5.0 / 67.10		**CLAYEY SILT** some sand, grey brown, moist, stiff	H - 0, I - 0						SA7B					
5.5		**SAND** trace gravel, light brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	66	4 7 9 12					Sand	
6.0			H - 0, I - 0											
6.5			H - 0, I - 0			SS	62	4 7 8 15	SA9					
6.86 / 65.44		**SAND** some gravel, trace silt, brown, moist, dense to very dense (GLACIAL TILL)	H - 0, I - 0			SS	71	8 14 15 17	SA10					
7.0														
7.5			H - 0, I - 0			SS	83	11 14 22 24	SA11					
8.0														
8.5			H - 0, I - 0			SS	75	9 28 42 50-4"	SA12					
9.0														
9.5		*- compact*	H - 0, I - 0			SS	37	32 50-5"	SA13					
10.0														

MONITORING WELL DRILLING RECORD : **BH/MW16-3**

Prepared by: **Kathryn Maton** Date (Start): **12/20/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/20/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446374 mE
Y = 5027130 mN
Surface Elevation: 72.3 m *(Geodetic)*
Top of PVC Elevation: 72.205 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatile Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH *ELEVATION* (m)	GEOLOGY / LITHOLOGY: LITHOLOGY	GEOLOGY / LITHOLOGY: DESCRIPTION	OBSERVATIONS: VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	OBSERVATIONS: ODOUR F M P	OBSERVATIONS: VISUAL D S	SAMPLES: SAMPLE TYPE	SAMPLES: % RECOVERY	SAMPLES: N (Blow/6")	SAMPLES: NUMBER	SAMPLES: ANALYSIS	SAMPLES: DUPLICATE	MONITORING WELL: DIAGRAM	MONITORING WELL: DESCRIPTION	REMARKS
10.5 / 72.80		**SAND** some gravel, trace silt, brown, moist, dense to very dense (GLACIAL TILL)	H - 0, I - 0			SS	100	14 11 12 14	SA14					
11.0			H - 0, I - 0			SS	50		SA15				Bentonite	
11.30 / *61.00*		**SILTY SAND** brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	71	17 34 48 33	SA16					
12.0 / 12.20 / *60.10*		**SAND** some gravel, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	71	17 34 48 33	SA17					
12.95 / *59.35*		**SAND AND GRAVEL** trace silt, brown, wet, very dense (GLACIAL TILL)	H - 0, I - 0			SS	29	56 50-3"	SA18				Sand	
13.5		*- silty below 13.7 m in depth*											SCREEN PVC Slotted Pipe Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m	
14.0			H - 0, I - 0			SS	71	23 21 43 29	SA19	PH F_1-F_4 VOC			WATER Depth: 12.89 m Elev.: 59.32 m Date: 12/26/2016	
14.5			H - 0, I - 0			SS	1	50-4"	SA20					
15.0 / 15.24 / *57.06*		***END OF BOREHOLE***												

Notes

1) Auger refusal at 15.2 m below the existing ground surface.
2) 50 mm monitoring well installed at 15.2 m below the existing ground surface
3) Date Groundwater Depth
12/26/2016 13.0 mbgs

End of borehole at 15.24 m.

MONITORING WELL DRILLING RECORD : **BH/MW16-4**

Prepared by: **Kathryn Maton** Date (Start): **12/21/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/21/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446399 mE, Y = 5027114 mN
Surface Elevation: 74.04 m *(Geodetic)*
Top of PVC Elevation: 74.915 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR: F - Light; M - Medium; P - Persistent
VISUAL: D - Disseminated Product; S - Saturated with Product

SAMPLE TYPE: DC - Diamond Corer; SS - Split Spoon; MA - Manual Auger; DP - Direct Push; ST - Shelby Tube; TU - DT32 Liner; MC - Macro Core Liner

CHEMICAL ANALYSIS: PCB Poly-Chlorinated Biphenyls; BTEX Benzene, Toluene, Ethylbenzene, Xylene; Inorganics Inorganic Compounds; Phenol. C. Phenolic Compounds; VOC Volatile Organic Compounds (MAH & CAH); Diox. & Fur. Dioxins & Furans; CAH Chlorinated Aliphatic Hydrocarbons; SVOC Semi Volatile Organic Compounds; PAH Polycyclic Aromatic Hydrocarbons; PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}; PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50}); Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.; HWR Leacheate Tests (Haz. Waste Reg.)

Water Level ▽ Free Phase

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
		Ground surface.												
0.15 / 73.89		**TOPSOIL - 150 mm**	H - 0, I - 0			SS	66	2 2 3 3	SA1A				Bentonite	
0.61 / 73.43		**SAND** brown, moist, (FILL)	H - 0, I - 1						SA1B					
		SILT trace to some sand, brown, moist, very loose (FILL)	H - 0, I - 0			SS	62	2 1 2 3	SA2	Metals and Inorganics				
1.52 / 72.52		**SAND** brown, moist, loose (FILL)	H - 0, I - 0			SS	62	3 4 5 5	SA3					
2.13 / 71.91		**SILTY SAND** brown, moist, loose (FILL)	H - 0, I - 0			SS	60	2 3 4 5	SA4					
			H - 0, I - 0			SS	66	3 4 4 5	SA5					
4.01 / 70.03		**SAND** brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	75	2 4 7 9	SA6A					
		- becoming wet at 4.1 metres below ground surface	H - 0, I - 0						SA6B					
			H - 0, I - 0			SS	85	2 7 11 14	SA7				Sand	
			H - 0, I - 0			SS	79	2 8 11 14	SA8					
			H - 0, I - 0			SS	75	2 8 11 14	SA9					
			H - 0, I - 0			SS	66	7 9 12 14	SA10					
7.62 / 66.42		**SAND** trace gravel, brown, moist, compact to dense (GLACIAL TILL)	H - 0, I - 0			SS	87	8 13 17 20	SA11					
			H - 0, I - 0			SS	87	11 17 18 14	SA12					
			H - 0, I - 0			SS	100	11 12 14 14	SA13					

Projet : BH LOGS - 161-17230-00 -15 AYLMER AVENUE, OTTAWA, ONTARIO.GPJ Type rapport : WSP_EN_WELL-ENVIRONMENTAL Data Template : WSP_TEMPLATE_GEOTECH.GDT 5/16/2017

MONITORING WELL DRILLING RECORD : **BH/MW16-4**

Prepared by: **Kathryn Maton** Date (Start): **12/21/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/21/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446399 mE, Y = 5027114 mN
Surface Elevation: 74.04 m *(Geodetic)*
Top of PVC Elevation: 74.915 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR: F - Light; M - Medium; P - Persistent
VISUAL: D - Disseminated Product; S - Saturated with Product

SAMPLE TYPE: DC - Diamond Corer; SS - Split Spoon; MA - Manual Auger; DP - Direct Push; ST - Shelby Tube; TU - DT32 Liner; MC - Macro Core Liner

CHEMICAL ANALYSIS: PCB Poly-Chlorinated Biphenyls; BTEX Benzene, Toluene, Ethylbenzene, Xylene; Inorganics Inorganic Compounds; Phenol. C. Phenolic Compounds; VOC Volatile Organic Compounds (MAH & CAH); Diox. & Fur. Dioxins & Furans; CAH Chlorinated Aliphatic Hydrocarbons; SVOC Semi Volatile Organic Compounds; PAH Polycyclic Aromatic Hydrocarbons; PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}; PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50}); Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.; HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	MONITORING WELL DIAGRAM	MONITORING WELL DESCRIPTION	REMARKS
10.40			H - 0, I - 0			SS	100	7 6 11 14	SA14	PH F_1-F_4 BTEX				
10.65 / 63.39		**SAND** trace to some silt, trace to some clay, trace gravel, brown, wet (GLACIAL TILL)	H - 0, I - 0			SS	50	12 18 42 50-2"	SA15A				Bentonite	
11.42 / 62.62		**SAND** trace gravel, moist, white-brown, very dense (GLACIAL TILL)	H - 0, I - 0						SA15B					
11.73 / 62.31		**SILTY CLAY** trace gravel, trace ashes, brown, moist, stiff (GLACIAL TILL)	H - 0, I - 0			SS	79	5 25 27 42						
12.20 / 61.84		**SAND** trace to some gravel, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	25	46 50-3"	SA17					
		SAND AND GRAVEL trace to some silt, brown, moist, very dense (GLACIAL TILL)	H - 0, I - 0			SS	12	50-5"	SA18					
		- moist to wet below 13.7 m in depth											PVC Slotted Pipe	
			H - 0, I - 0			SS	37	56 50-3"	SA19				Sand SCREEN	
14.33 / 59.71		**SAND** some gravel, brown, wet, very dense (GLACIAL TILL)	H - 0, I - 0			SS	37	15 27 28 32	SA20	PH F_1-F_4 VOC		▽	Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m WATER Depth: 14.83 m Elev.: 60.09 m Date: 12/26/2016	
16.00 / 58.04		***END OF BOREHOLE***												

Notes

1) Auger refusal at 16.0 m below the existing ground surface.
2) 50 mm monitoring well installed at 16.0 m below the existing ground surface
3) Date Groundwater Depth
12/26/2016 14.0 mbgs

End of borehole at 16.00 m.

Projet : BH LOGS - 161-17230-00 -15 AYLMER AVENUE, OTTAWA, ONTARIO.GPJ Type rapport : WSP_EN_WELL-ENVIRONMENTAL Data Template : WSP_TEMPLATE_GEOTECH.GDT 5/16/2017

MONITORING WELL DRILLING RECORD : **BH/MW16-5**

Prepared by: **Kathryn Maton** Date (Start): **12/20/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/20/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446423 mE, Y = 5027157 mN
Surface Elevation: 71.93 m *(Geodetic)*
Top of PVC Elevation: 71.81 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR: F - Light; M - Medium; P - Persistent
VISUAL: D - Disseminated Product; S - Saturated with Product

SAMPLE TYPE: DC - Diamond Corer; SS - Split Spoon; MA - Manual Auger; DP - Direct Push; ST - Shelby Tube; TU - DT32 Liner; MC - Macro Core Liner

Water Level ▽ Free Phase

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
		Ground surface.												
0.13 / 71.80		**TOPSOIL - 130 mm**	H - 0, I - 0			SS	50	2 2 2 1	SA1A	Metals and Inorganics			Bentonite	
0.5		**SILTY SAND** brown, moist, loose to very loose (FILL)	H - 0, I - 0						SA1B					0.5
1.0			H - 0, I - 0			SS	50	2 2 1 2	SA2					1.0
1.5			H - 0, I - 0			SS	21	2 1 1 1	SA3					1.5
2.13 / 69.80		**SILTY SAND** with brick fragments, trace gravel, brown, moist, loose (FILL)	H - 0, I - 0			SS	24	0 1 3 4	SA4					2.0
2.5														2.5
3.05 / 68.88		**SILTY SAND** moist to wet, compact, brown (FILL)	H - 0, I - 0			SS	79	6 6 5 7	SA5	PH F_1-F_4 BTEX	SA105			3.0
3.5														3.5
4.0			H - 0, I - 0			SS	79	6 6 7 10	SA6A					4.0
4.57 / 67.36			H - 0, I - 0						SA6B					4.5
5.0		**SAND** moist, compact, brown (GLACIAL TILL)	H - 0, I - 0			SS	79	6 5 7 7	SA7					5.0
5.5			H - 0, I - 0			SS	62	4 8 10 13	SA8				Sand	5.5
6.0														6.0
6.5			H - 0, I - 0			SS	62	4 8 12 16	SA9					6.5
6.71 / 65.22		**SAND** with gravel, moist, dense to very dense, brown (GLACIAL TILL)	H - 0, I - 0			SS	71	5 14 26 17	SA10					7.0
7.5														7.5
8.0			H - 0, I - 0			SS	58	7 24 23 17	SA11	PAH	SA111			8.0
8.5			H - 0, I - 0			SS	62	11 21 29 25	SA12					8.5
9.0														9.0
9.5			H - 0, I - 0			SS	71	11 14 12 14	SA13					9.5
10.0														10.0

Projet : BH LOGS - 161-17230-00 -15 AYLMER AVENUE, OTTAWA, ONTARIO.GPJ Type rapport : WSP_EN_WELL-ENVIRONMENTAL Data Template : WSP_TEMPLATE_GEOTECH.GDT 5/16/2017

MONITORING WELL DRILLING RECORD : **BH/MW16-5**

Prepared by: **Kathryn Maton** Date (Start): **12/20/2016**
Reviewed by: **Natalia Codoban** Date (End): **12/20/2016**

Project Name: **Phase Two Environmental Site Assessment**
Site: **1040 Bank Street, Ottawa, Ontario**
Sector:
Client: **Windmill Development**

Project Number: **161-17230-00**
Geographic Coordinates: X = 446423 mE
Y = 5027157 mN
Surface Elevation: 71.93 m *(Geodetic)*
Top of PVC Elevation: 71.81 m *(Geodetic)*

Drilling Company: Downing
Drilling Equipment: CME 75
Drilling Method: Hollow Stem Auger
Borehole Diameter: 203 mm
Drilling Fluid: None
Sampling Method: Split Spoon

ODOUR
F - Light
M - Medium
P - Persistent

VISUAL
D - Disseminated Product
S - Saturated with Product

SAMPLE TYPE
DC - Diamond Corer
SS - Split Spoon
MA - Manual Auger
DP - Direct Push
ST - Shelby Tube
TU - DT32 Liner
MC - Macro Core Liner

CHEMICAL ANALYSIS
PCB Poly-Chlorinated Biphenyls
BTEX Benzene, Toluene, Ethylbenzene, Xylene
Inorganics Inorganic Compounds
Phenol. C. Phenolic Compounds
VOC Volatil Organic Compounds (MAH & CAH)
Diox. & Fur. Dioxins & Furans
CAH Chlorinated Aliphatic Hydrocarbons
SVOC Semi Volatile Organic Compounds
PAH Polycyclic Aromatic Hydrocarbons
PH C_{10}-C_{50} Petroleum Hydrocarbons C_{10}-C_{50}
PH F1-F4 Petroleum Hydrocarbons F1-F4 (C_{10}-C_{50})
Metals Arsenic, Barium, Cadmium, Chromium, Cobalt, Copper, Lead, Manganese, Molybdenum, Nickel, Silver, Tin, Zinc.
HWR Leacheate Tests (Haz. Waste Reg.)

▽ Water Level ▼ Free Phase

DEPTH ELEVATION (m)	LITHOLOGY	DESCRIPTION	VAPOR CONC. I - Isobutylene (ppm) H - Hexane (ppm)	ODOUR F M P	VISUAL D S	SAMPLE TYPE	% RECOVERY	N (Blow/6")	NUMBER	ANALYSIS	DUPLICATE	DIAGRAM	DESCRIPTION	REMARKS
10.67 / 61.26		**SAND** with gravel, moist, dense to very dense, brown (GLACIAL TILL)												
		GRAVEL some sand to sandy, brown, moist, dense (GLACIAL TILL)	H - 0, I - 0			SS	54	18 21 15 26	SA14				Bentonite	
12.20 / 59.73		**SAND** brown, moist, compact (GLACIAL TILL)	H - 0, I - 0			SS	62	17 16 20 23	SA15				Sand	
12.80 / 59.13		**GRAVEL** some sand to sandy, some silt, brown, very dense (GLACIAL TILL)	H - 0, I - 0			SS	66	32 44 56 26	SA16	PH C_{10}-C_{50} BTEX			PVC Slotted Pipe	
13.60 / 58.33		**GRAVEL** some sand to sandy, brown, wet, very dense (GLACIAL TILL)	H - 0, I - 0			SS	21	11 50-4"	SA17				SCREEN Diam.: 51 mm Open.: 0.25 mm Length: 3.05 m	
			H - 0, I - 0			SS	41	15 18 36 42	SA18	VOC	SA118		WATER Depth: 12.87 m Elev.: 58.94 m Date: 12/26/2016	
14.93 / 57.00		***END OF BOREHOLE***												

Notes

1) Auger refusal at 14.9 m below the existing ground surface.
2) 50 mm monitoring well installed at 14.9 m below the existing ground surface
3) Date Groundwater Depth
12/26/2016 13.0 mbgs

End of borehole at 14.93 m.

Appendix C

CERTIFICATES OF ANALYSIS

WSP Canada Inc. (Ottawa)
ATTN: Kathryn Maton
2611 Queensview Dr
Suite 300
Ottawa ON K2B 8K2

Date Received: 23-DEC-16
Report Date: 03-JAN-17 14:44 (MT)
Version: FINAL

Client Phone: 613-829-2800

Certificate of Analysis

Lab Work Order #: L1873853

Project P.O. #: NOT SUBMITTED
Job Reference: 161-17230-00
C of C Numbers:
Legal Site Desc:

Emerson Perez, B.S.E
Account Manager

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873853-1	L1873853-2	L1873853-3
					Sampled Date	20-DEC-16	20-DEC-16	20-DEC-16
					Sampled Time	09:00	09:00	09:00
					Sample ID	BH16-5 SA11	BH16-5 SA111	BH16-5 SA6A
Grouping	Analyte	Unit	Guide Limits #1	#2				
Physical Tests	% Moisture	%	-	-		4.25	3.75	6.08
Polycyclic Aromatic Hydrocarbons	Acenaphthene	ug/g	7.9	29		<0.050	<0.050	<0.050
	Acenaphthylene	ug/g	0.15	0.17		<0.050	<0.050	<0.050
	Anthracene	ug/g	0.67	0.74		<0.050	<0.050	<0.050
	Benzo(a)anthracene	ug/g	0.5	0.63		<0.050	<0.050	<0.050
	Benzo(a)pyrene	ug/g	0.3	0.3		<0.050	<0.050	<0.050
	Benzo(b)fluoranthene	ug/g	0.78	0.78		<0.050	<0.050	<0.050
	Benzo(g,h,i)perylene	ug/g	6.6	7.8		<0.050	<0.050	<0.050
	Benzo(k)fluoranthene	ug/g	0.78	0.78		<0.050	<0.050	<0.050
	Chrysene	ug/g	7	7.8		<0.050	<0.050	<0.050
	Dibenzo(ah)anthracene	ug/g	0.1	0.1		<0.050	<0.050	<0.050
	Fluoranthene	ug/g	0.69	0.69		<0.050	<0.050	<0.050
	Fluorene	ug/g	62	69		<0.050	<0.050	<0.050
	Indeno(1,2,3-cd)pyrene	ug/g	0.38	0.48		<0.050	<0.050	<0.050
	1+2-Methylnaphthalenes	ug/g	0.99	3.4		<0.042	<0.042	<0.042
	1-Methylnaphthalene	ug/g	0.99	3.4		<0.030	<0.030	<0.030
	2-Methylnaphthalene	ug/g	0.99	3.4		<0.030	<0.030	<0.030
	Naphthalene	ug/g	0.6	0.75		<0.050	<0.050	<0.050
	Phenanthrene	ug/g	6.2	7.8		<0.050	<0.050	<0.050
	Pyrene	ug/g	78	78		<0.050	<0.050	<0.050
	Surrogate: 2-Fluorobiphenyl	%	-	-		94.9	96.5	96.2
	Surrogate: p-Terphenyl d14	%	-	-		90.8	91.9	91.7

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Summary of Guideline Exceedances

ALS ID	Client ID	Grouping	Analyte	Result	Guideline Limit	Unit	Guideline

Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Coarse)

(No parameter exceedances)

Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Fine)

(No parameter exceedances)

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
METHYLNAPS-CALC-WT	Soil	ABN-Calculated Parameters	SW846 8270
MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PAH-511-WT	Soil	PAH-O.Reg 153/04 (July 2011)	SW846 3510/8270

A representative sub-sample of soil is fortified with deuterium-labelled surrogates and a mechanical shaking techniqueis used to extract the sample with a mixture of methanol and toluene. The extracts are concentrated and analyzed by GC/MS. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1873853 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT	**Soil**							
Batch R3624461								
WG2457451-3 DUP		**L1873786-14**						
% Moisture		5.58	5.55		%	0.5	20	29-DEC-16
WG2457451-2 LCS								
% Moisture			100.8		%		90-110	29-DEC-16
WG2457451-1 MB								
% Moisture			<0.10		%		0.1	29-DEC-16
PAH-511-WT	**Soil**							
Batch R3626902								
WG2457538-4 DUP		**WG2457538-3**						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	03-JAN-17
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	03-JAN-17
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Benzo(b)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Benzo(g,h,i)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Dibenzo(ah)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Naphthalene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Phenanthrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	03-JAN-17
WG2457538-2 LCS								
1-Methylnaphthalene			103.3		%		50-140	03-JAN-17
2-Methylnaphthalene			101.6		%		50-140	03-JAN-17
Acenaphthene			104.0		%		50-140	03-JAN-17
Acenaphthylene			99.97		%		50-140	03-JAN-17
Anthracene			99.8		%		50-140	03-JAN-17
Benzo(a)anthracene			102.4		%		50-140	03-JAN-17
Benzo(a)pyrene			99.4		%		50-140	03-JAN-17

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R3626902								
WG2457538-2 LCS								
Benzo(b)fluoranthene			111.1		%		50-140	03-JAN-17
Benzo(g,h,i)perylene			84.4		%		50-140	03-JAN-17
Benzo(k)fluoranthene			106.6		%		50-140	03-JAN-17
Chrysene			111.5		%		50-140	03-JAN-17
Dibenzo(ah)anthracene			85.9		%		50-140	03-JAN-17
Fluoranthene			97.9		%		50-140	03-JAN-17
Fluorene			101.2		%		50-140	03-JAN-17
Indeno(1,2,3-cd)pyrene			78.4		%		50-140	03-JAN-17
Naphthalene			107.1		%		50-140	03-JAN-17
Phenanthrene			104.8		%		50-140	03-JAN-17
Pyrene			99.96		%		50-140	03-JAN-17
WG2457538-1 MB								
1-Methylnaphthalene			<0.030		ug/g		0.03	03-JAN-17
2-Methylnaphthalene			<0.030		ug/g		0.03	03-JAN-17
Acenaphthene			<0.050		ug/g		0.05	03-JAN-17
Acenaphthylene			<0.050		ug/g		0.05	03-JAN-17
Anthracene			<0.050		ug/g		0.05	03-JAN-17
Benzo(a)anthracene			<0.050		ug/g		0.05	03-JAN-17
Benzo(a)pyrene			<0.050		ug/g		0.05	03-JAN-17
Benzo(b)fluoranthene			<0.050		ug/g		0.05	03-JAN-17
Benzo(g,h,i)perylene			<0.050		ug/g		0.05	03-JAN-17
Benzo(k)fluoranthene			<0.050		ug/g		0.05	03-JAN-17
Chrysene			<0.050		ug/g		0.05	03-JAN-17
Dibenzo(ah)anthracene			<0.050		ug/g		0.05	03-JAN-17
Fluoranthene			<0.050		ug/g		0.05	03-JAN-17
Fluorene			<0.050		ug/g		0.05	03-JAN-17
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	03-JAN-17
Naphthalene			<0.050		ug/g		0.05	03-JAN-17
Phenanthrene			<0.050		ug/g		0.05	03-JAN-17
Pyrene			<0.050		ug/g		0.05	03-JAN-17
Surrogate: 2-Fluorobiphenyl			97.8		%		50-140	03-JAN-17
Surrogate: p-Terphenyl d14			93.6		%		50-140	03-JAN-17
WG2457538-5 MS		**WG2457538-3**						
1-Methylnaphthalene			101.0		%		50-140	03-JAN-17

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PAH-511-WT	**Soil**							
Batch R3626902								
WG2457538-5 MS		**WG2457538-3**						
2-Methylnaphthalene			98.8		%		50-140	03-JAN-17
Acenaphthene			101.4		%		50-140	03-JAN-17
Acenaphthylene			97.5		%		50-140	03-JAN-17
Anthracene			98.1		%		50-140	03-JAN-17
Benzo(a)anthracene			102.1		%		50-140	03-JAN-17
Benzo(a)pyrene			101.7		%		50-140	03-JAN-17
Benzo(b)fluoranthene			112.5		%		50-140	03-JAN-17
Benzo(g,h,i)perylene			81.7		%		50-140	03-JAN-17
Benzo(k)fluoranthene			105.3		%		50-140	03-JAN-17
Chrysene			111.7		%		50-140	03-JAN-17
Dibenzo(ah)anthracene			82.9		%		50-140	03-JAN-17
Fluoranthene			98.7		%		50-140	03-JAN-17
Fluorene			98.0		%		50-140	03-JAN-17
Indeno(1,2,3-cd)pyrene			77.2		%		50-140	03-JAN-17
Naphthalene			104.9		%		50-140	03-JAN-17
Phenanthrene			102.9		%		50-140	03-JAN-17
Pyrene			100.6		%		50-140	03-JAN-17

Quality Control Report

Workorder: L1873853 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1873853-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	WSP Canada Inc. (Ottawa)	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Kathryn Maton	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	(613) 617-9237	☑ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	2611 Queensview Drive, Suite 300	Email 1 or Fax kathryn.Maton@wspgroup.com	Date and Time Required for all E&P TATs:
City/Province:	Ottawa, ON	Email 2	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	K2B 8K2	Email 3	

Invoice To		Invoice Distribution
	Same as Report To ☑ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
	Copy of Invoice with Report ☐ YES ☐ NO	
Company:		Email 1 or Fax kathryn.Maton@wspgroup.com
Contact:		Email 2 payables.ontario@wspgroup.com

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	25601 / Quote Q59797	AFE/Cost Center:	PO#
Job #:	161-17230-00	Major/Minor Code:	Routing Code:
PO / AFE:	n/a	Requisitioner:	
LSD:	n/a	Location:	
ALS Lab Work Order # (lab use only)	L1873853	ALS Contact: E. Perez	Sampler:

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals and Inorganics	VOCs	BTEX, F1-F4	PAH	Oxy 153	Number of Containers
1	BH16-5 SA11	20/12/16	8921	Soil				X		1
2	BH16-5 SA11	↓	↓	↓				X		↓
3	BH16-5 SA6A							X		
4	BH16-5 SA6B - HOLD!!							X		
5	BH16-5 SA15 - HOLD!!							X		

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)
Are samples taken from a Regulated DW System? ☐ YES ☑ NO	Compare against ON Reg. 153/04 Table 2 (RPI / ICC (circle one)
Are samples for human drinking water use? ☐ YES ☑ NO	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
9.9					5.4

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:
K Maton	23/12/2016	3:15	Tammy Andrews	Dec 23rd/2016	3:00		24-Dec-16	10:30

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WSP Canada Inc. (Ottawa)
ATTN: Kathryn Maton
2611 Queensview Dr
Suite 300
Ottawa ON K2B 8K2

Date Received: 22-DEC-16
Report Date: 03-JAN-17 14:42 (MT)
Version: FINAL

Client Phone: 613-829-2800

Certificate of Analysis

Lab Work Order #: L1873852

Project P.O. #: NOT SUBMITTED
Job Reference: 161-17230-00
C of C Numbers: 14-447431
Legal Site Desc:

Emerson Perez, B.S.E
Account Manager

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873852-1	L1873852-2	L1873852-3
					Sampled Date	22-DEC-16	22-DEC-16	22-DEC-16
					Sampled Time	09:00	09:00	09:00
					Sample ID	BH16-2 SA1B	BH16-2 SA18	BH16-2 SA20
Grouping	Analyte	Unit	Guide Limits #1	#2				
Physical Tests	Conductivity	mS/cm	0.7	0.7		0.793		
	% Moisture	%	-	-		17.2	14.0	10.9
	pH	pH units	-	-		7.44		
Cyanides	Cyanide, Weak Acid Diss	ug/g	0.051	0.051		<0.050		
Saturated Paste Extractables	SAR	SAR	5	5		0.35		
	Calcium (Ca)	mg/L	-	-		137		
	Magnesium (Mg)	mg/L	-	-		6.9		
	Sodium (Na)	mg/L	-	-		15.5		
Metals	Antimony (Sb)	ug/g	7.5	7.5		<1.0		
	Arsenic (As)	ug/g	18	18		4.3		
	Barium (Ba)	ug/g	390	390		71.4		
	Beryllium (Be)	ug/g	4	5		<0.50		
	Boron (B)	ug/g	120	120		<5.0		
	Boron (B), Hot Water Ext.	ug/g	1.5	1.5		0.21		
	Cadmium (Cd)	ug/g	1.2	1.2		<0.50		
	Chromium (Cr)	ug/g	160	160		21.0		
	Cobalt (Co)	ug/g	22	22		5.2		
	Copper (Cu)	ug/g	140	180		8.5		
	Lead (Pb)	ug/g	120	120		15.7		
	Mercury (Hg)	ug/g	0.27	1.8		0.0452		
	Molybdenum (Mo)	ug/g	6.9	6.9		<1.0		
	Nickel (Ni)	ug/g	100	130		10.6		

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873852-1	L1873852-2	L1873852-3
					Sampled Date	22-DEC-16	22-DEC-16	22-DEC-16
					Sampled Time	09:00	09:00	09:00
					Sample ID	BH16-2 SA1B	BH16-2 SA18	BH16-2 SA20
Grouping	Analyte	Unit	Guide Limits #1	#2				
Metals	Selenium (Se)	ug/g	2.4	2.4		<1.0		
	Silver (Ag)	ug/g	20	25		<0.20		
	Thallium (Tl)	ug/g	1	1		<0.50		
	Uranium (U)	ug/g	23	23		<1.0		
	Vanadium (V)	ug/g	86	86		32.2		
	Zinc (Zn)	ug/g	340	340		34.3		
Speciated Metals	Chromium, Hexavalent	ug/g	8	10		<0.20		
Volatile Organic Compounds	Acetone	ug/g	16	28				<0.50
	Benzene	ug/g	0.21	0.17			<0.0068	<0.0068
	Bromodichloromethane	ug/g	1.5	1.9				<0.050
	Bromoform	ug/g	0.27	0.26				<0.050
	Bromomethane	ug/g	0.05	0.05				<0.050
	Carbon tetrachloride	ug/g	0.05	0.12				<0.050
	Chlorobenzene	ug/g	2.4	2.7				<0.050
	Dibromochloromethane	ug/g	2.3	2.9				<0.050
	Chloroform	ug/g	0.05	0.17				<0.050
	1,2-Dibromoethane	ug/g	0.05	0.05				<0.050
	1,2-Dichlorobenzene	ug/g	1.2	1.7				<0.050
	1,3-Dichlorobenzene	ug/g	4.8	6				<0.050
	1,4-Dichlorobenzene	ug/g	0.083	0.097				<0.050
	Dichlorodifluoromethane	ug/g	16	25				<0.050
	1,1-Dichloroethane	ug/g	0.47	0.6				<0.050

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873852-1	L1873852-2	L1873852-3
					Sampled Date	22-DEC-16	22-DEC-16	22-DEC-16
					Sampled Time	09:00	09:00	09:00
					Sample ID	BH16-2 SA1B	BH16-2 SA18	BH16-2 SA20
Grouping	Analyte	Unit	Guide Limits #1	#2				
Volatile Organic Compounds	1,2-Dichloroethane	ug/g	0.05	0.05				<0.050
	1,1-Dichloroethylene	ug/g	0.05	0.05				<0.050
	cis-1,2-Dichloroethylene	ug/g	1.9	2.5				<0.050
	trans-1,2-Dichloroethylene	ug/g	0.084	0.75				<0.050
	Methylene Chloride	ug/g	0.1	0.96				<0.050
	1,2-Dichloropropane	ug/g	0.05	0.085				<0.050
	cis-1,3-Dichloropropene	ug/g	-	-				<0.030
	trans-1,3-Dichloropropene	ug/g	-	-				<0.030
	1,3-Dichloropropene (cis & trans)	ug/g	0.05	0.081				<0.042
	Ethylbenzene	ug/g	1.1	1.6			<0.018	<0.018
	n-Hexane	ug/g	2.8	34				<0.050
	Methyl Ethyl Ketone	ug/g	16	44				<0.50
	Methyl Isobutyl Ketone	ug/g	1.7	4.3				<0.50
	MTBE	ug/g	0.75	1.4				<0.050
	Styrene	ug/g	0.7	2.2				<0.050
	1,1,1,2-Tetrachloroethane	ug/g	0.058	0.05				<0.050
	1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05				<0.050
	Tetrachloroethylene	ug/g	0.28	2.3				<0.050
	Toluene	ug/g	2.3	6			<0.080	<0.080
	1,1,1-Trichloroethane	ug/g	0.38	3.4				<0.050
	1,1,2-Trichloroethane	ug/g	0.05	0.05				<0.050
	Trichloroethylene	ug/g	0.061	0.52				<0.010

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873852-1	L1873852-2	L1873852-3
					Sampled Date	22-DEC-16	22-DEC-16	22-DEC-16
					Sampled Time	09:00	09:00	09:00
					Sample ID	BH16-2 SA1B	BH16-2 SA18	BH16-2 SA20
Grouping	Analyte	Unit	Guide Limits #1	#2				
Volatile Organic Compounds	Trichlorofluoromethane	ug/g	4	5.8				<0.050
	Vinyl chloride	ug/g	0.02	0.022				<0.020
	o-Xylene	ug/g	-	-			<0.020	<0.020
	m+p-Xylenes	ug/g	-	-			<0.030	<0.030
	Xylenes (Total)	ug/g	3.1	25			<0.050	<0.050
	Surrogate: 4-Bromofluorobenzene	%	-	-			104.1	99.3
	Surrogate: 1,4-Difluorobenzene	%	-	-			106.1	107.0
Hydrocarbons	F1 (C6-C10)	ug/g	55	65			<5.0	
	F1-BTEX	ug/g	55	65			<5.0	
	F2 (C10-C16)	ug/g	98	150			<10	
	F3 (C16-C34)	ug/g	300	1300			<50	
	F4 (C34-C50)	ug/g	2800	5600			<50	
	Total Hydrocarbons (C6-C50)	ug/g	-	-			<72	
	Chrom. to baseline at nC50		-	-			YES	
	Surrogate: 2-Bromobenzotrifluoride	%	-	-			88.0	
	Surrogate: 3,4-Dichlorotoluene	%	-	-			86.8	

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

Summary of Guideline Exceedances

ALS ID	Client ID	Grouping	Analyte	Result	Guideline Limit	Unit
Guideline						
Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Coarse)						
L1873852-1	BH16-2 SA1B	Physical Tests	Conductivity	0.793	0.7	mS/cm
Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Fine)						
L1873852-1	BH16-2 SA1B	Physical Tests	Conductivity	0.793	0.7	mS/cm

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

BTX-511-HS-WT	Soil	BTEX-O.Reg 153/04 (July 2011)	SW846 8260

BTX is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-WAD-R511-WT	Soil	Cyanide (WAD)-O.Reg 153/04 (July 2011)	MOE 3015/APHA 4500CN I-WAD

The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-WT	Soil	Conductivity (EC)	MOEE E3138

A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT Soil F1-O.Reg 153/04 (July 2011) E3398/CCME TIER 1-HS

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT Soil F2-F4-O.Reg 153/04 (July 2011) MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by extracting a soil sample with a solvent mix. The solvent recovered from the extracted soil sample is dried and treated to remove polar material. The extract is analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-200.2-CVAA-WT Soil Mercury in Soil by CVAAS EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-200.2-CCMS-WT Soil Metals in Soil by CRC ICPMS EPA 200.2/6020A (mod)

Dried, ground and sieved soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MOISTURE-WT Soil % Moisture Gravimetric: Oven Dried

PH-WT Soil pH MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

SAR-R511-WT Soil SAR-O.Reg 153/04 (July 2011) SW846 6010C

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT Soil Regulation 153 VOCs SW8260B/SW8270C

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

14-447431

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1873852 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	**Soil**							
Batch R3624834								
WG2457936-4 DUP		**L1873430-1**						
Boron (B), Hot Water Ext.		0.24	0.23		ug/g	6.8	30	29-DEC-16
WG2457936-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			91.9		%		70-130	29-DEC-16
WG2457936-3 LCS								
Boron (B), Hot Water Ext.			102.3		%		70-130	29-DEC-16
WG2457936-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	29-DEC-16
BTX-511-HS-WT	**Soil**							
Batch R3624838								
WG2457455-4 DUP		**WG2457455-3**						
Benzene		0.0151	0.0148		ug/g	2.2	40	29-DEC-16
Ethylbenzene		0.043	0.041		ug/g	4.6	40	29-DEC-16
m+p-Xylenes		0.126	0.124		ug/g	1.5	40	29-DEC-16
o-Xylene		0.152	0.147		ug/g	3.7	40	29-DEC-16
Toluene		0.115	0.111		ug/g	4.0	40	29-DEC-16
WG2457455-2 LCS								
Benzene			106.4		%		70-130	29-DEC-16
Ethylbenzene			103.4		%		70-130	29-DEC-16
m+p-Xylenes			103.2		%		70-130	29-DEC-16
o-Xylene			99.6		%		70-130	29-DEC-16
Toluene			102.1		%		70-130	29-DEC-16
WG2457455-1 MB								
Benzene			<0.0068		ug/g		0.0068	29-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	29-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	29-DEC-16
o-Xylene			<0.020		ug/g		0.02	29-DEC-16
Toluene			<0.080		ug/g		0.08	29-DEC-16
Surrogate: 1,4-Difluorobenzene			110.1		%		50-140	29-DEC-16
Surrogate: 4-Bromofluorobenzene			102.6		%		50-140	29-DEC-16
WG2457455-5 MS		**WG2457455-3**						
Benzene			107.1		%		60-140	29-DEC-16
Ethylbenzene			110.9		%		60-140	29-DEC-16
m+p-Xylenes			107.9		%		60-140	29-DEC-16
o-Xylene			110.3		%		60-140	29-DEC-16
Toluene			114.5		%		60-140	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT	**Soil**							
Batch R3626893								
WG2458109-3 DUP		**L1873852-1**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	30-DEC-16
WG2458109-2 LCS								
Cyanide, Weak Acid Diss			93.9		%		80-120	30-DEC-16
WG2458109-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	30-DEC-16
WG2458109-4 MS		**L1873852-1**						
Cyanide, Weak Acid Diss			101.1		%		70-130	30-DEC-16
CR-CR6-IC-WT	**Soil**							
Batch R3626621								
WG2458120-3 CRM		**WT-SQC012**						
Chromium, Hexavalent			93.9		%		70-130	30-DEC-16
WG2458120-4 DUP		**L1871396-15**						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	30-DEC-16
WG2458120-2 LCS								
Chromium, Hexavalent			88.0		%		80-120	30-DEC-16
WG2458120-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	30-DEC-16
EC-WT	**Soil**							
Batch R3625680								
WG2458476-4 DUP		**WG2458476-3**						
Conductivity		0.695	0.698		mS/cm	0.4	20	30-DEC-16
WG2458546-2 LCS								
Conductivity			105.2		%		90-110	30-DEC-16
WG2458476-1 MB								
Conductivity			<0.0040		mS/cm		0.004	30-DEC-16
F1-HS-511-WT	**Soil**							
Batch R3624838								
WG2457455-4 DUP		**WG2457455-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	29-DEC-16
WG2457455-2 LCS								
F1 (C6-C10)			89.7		%		80-120	29-DEC-16
WG2457455-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	29-DEC-16
Surrogate: 3,4-Dichlorotoluene			109.7		%		60-140	29-DEC-16
WG2457455-7 MS		**WG2457455-6**						
F1 (C6-C10)			70.2		%		60-140	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	**Soil**							
Batch R3626534								
WG2457442-3 CRM		**ALS PHC2 IRM**						
F2 (C10-C16)			100.1		%		70-130	30-DEC-16
F3 (C16-C34)			105.8		%		70-130	30-DEC-16
F4 (C34-C50)			109.2		%		70-130	30-DEC-16
WG2457442-5 DUP		**WG2457442-4**						
F2 (C10-C16)		15	25	J	ug/g	9	20	30-DEC-16
F3 (C16-C34)		54	65		ug/g	20	30	30-DEC-16
F4 (C34-C50)		<50	52	RPD-NA	ug/g	N/A	30	30-DEC-16
WG2457442-2 LCS								
F2 (C10-C16)			104.6		%		80-120	30-DEC-16
F3 (C16-C34)			110.5		%		80-120	30-DEC-16
F4 (C34-C50)			104.9		%		80-120	30-DEC-16
WG2457442-1 MB								
F2 (C10-C16)			<10		ug/g		10	30-DEC-16
F3 (C16-C34)			<50		ug/g		50	30-DEC-16
F4 (C34-C50)			<50		ug/g		50	30-DEC-16
Surrogate: 2-Bromobenzotrifluoride			87.2		%		60-140	30-DEC-16
HG-200.2-CVAA-WT	**Soil**							
Batch R3624984								
WG2457939-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			96.7		%		70-130	29-DEC-16
WG2457939-6 DUP		**WG2457939-5**						
Mercury (Hg)		0.0746	0.0828		ug/g	10	40	29-DEC-16
WG2457939-3 LCS								
Mercury (Hg)			102.0		%		80-120	29-DEC-16
WG2457939-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	29-DEC-16
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			112.6		%		70-130	29-DEC-16
Arsenic (As)			125.0		%		70-130	29-DEC-16
Barium (Ba)			126.8		%		70-130	29-DEC-16
Beryllium (Be)			98.9		%		70-130	29-DEC-16
Cadmium (Cd)			113.2		%		70-130	29-DEC-16
Chromium (Cr)			125.5		%		70-130	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-2 CRM		**WT-CANMET-TILL1**						
Cobalt (Co)			119.2		%		70-130	29-DEC-16
Copper (Cu)			114.9		%		70-130	29-DEC-16
Lead (Pb)			103.2		%		70-130	29-DEC-16
Molybdenum (Mo)			101.6		%		70-130	29-DEC-16
Nickel (Ni)			120.0		%		70-130	29-DEC-16
Selenium (Se)			102.4		%		70-130	29-DEC-16
Silver (Ag)			112.1		%		70-130	29-DEC-16
Thallium (Tl)			113.5		%		70-130	29-DEC-16
Uranium (U)			125.8		%		70-130	29-DEC-16
Vanadium (V)			127.7		%		70-130	29-DEC-16
Zinc (Zn)			116.4		%		70-130	29-DEC-16
WG2457939-6 DUP		**WG2457939-5**						
Antimony (Sb)		0.28	0.27		ug/g	2.1	30	29-DEC-16
Arsenic (As)		2.30	2.13		ug/g	7.3	30	29-DEC-16
Barium (Ba)		60.7	58.8		ug/g	3.3	40	29-DEC-16
Beryllium (Be)		0.23	0.23		ug/g	1.6	30	29-DEC-16
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	29-DEC-16
Cadmium (Cd)		0.143	0.125		ug/g	13	30	29-DEC-16
Chromium (Cr)		14.1	13.9		ug/g	1.5	30	29-DEC-16
Cobalt (Co)		4.50	4.15		ug/g	8.3	30	29-DEC-16
Copper (Cu)		15.7	14.6		ug/g	7.0	30	29-DEC-16
Lead (Pb)		49.8	53.4		ug/g	6.9	40	29-DEC-16
Molybdenum (Mo)		0.26	0.30		ug/g	14	40	29-DEC-16
Nickel (Ni)		8.15	7.84		ug/g	3.9	30	29-DEC-16
Selenium (Se)		0.22	0.22		ug/g	2.1	30	29-DEC-16
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	29-DEC-16
Thallium (Tl)		0.074	0.070		ug/g	4.6	30	29-DEC-16
Uranium (U)		0.514	0.497		ug/g	3.4	30	29-DEC-16
Vanadium (V)		25.8	24.2		ug/g	6.6	30	29-DEC-16
Zinc (Zn)		41.0	41.4		ug/g	1.0	30	29-DEC-16
WG2457939-4 LCS								
Antimony (Sb)			106.7		%		80-120	29-DEC-16
Arsenic (As)			99.3		%		80-120	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-4 LCS								
Barium (Ba)			100.3		%		80-120	29-DEC-16
Beryllium (Be)			94.6		%		80-120	29-DEC-16
Boron (B)			94.7		%		80-120	29-DEC-16
Cadmium (Cd)			96.1		%		80-120	29-DEC-16
Chromium (Cr)			99.5		%		80-120	29-DEC-16
Cobalt (Co)			98.6		%		80-120	29-DEC-16
Copper (Cu)			96.7		%		80-120	29-DEC-16
Lead (Pb)			103.2		%		80-120	29-DEC-16
Molybdenum (Mo)			95.6		%		80-120	29-DEC-16
Nickel (Ni)			98.0		%		80-120	29-DEC-16
Selenium (Se)			96.4		%		80-120	29-DEC-16
Silver (Ag)			100.6		%		80-120	29-DEC-16
Thallium (Tl)			100.1		%		80-120	29-DEC-16
Uranium (U)			102.1		%		80-120	29-DEC-16
Vanadium (V)			101.4		%		80-120	29-DEC-16
Zinc (Zn)			91.5		%		80-120	29-DEC-16
WG2457939-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	29-DEC-16
Arsenic (As)			<0.10		mg/kg		0.1	29-DEC-16
Barium (Ba)			<0.50		mg/kg		0.5	29-DEC-16
Beryllium (Be)			<0.10		mg/kg		0.1	29-DEC-16
Boron (B)			<5.0		mg/kg		5	29-DEC-16
Cadmium (Cd)			<0.020		mg/kg		0.02	29-DEC-16
Chromium (Cr)			<0.50		mg/kg		0.5	29-DEC-16
Cobalt (Co)			<0.10		mg/kg		0.1	29-DEC-16
Copper (Cu)			<0.50		mg/kg		0.5	29-DEC-16
Lead (Pb)			<0.50		mg/kg		0.5	29-DEC-16
Molybdenum (Mo)			<0.10		mg/kg		0.1	29-DEC-16
Nickel (Ni)			<0.50		mg/kg		0.5	29-DEC-16
Selenium (Se)			<0.20		mg/kg		0.2	29-DEC-16
Silver (Ag)			<0.10		mg/kg		0.1	29-DEC-16
Thallium (Tl)			<0.050		mg/kg		0.05	29-DEC-16
Uranium (U)			<0.050		mg/kg		0.05	29-DEC-16
Vanadium (V)			<0.20		mg/kg		0.2	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-1 MB								
Zinc (Zn)			<2.0		mg/kg		2	29-DEC-16
MOISTURE-WT	**Soil**							
Batch R3624463								
WG2457443-3 DUP		**L1873820-1**						
% Moisture		33.9	33.6		%	0.8	20	29-DEC-16
WG2457443-2 LCS								
% Moisture			99.4		%		90-110	29-DEC-16
WG2457443-1 MB								
% Moisture			<0.10		%		0.1	29-DEC-16
PH-WT	**Soil**							
Batch R3624476								
WG2457462-1 DUP		**L1873842-6**						
pH		7.87	7.82	J	pH units	0.05	0.3	28-DEC-16
WG2457510-4 LCS								
pH			6.97		pH units		6.7-7.3	28-DEC-16
SAR-R511-WT	**Soil**							
Batch R3625676								
WG2458476-4 DUP		**WG2458476-3**						
Calcium (Ca)		18.6	18.4		mg/L	0.8	30	30-DEC-16
Sodium (Na)		105	104		mg/L	0.6	30	30-DEC-16
Magnesium (Mg)		3.2	3.2		mg/L	0.5	30	30-DEC-16
WG2458476-2 IRM		**WT SAR1**						
Calcium (Ca)			108.2		%		70-130	30-DEC-16
Sodium (Na)			95.3		%		70-130	30-DEC-16
Magnesium (Mg)			107.9		%		70-130	30-DEC-16
WG2458476-1 MB								
Calcium (Ca)			<1.0		mg/L		1	30-DEC-16
Sodium (Na)			<1.0		mg/L		1	30-DEC-16
Magnesium (Mg)			<1.0		mg/L		1	30-DEC-16
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-4 DUP		**WG2457612-3**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-4 DUP		**WG2457612-3**						
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	29-DEC-16
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	29-DEC-16
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Toluene		<0.080	<0.080		ug/g			29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-4 DUP		**WG2457612-3**						
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	29-DEC-16
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	29-DEC-16
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	29-DEC-16
WG2457612-2 LCS								
1,1,1,2-Tetrachloroethane			97.6		%		60-130	29-DEC-16
1,1,2,2-Tetrachloroethane			115.2		%		60-130	29-DEC-16
1,1,1-Trichloroethane			97.2		%		60-130	29-DEC-16
1,1,2-Trichloroethane			108.7		%		60-130	29-DEC-16
1,1-Dichloroethane			102.6		%		60-130	29-DEC-16
1,1-Dichloroethylene			93.5		%		60-130	29-DEC-16
1,2-Dibromoethane			108.5		%		70-130	29-DEC-16
1,2-Dichlorobenzene			100.7		%		70-130	29-DEC-16
1,2-Dichloroethane			112.9		%		60-130	29-DEC-16
1,2-Dichloropropane			107.7		%		70-130	29-DEC-16
1,3-Dichlorobenzene			94.7		%		70-130	29-DEC-16
1,4-Dichlorobenzene			97.1		%		70-130	29-DEC-16
Acetone			136.3		%		60-140	29-DEC-16
Benzene			102.4		%		70-130	29-DEC-16
Bromodichloromethane			103.2		%		50-140	29-DEC-16
Bromoform			111.0		%		70-130	29-DEC-16
Bromomethane			97.0		%		50-140	29-DEC-16
Carbon tetrachloride			93.6		%		70-130	29-DEC-16
Chlorobenzene			98.9		%		70-130	29-DEC-16
Chloroform			103.6		%		70-130	29-DEC-16
cis-1,2-Dichloroethylene			102.7		%		70-130	29-DEC-16
cis-1,3-Dichloropropene			111.7		%		70-130	29-DEC-16
Dibromochloromethane			109.6		%		60-130	29-DEC-16
Dichlorodifluoromethane			61.6		%		50-140	29-DEC-16
Ethylbenzene			90.4		%		70-130	29-DEC-16
n-Hexane			99.3		%		70-130	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-2 LCS								
Methylene Chloride			107.2		%		70-130	29-DEC-16
MTBE			97.9		%		70-130	29-DEC-16
m+p-Xylenes			92.1		%		70-130	29-DEC-16
Methyl Ethyl Ketone			127.1		%		60-140	29-DEC-16
Methyl Isobutyl Ketone			124.0		%		60-140	29-DEC-16
o-Xylene			93.5		%		70-130	29-DEC-16
Styrene			97.4		%		70-130	29-DEC-16
Tetrachloroethylene			87.4		%		60-130	29-DEC-16
Toluene			94.5		%		70-130	29-DEC-16
trans-1,2-Dichloroethylene			97.0		%		60-130	29-DEC-16
trans-1,3-Dichloropropene			108.5		%		70-130	29-DEC-16
Trichloroethylene			94.9		%		60-130	29-DEC-16
Trichlorofluoromethane			94.6		%		50-140	29-DEC-16
Vinyl chloride			84.8		%		60-140	29-DEC-16
WG2457612-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	29-DEC-16
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	29-DEC-16
1,1,1-Trichloroethane			<0.050		ug/g		0.05	29-DEC-16
1,1,2-Trichloroethane			<0.050		ug/g		0.05	29-DEC-16
1,1-Dichloroethane			<0.050		ug/g		0.05	29-DEC-16
1,1-Dichloroethylene			<0.050		ug/g		0.05	29-DEC-16
1,2-Dibromoethane			<0.050		ug/g		0.05	29-DEC-16
1,2-Dichlorobenzene			<0.050		ug/g		0.05	29-DEC-16
1,2-Dichloroethane			<0.050		ug/g		0.05	29-DEC-16
1,2-Dichloropropane			<0.050		ug/g		0.05	29-DEC-16
1,3-Dichlorobenzene			<0.050		ug/g		0.05	29-DEC-16
1,4-Dichlorobenzene			<0.050		ug/g		0.05	29-DEC-16
Acetone			<0.50		ug/g		0.5	29-DEC-16
Benzene			<0.0068		ug/g		0.0068	29-DEC-16
Bromodichloromethane			<0.050		ug/g		0.05	29-DEC-16
Bromoform			<0.050		ug/g		0.05	29-DEC-16
Bromomethane			<0.050		ug/g		0.05	29-DEC-16
Carbon tetrachloride			<0.050		ug/g		0.05	29-DEC-16
Chlorobenzene			<0.050		ug/g		0.05	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-1 MB								
Chloroform			<0.050		ug/g		0.05	29-DEC-16
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	29-DEC-16
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	29-DEC-16
Dibromochloromethane			<0.050		ug/g		0.05	29-DEC-16
Dichlorodifluoromethane			<0.050		ug/g		0.05	29-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	29-DEC-16
n-Hexane			<0.050		ug/g		0.05	29-DEC-16
Methylene Chloride			<0.050		ug/g		0.05	29-DEC-16
MTBE			<0.050		ug/g		0.05	29-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	29-DEC-16
Methyl Ethyl Ketone			<0.50		ug/g		0.5	29-DEC-16
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	29-DEC-16
o-Xylene			<0.020		ug/g		0.02	29-DEC-16
Styrene			<0.050		ug/g		0.05	29-DEC-16
Tetrachloroethylene			<0.050		ug/g		0.05	29-DEC-16
Toluene			<0.080		ug/g		0.08	29-DEC-16
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	29-DEC-16
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	29-DEC-16
Trichloroethylene			<0.010		ug/g		0.01	29-DEC-16
Trichlorofluoromethane			<0.050		ug/g		0.05	29-DEC-16
Vinyl chloride			<0.020		ug/g		0.02	29-DEC-16
Surrogate: 1,4-Difluorobenzene			107.5		%		50-140	29-DEC-16
Surrogate: 4-Bromofluorobenzene			99.6		%		50-140	29-DEC-16
WG2457612-5 MS		**WG2457612-3**						
1,1,1,2-Tetrachloroethane			98.7		%		50-140	29-DEC-16
1,1,2,2-Tetrachloroethane			115.5		%		50-140	29-DEC-16
1,1,1-Trichloroethane			97.5		%		50-140	29-DEC-16
1,1,2-Trichloroethane			108.8		%		50-140	29-DEC-16
1,1-Dichloroethane			103.1		%		50-140	29-DEC-16
1,1-Dichloroethylene			94.6		%		50-140	29-DEC-16
1,2-Dibromoethane			108.3		%		50-140	29-DEC-16
1,2-Dichlorobenzene			99.9		%		50-140	29-DEC-16
1,2-Dichloroethane			112.3		%		50-140	29-DEC-16
1,2-Dichloropropane			106.4		%		50-140	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624695								
WG2457612-5 MS		**WG2457612-3**						
1,3-Dichlorobenzene			93.0		%		50-140	29-DEC-16
1,4-Dichlorobenzene			95.2		%		50-140	29-DEC-16
Acetone			135.0		%		50-140	29-DEC-16
Benzene			102.5		%		50-140	29-DEC-16
Bromodichloromethane			103.5		%		50-140	29-DEC-16
Bromoform			112.0		%		50-140	29-DEC-16
Bromomethane			100.1		%		50-140	29-DEC-16
Carbon tetrachloride			93.5		%		50-140	29-DEC-16
Chlorobenzene			99.1		%		50-140	29-DEC-16
Chloroform			104.0		%		50-140	29-DEC-16
cis-1,2-Dichloroethylene			102.7		%		50-140	29-DEC-16
cis-1,3-Dichloropropene			110.9		%		50-140	29-DEC-16
Dibromochloromethane			109.9		%		50-140	29-DEC-16
Dichlorodifluoromethane			65.1		%		50-140	29-DEC-16
Ethylbenzene			90.5		%		50-140	29-DEC-16
n-Hexane			101.7		%		50-140	29-DEC-16
Methylene Chloride			107.1		%		50-140	29-DEC-16
MTBE			98.2		%		50-140	29-DEC-16
m+p-Xylenes			91.9		%		50-140	29-DEC-16
Methyl Ethyl Ketone			130.6		%		50-140	29-DEC-16
Methyl Isobutyl Ketone			124.7		%		50-140	29-DEC-16
o-Xylene			93.6		%		50-140	29-DEC-16
Styrene			98.1		%		50-140	29-DEC-16
Tetrachloroethylene			86.8		%		50-140	29-DEC-16
Toluene			95.2		%		50-140	29-DEC-16
trans-1,2-Dichloroethylene			97.2		%		50-140	29-DEC-16
trans-1,3-Dichloropropene			107.9		%		50-140	29-DEC-16
Trichloroethylene			94.7		%		50-140	29-DEC-16
Trichlorofluoromethane			97.6		%		50-140	29-DEC-16
Vinyl chloride			87.5		%		50-140	29-DEC-16

Quality Control Report

Workorder: L1873852 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

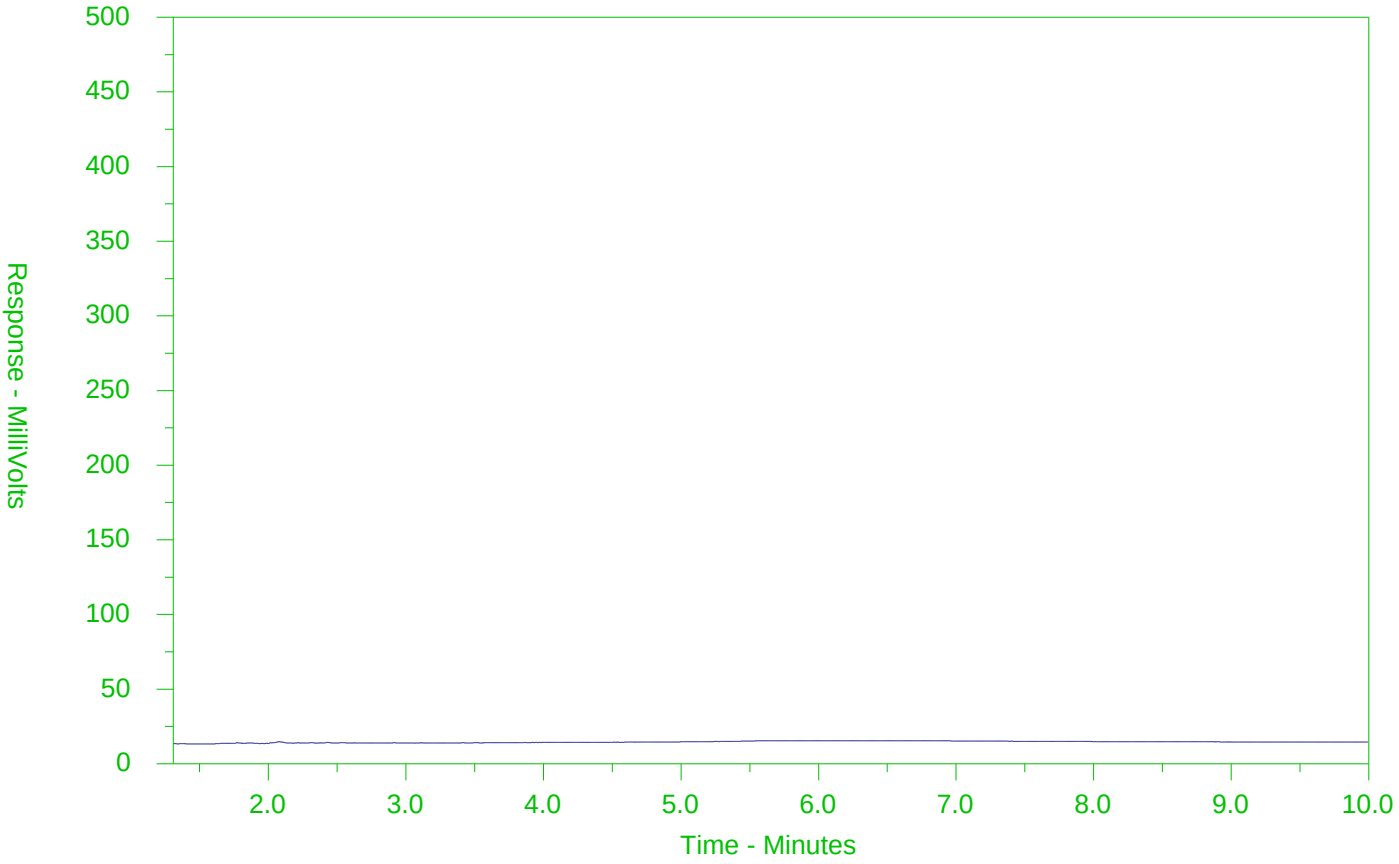
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873852-2
Client Sample ID: BH16-2 SA18



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1873852-COFC

COC Number: 14 - 447431

Page 1 of 1

Report To	
Company:	WSP Canada Inc
Contact:	Kathryn Maton
Address:	300-2611 Queensview Dr, Ottawa K2B 8K2
Phone:	613-617-9237

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☐ Yes ☐ No

☑ Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Kathryn.Maton@wspgroup.com

Email 2

Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)

- R ☑ Regular (Standard TAT if received by 3pm)
- P ☐ Priority (2-4 business days if received by 3pm)
- E ☐ Emergency (1-2 business days if received by 3pm)
- E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.

Specify Date Required for E2,E or P:

Invoice To: Same as Report To ☑ Yes ☐ No

Copy of Invoice with Report ☐ Yes ☐ No

Company:

Contact:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: Kathryn.Maton@wspgroup.com

Email 2: payables.ontario@wspgroup.com

Project Information

ALS Quote #:	25601/Quote # Q59797
Job #:	161-17230-00
PO / AFE:	N/A
LSD:	N/A

Oil and Gas Required Fields (client use)

Approver ID:	Cost Center:
GL Account:	Routing Code:
Activity Code:	
Location:	

ALS Lab Work Order # (lab use only): L1873852 Dec 28 AA

ALS Contact:

Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	O.Reg 153 Metals + Inorganics	O.Reg 153 VOCs	CCME PHC F1-F4 + BTEX	Number of Containers
1	BH16-2 SA 1B	22/12/16.	9am	Soil	X			
2	BH16-2 SA 18	↓	↓	↓			X	
3	BH16-2 SA 20	↓.	↓	↓.		X		

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ Yes ☑ No

Are samples for human drinking water use? ☐ Yes ☑ No

Special Instructions / Specify Criteria to add on report (client Use)

Table 2 SCI RPI

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐		SIF Observations	Yes ☐ No ☐
Ice packs Yes ☐	No ☐	Custody seal intact	Yes ☐ No ☐
Cooling Initiated ☐			

INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C

SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: [signature]	Date: 22/12/2016	Time:	Received by: [signature]	Date: 22/12/16	Time:	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

NA-FM-0326e v08 Front/03 October 2013

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WSP Canada Inc. (Ottawa)
ATTN: Kathryn Maton
2611 Queensview Dr
Suite 300
Ottawa ON K2B 8K2

Date Received: 22-DEC-16
Report Date: 03-JAN-17 15:30 (MT)
Version: FINAL

Client Phone: 613-829-2800

Certificate of Analysis

Lab Work Order #: L1873655

Project P.O. #: N/A
Job Reference: 161-17230-00
C of C Numbers:
Legal Site Desc: N/A

Emerson Perez, B.S.E
Account Manager

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873655-1	L1873655-2	L1873655-3	L1873655-4	L1873655-5	L1873655-6	L1873655-7
					Sampled Date	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16
					Sampled Time	09:00	09:00	09:00	13:00	13:00	13:00	13:00
					Sample ID	BH16-4 SA2	BH16-4 SA14	BH16-4 SA20	BH16-1 SA1B	BH16-1 SA14	BH16-1 SA20	BH16-1 SA21
Grouping	Analyte	Unit	Guide Limits #1	#2								
Physical Tests	Conductivity	mS/cm	0.7	0.7		0.147			0.414			
	% Moisture	%	-	-		16.3	16.3	15.3	8.25	8.58	6.47	6.36
	pH	pH units	-	-		5.70			7.63			
Cyanides	Cyanide, Weak Acid Diss	ug/g	0.051	0.051		<0.050			<0.050			
Saturated Paste Extractables	SAR	SAR	5	5		SAR:M 5.42			8.68			
	Calcium (Ca)	mg/L	-	-		1.5			4.2			
	Magnesium (Mg)	mg/L	-	-		<1.0			2.7			
	Sodium (Na)	mg/L	-	-		24.2			92.6			
Metals	Antimony (Sb)	ug/g	7.5	7.5		<1.0			<1.0			
	Arsenic (As)	ug/g	18	18		<1.0			2.2			
	Barium (Ba)	ug/g	390	390		63.1			70.8			
	Beryllium (Be)	ug/g	4	5		<0.50			<0.50			
	Boron (B)	ug/g	120	120		<5.0			<5.0			
	Boron (B), Hot Water Ext.	ug/g	1.5	1.5		0.18			0.28			
	Cadmium (Cd)	ug/g	1.2	1.2		<0.50			<0.50			
	Chromium (Cr)	ug/g	160	160		18.9			16.4			
	Cobalt (Co)	ug/g	22	22		5.6			4.8			
	Copper (Cu)	ug/g	140	180		6.3			9.5			
	Lead (Pb)	ug/g	120	120		4.8			30.3			
	Mercury (Hg)	ug/g	0.27	1.8		0.0266			0.0281			
	Molybdenum (Mo)	ug/g	6.9	6.9		<1.0			<1.0			
	Nickel (Ni)	ug/g	100	130		9.7			9.4			

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873655-1	L1873655-2	L1873655-3	L1873655-4	L1873655-5	L1873655-6	L1873655-7
					Sampled Date	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16
					Sampled Time	09:00	09:00	09:00	13:00	13:00	13:00	13:00
					Sample ID	BH16-4 SA2	BH16-4 SA14	BH16-4 SA20	BH16-1 SA1B	BH16-1 SA14	BH16-1 SA20	BH16-1 SA21
Grouping	Analyte	Unit	Guide Limits #1	#2								
Metals	Selenium (Se)	ug/g	2.4	2.4	<1.0			<1.0				
	Silver (Ag)	ug/g	20	25	<0.20			<0.20				
	Thallium (Tl)	ug/g	1	1	<0.50			<0.50				
	Uranium (U)	ug/g	23	23	<1.0			<1.0				
	Vanadium (V)	ug/g	86	86	30.6			29.1				
	Zinc (Zn)	ug/g	340	340	34.8			37.8				
Speciated Metals	Chromium, Hexavalent	ug/g	8	10	<0.20			<0.20				
Volatile Organic Compounds	Acetone	ug/g	16	28			<0.50					<0.50
	Benzene	ug/g	0.21	0.17		<0.0068	<0.0068		<0.0068	<0.0068	<0.0068	
	Bromodichloromethane	ug/g	1.5	1.9			<0.050					<0.050
	Bromoform	ug/g	0.27	0.26			<0.050					<0.050
	Bromomethane	ug/g	0.05	0.05			<0.050					<0.050
	Carbon tetrachloride	ug/g	0.05	0.12			<0.050					<0.050
	Chlorobenzene	ug/g	2.4	2.7			<0.050					<0.050
	Dibromochloromethane	ug/g	2.3	2.9			<0.050					<0.050
	Chloroform	ug/g	0.05	0.17			<0.050					<0.050
	1,2-Dibromoethane	ug/g	0.05	0.05			<0.050					<0.050
	1,2-Dichlorobenzene	ug/g	1.2	1.7			<0.050					<0.050
	1,3-Dichlorobenzene	ug/g	4.8	6			<0.050					<0.050
	1,4-Dichlorobenzene	ug/g	0.083	0.097			<0.050					<0.050
	Dichlorodifluoromethane	ug/g	16	25			<0.050					<0.050
	1,1-Dichloroethane	ug/g	0.47	0.6			<0.050					<0.050

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

ANALYTICAL REPORT

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873655-1	L1873655-2	L1873655-3	L1873655-4	L1873655-5	L1873655-6	L1873655-7
					Sampled Date	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16
					Sampled Time	09:00	09:00	09:00	13:00	13:00	13:00	13:00
					Sample ID	BH16-4 SA2	BH16-4 SA14	BH16-4 SA20	BH16-1 SA1B	BH16-1 SA14	BH16-1 SA20	BH16-1 SA21
Grouping	Analyte	Unit	Guide Limits #1	#2								
Volatile Organic Compounds	1,2-Dichloroethane	ug/g	0.05	0.05				<0.050				<0.050
	1,1-Dichloroethylene	ug/g	0.05	0.05				<0.050				<0.050
	cis-1,2-Dichloroethylene	ug/g	1.9	2.5				<0.050				<0.050
	trans-1,2-Dichloroethylene	ug/g	0.084	0.75				<0.050				<0.050
	Methylene Chloride	ug/g	0.1	0.96				<0.050				<0.050
	1,2-Dichloropropane	ug/g	0.05	0.085				<0.050				<0.050
	cis-1,3-Dichloropropene	ug/g	-	-				<0.030				<0.030
	trans-1,3-Dichloropropene	ug/g	-	-				<0.030				<0.030
	1,3-Dichloropropene (cis & trans)	ug/g	0.05	0.081				<0.042				<0.042
	Ethylbenzene	ug/g	1.1	1.6			<0.018	<0.018		<0.018	<0.018	<0.018
	n-Hexane	ug/g	2.8	34				<0.050				<0.050
	Methyl Ethyl Ketone	ug/g	16	44				<0.50				<0.50
	Methyl Isobutyl Ketone	ug/g	1.7	4.3				<0.50				<0.50
	MTBE	ug/g	0.75	1.4				<0.050				<0.050
	Styrene	ug/g	0.7	2.2				<0.050				<0.050
	1,1,1,2-Tetrachloroethane	ug/g	0.058	0.05				<0.050				<0.050
	1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05				<0.050				<0.050
	Tetrachloroethylene	ug/g	0.28	2.3				<0.050				<0.050
	Toluene	ug/g	2.3	6			<0.080	<0.080		<0.080	<0.080	<0.080
	1,1,1-Trichloroethane	ug/g	0.38	3.4				<0.050				<0.050
	1,1,2-Trichloroethane	ug/g	0.05	0.05				<0.050				<0.050
	Trichloroethylene	ug/g	0.061	0.52				<0.010				<0.010

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

SOIL - Ontario Regulation 153/04 - April 15, 2011 Standards

					ALS ID	L1873655-1	L1873655-2	L1873655-3	L1873655-4	L1873655-5	L1873655-6	L1873655-7
					Sampled Date	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16	21-DEC-16
					Sampled Time	09:00	09:00	09:00	13:00	13:00	13:00	13:00
					Sample ID	BH16-4 SA2	BH16-4 SA14	BH16-4 SA20	BH16-1 SA1B	BH16-1 SA14	BH16-1 SA20	BH16-1 SA21
Grouping	Analyte	Unit	Guide Limits #1	#2								
Volatile Organic Compounds	Trichlorofluoromethane	ug/g	4	5.8				<0.050				<0.050
	Vinyl chloride	ug/g	0.02	0.022				<0.020				<0.020
	o-Xylene	ug/g	-	-		<0.020	<0.020		<0.020	<0.020	<0.020	
	m+p-Xylenes	ug/g	-	-		<0.030	<0.030		<0.030	<0.030	<0.030	
	Xylenes (Total)	ug/g	3.1	25		<0.050	<0.050		<0.050	<0.050	<0.050	
	Surrogate: 4-Bromofluorobenzene	%	-	-		98.3	89.9		105.2	104.2	97.0	
	Surrogate: 1,4-Difluorobenzene	%	-	-		104.2	96.9		105.5	108.9	102.4	
Hydrocarbons	F1 (C6-C10)	ug/g	55	65		<5.0	<5.0		<5.0	<5.0		
	F1-BTEX	ug/g	55	65		<5.0	<5.0		<5.0	<5.0		
	F2 (C10-C16)	ug/g	98	150		<10	<10		16	<10		
	F3 (C16-C34)	ug/g	300	1300		<50	<50		<50	<50		
	F4 (C34-C50)	ug/g	2800	5600		<50	<50		<50	<50		
	Total Hydrocarbons (C6-C50)	ug/g	-	-		<72	<72		<72	<72		
	Chrom. to baseline at nC50		-	-		YES	YES		YES	YES		
	Surrogate: 2-Bromobenzotrifluoride	%	-	-		95.6	91.5		94.7	92.5		
	Surrogate: 3,4-Dichlorotoluene	%	-	-		94.3	89.4		93.9	96.4		

Guide Limit #1: T2-Soil-Res/Park/Inst. Property Use (Coarse)
Guide Limit #2: T2-Soil-Res/Park/Inst. Property Use (Fine)

Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
Analytical result for this parameter exceeds Guide Limits listed. See Summary of Guideline Exceedances.

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Summary of Guideline Exceedances

ALS ID	Client ID	Grouping	Analyte	Result	Guideline Limit	Unit
Guideline						
Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Coarse)						
L1873655-1	BH16-4 SA2	Saturated Paste Extractables	SAR	5.42	5	SAR
L1873655-4	BH16-1 SA1B	Saturated Paste Extractables	SAR	8.68	5	SAR
Ontario Regulation 153/04 - April 15, 2011 Standards - T2-Soil-Res/Park/Inst. Property Use (Fine)						
L1873655-1	BH16-4 SA2	Saturated Paste Extractables	SAR	5.42	5	SAR
L1873655-4	BH16-1 SA1B	Saturated Paste Extractables	SAR	8.68	5	SAR

* Please refer to the Reference Information section for an explanation of any qualifiers noted.

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
SAR:M	Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

BTX-511-HS-WT	Soil	BTEX-O.Reg 153/04 (July 2011)	SW846 8260

BTX is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-WAD-R511-WT	Soil	Cyanide (WAD)-O.Reg 153/04 (July 2011)	MOE 3015/APHA 4500CN I-WAD

The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-WT	Soil	Conductivity (EC)	MOEE E3138

A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Soil	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Soil	F2-F4-O.Reg 153/04 (July 2011)	MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by extracting a soil sample with a solvent mix. The solvent recovered from the extracted soil sample is dried and treated to remove polar material. The extract is analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-200.2-CVAA-WT	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-200.2-CCMS-WT	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Dried, ground and sieved soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-WT	Soil	pH	MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

SAR-R511-WT	Soil	SAR-O.Reg 153/04 (July 2011)	SW846 6010C

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Reference Information

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference**

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

**ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody Numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1873655 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	**Soil**							
Batch R3624834								
WG2457936-4 DUP		**L1873430-1**						
Boron (B), Hot Water Ext.		0.24	0.23		ug/g	6.8	30	29-DEC-16
WG2457936-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			91.9		%		70-130	29-DEC-16
WG2457936-3 LCS								
Boron (B), Hot Water Ext.			102.3		%		70-130	29-DEC-16
WG2457936-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	29-DEC-16
Batch R3625675								
WG2458475-4 DUP		**L1873786-4**						
Boron (B), Hot Water Ext.		0.24	0.24		ug/g	1.0	30	30-DEC-16
WG2458475-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			85.3		%		70-130	30-DEC-16
WG2458475-3 LCS								
Boron (B), Hot Water Ext.			100.6		%		70-130	30-DEC-16
WG2458475-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	30-DEC-16
BTX-511-HS-WT	**Soil**							
Batch R3624838								
WG2457455-4 DUP		**WG2457455-3**						
Benzene		0.0151	0.0148		ug/g	2.2	40	29-DEC-16
Ethylbenzene		0.043	0.041		ug/g	4.6	40	29-DEC-16
m+p-Xylenes		0.126	0.124		ug/g	1.5	40	29-DEC-16
o-Xylene		0.152	0.147		ug/g	3.7	40	29-DEC-16
Toluene		0.115	0.111		ug/g	4.0	40	29-DEC-16
WG2457455-2 LCS								
Benzene			106.4		%		70-130	29-DEC-16
Ethylbenzene			103.4		%		70-130	29-DEC-16
m+p-Xylenes			103.2		%		70-130	29-DEC-16
o-Xylene			99.6		%		70-130	29-DEC-16
Toluene			102.1		%		70-130	29-DEC-16
WG2457455-1 MB								
Benzene			<0.0068		ug/g		0.0068	29-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	29-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	29-DEC-16
o-Xylene			<0.020		ug/g		0.02	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
BTX-511-HS-WT	**Soil**							
Batch R3624838								
WG2457455-1 MB								
Toluene			<0.080		ug/g		0.08	29-DEC-16
Surrogate: 1,4-Difluorobenzene			110.1		%		50-140	29-DEC-16
Surrogate: 4-Bromofluorobenzene			102.6		%		50-140	29-DEC-16
WG2457455-5 MS		**WG2457455-3**						
Benzene			107.1		%		60-140	29-DEC-16
Ethylbenzene			110.9		%		60-140	29-DEC-16
m+p-Xylenes			107.9		%		60-140	29-DEC-16
o-Xylene			110.3		%		60-140	29-DEC-16
Toluene			114.5		%		60-140	29-DEC-16
CN-WAD-R511-WT	**Soil**							
Batch R3625540								
WG2457252-3 DUP		**L1873655-4**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	29-DEC-16
WG2457252-2 LCS								
Cyanide, Weak Acid Diss			103.4		%		80-120	29-DEC-16
WG2457252-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	29-DEC-16
WG2457252-4 MS		**L1873655-4**						
Cyanide, Weak Acid Diss			102.0		%		70-130	29-DEC-16
CR-CR6-IC-WT	**Soil**							
Batch R3625054								
WG2457251-3 CRM		**WT-SQC012**						
Chromium, Hexavalent			100.7		%		70-130	28-DEC-16
WG2457251-4 DUP		**L1873655-1**						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	28-DEC-16
WG2457251-2 LCS								
Chromium, Hexavalent			95.8		%		80-120	28-DEC-16
WG2457251-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	28-DEC-16
EC-WT	**Soil**							
Batch R3624954								
WG2457938-4 DUP		**WG2457938-3**						
Conductivity		0.147	0.151		mS/cm	2.7	20	29-DEC-16
WG2458155-1 LCS								
Conductivity			97.9		%		90-110	29-DEC-16
WG2457938-1 MB								

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
EC-WT	**Soil**							
Batch R3624954								
WG2457938-1 MB								
Conductivity			<0.0040		mS/cm		0.004	29-DEC-16
Batch R3625680								
WG2458476-4 DUP		**WG2458476-3**						
Conductivity		0.695	0.698		mS/cm	0.4	20	30-DEC-16
WG2458546-1 LCS								
Conductivity			105.0		%		90-110	30-DEC-16
WG2458476-1 MB								
Conductivity			<0.0040		mS/cm		0.004	30-DEC-16
F1-HS-511-WT	**Soil**							
Batch R3624653								
WG2457433-13 DUP		**WG2457433-12**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	29-DEC-16
WG2457433-11 LCS								
F1 (C6-C10)			89.0		%		80-120	28-DEC-16
WG2457433-10 MB								
F1 (C6-C10)			<5.0		ug/g		5	28-DEC-16
Surrogate: 3,4-Dichlorotoluene			104.7		%		60-140	28-DEC-16
WG2457433-16 MS		**WG2457433-15**						
F1 (C6-C10)			93.0		%		60-140	29-DEC-16
Batch R3624838								
WG2457455-4 DUP		**WG2457455-3**						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	29-DEC-16
WG2457455-2 LCS								
F1 (C6-C10)			89.7		%		80-120	29-DEC-16
WG2457455-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	29-DEC-16
Surrogate: 3,4-Dichlorotoluene			109.7		%		60-140	29-DEC-16
WG2457455-7 MS		**WG2457455-6**						
F1 (C6-C10)			70.2		%		60-140	29-DEC-16
F2-F4-511-WT	**Soil**							
Batch R3625528								
WG2457250-3 CRM		**ALS PHC2 IRM**						
F2 (C10-C16)			94.8		%		70-130	30-DEC-16
F3 (C16-C34)			101.8		%		70-130	30-DEC-16
F4 (C34-C50)			105.8		%		70-130	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	**Soil**							
Batch R3625528								
WG2457250-5 DUP		**WG2457250-4**						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	30-DEC-16
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	30-DEC-16
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	30-DEC-16
WG2457250-2 LCS								
F2 (C10-C16)			101.1		%		80-120	30-DEC-16
F3 (C16-C34)			107.5		%		80-120	30-DEC-16
F4 (C34-C50)			103.1		%		80-120	30-DEC-16
WG2457250-1 MB								
F2 (C10-C16)			<10		ug/g		10	30-DEC-16
F3 (C16-C34)			<50		ug/g		50	30-DEC-16
F4 (C34-C50)			<50		ug/g		50	30-DEC-16
Surrogate: 2-Bromobenzotrifluoride			86.5		%		60-140	30-DEC-16
HG-200.2-CVAA-WT	**Soil**							
Batch R3626839								
WG2458470-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			88.8		%		70-130	03-JAN-17
WG2458470-6 DUP		**WG2458470-5**						
Mercury (Hg)		0.0281	0.0269		ug/g	4.4	40	03-JAN-17
WG2458470-3 LCS								
Mercury (Hg)			100.0		%		80-120	03-JAN-17
WG2458470-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	03-JAN-17
MET-200.2-CCMS-WT	**Soil**							
Batch R3625673								
WG2458470-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			109.7		%		70-130	30-DEC-16
Arsenic (As)			120.8		%		70-130	30-DEC-16
Barium (Ba)			121.3		%		70-130	30-DEC-16
Beryllium (Be)			101.9		%		70-130	30-DEC-16
Cadmium (Cd)			109.4		%		70-130	30-DEC-16
Chromium (Cr)			124.7		%		70-130	30-DEC-16
Cobalt (Co)			117.3		%		70-130	30-DEC-16
Copper (Cu)			113.0		%		70-130	30-DEC-16
Lead (Pb)			99.3		%		70-130	30-DEC-16
Molybdenum (Mo)			102.4		%		70-130	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3625673								
WG2458470-2 CRM		**WT-CANMET-TILL1**						
Nickel (Ni)			116.1		%		70-130	30-DEC-16
Selenium (Se)			99.9		%		70-130	30-DEC-16
Silver (Ag)			103.9		%		70-130	30-DEC-16
Thallium (Tl)			108.5		%		70-130	30-DEC-16
Uranium (U)			116.2		%		70-130	30-DEC-16
Vanadium (V)			127.2		%		70-130	30-DEC-16
Zinc (Zn)			113.1		%		70-130	30-DEC-16
WG2458470-6 DUP		**WG2458470-5**						
Antimony (Sb)		0.13	0.12		ug/g	4.7	30	30-DEC-16
Arsenic (As)		2.16	2.20		ug/g	1.9	30	30-DEC-16
Barium (Ba)		70.8	74.3		ug/g	4.8	40	30-DEC-16
Beryllium (Be)		0.27	0.27		ug/g	1.3	30	30-DEC-16
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	30-DEC-16
Cadmium (Cd)		0.128	0.132		ug/g	3.3	30	30-DEC-16
Chromium (Cr)		16.4	15.9		ug/g	3.3	30	30-DEC-16
Cobalt (Co)		4.84	4.72		ug/g	2.6	30	30-DEC-16
Copper (Cu)		9.49	9.65		ug/g	1.7	30	30-DEC-16
Lead (Pb)		30.3	32.9		ug/g	8.2	40	30-DEC-16
Molybdenum (Mo)		0.24	0.27		ug/g	12	40	30-DEC-16
Nickel (Ni)		9.42	9.00		ug/g	4.5	30	30-DEC-16
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	30-DEC-16
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	30-DEC-16
Thallium (Tl)		0.089	0.090		ug/g	1.3	30	30-DEC-16
Uranium (U)		0.735	0.552		ug/g	29	30	30-DEC-16
Vanadium (V)		29.1	28.6		ug/g	1.6	30	30-DEC-16
Zinc (Zn)		37.8	37.5		ug/g	0.6	30	30-DEC-16
WG2458470-4 LCS								
Antimony (Sb)			100.7		%		80-120	30-DEC-16
Arsenic (As)			98.7		%		80-120	30-DEC-16
Barium (Ba)			98.6		%		80-120	30-DEC-16
Beryllium (Be)			93.3		%		80-120	30-DEC-16
Boron (B)			94.0		%		80-120	30-DEC-16
Cadmium (Cd)			93.3		%		80-120	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3625673								
WG2458470-4 LCS								
Chromium (Cr)			99.5		%		80-120	30-DEC-16
Cobalt (Co)			98.4		%		80-120	30-DEC-16
Copper (Cu)			96.9		%		80-120	30-DEC-16
Lead (Pb)			97.8		%		80-120	30-DEC-16
Molybdenum (Mo)			96.9		%		80-120	30-DEC-16
Nickel (Ni)			97.8		%		80-120	30-DEC-16
Selenium (Se)			94.6		%		80-120	30-DEC-16
Silver (Ag)			95.8		%		80-120	30-DEC-16
Thallium (Tl)			96.5		%		80-120	30-DEC-16
Uranium (U)			100.5		%		80-120	30-DEC-16
Vanadium (V)			101.9		%		80-120	30-DEC-16
Zinc (Zn)			92.0		%		80-120	30-DEC-16
WG2458470-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	30-DEC-16
Arsenic (As)			<0.10		mg/kg		0.1	30-DEC-16
Barium (Ba)			<0.50		mg/kg		0.5	30-DEC-16
Beryllium (Be)			<0.10		mg/kg		0.1	30-DEC-16
Boron (B)			<5.0		mg/kg		5	30-DEC-16
Cadmium (Cd)			<0.020		mg/kg		0.02	30-DEC-16
Chromium (Cr)			<0.50		mg/kg		0.5	30-DEC-16
Cobalt (Co)			<0.10		mg/kg		0.1	30-DEC-16
Copper (Cu)			<0.50		mg/kg		0.5	30-DEC-16
Lead (Pb)			<0.50		mg/kg		0.5	30-DEC-16
Molybdenum (Mo)			<0.10		mg/kg		0.1	30-DEC-16
Nickel (Ni)			<0.50		mg/kg		0.5	30-DEC-16
Selenium (Se)			<0.20		mg/kg		0.2	30-DEC-16
Silver (Ag)			<0.10		mg/kg		0.1	30-DEC-16
Thallium (Tl)			<0.050		mg/kg		0.05	30-DEC-16
Uranium (U)			<0.050		mg/kg		0.05	30-DEC-16
Vanadium (V)			<0.20		mg/kg		0.2	30-DEC-16
Zinc (Zn)			<2.0		mg/kg		2	30-DEC-16
MOISTURE-WT	**Soil**							

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-WT	**Soil**							
Batch R3623390								
WG2457178-3 DUP		**L1873655-2**						
% Moisture		16.3	16.2		%	0.4	20	24-DEC-16
WG2457178-2 LCS								
% Moisture			93.5		%		90-110	24-DEC-16
WG2457178-1 MB								
% Moisture			<0.10		%		0.1	24-DEC-16
PH-WT	**Soil**							
Batch R3624476								
WG2457261-1 DUP		**L1873655-4**						
pH		7.63	7.59	J	pH units	0.04	0.3	28-DEC-16
WG2457510-1 LCS								
pH			6.97		pH units		6.7-7.3	28-DEC-16
SAR-R511-WT	**Soil**							
Batch R3624843								
WG2457938-4 DUP		**WG2457938-3**						
Calcium (Ca)		1.5	1.5		mg/L	2.4	30	29-DEC-16
Sodium (Na)		25.0	24.2		mg/L	3.5	30	29-DEC-16
Magnesium (Mg)		<1.0	<1.0	RPD-NA	mg/L	N/A	30	29-DEC-16
WG2457938-2 IRM		**WT SAR1**						
Calcium (Ca)			118.4		%		70-130	29-DEC-16
Sodium (Na)			100.5		%		70-130	29-DEC-16
Magnesium (Mg)			117.7		%		70-130	29-DEC-16
WG2457938-1 MB								
Calcium (Ca)			<1.0		mg/L		1	29-DEC-16
Sodium (Na)			<1.0		mg/L		1	29-DEC-16
Magnesium (Mg)			<1.0		mg/L		1	29-DEC-16
Batch R3625676								
WG2458476-4 DUP		**WG2458476-3**						
Calcium (Ca)		18.6	18.4		mg/L	0.8	30	30-DEC-16
Sodium (Na)		105	104		mg/L	0.6	30	30-DEC-16
Magnesium (Mg)		3.2	3.2		mg/L	0.5	30	30-DEC-16
WG2458476-2 IRM		**WT SAR1**						
Calcium (Ca)			108.2		%		70-130	30-DEC-16
Sodium (Na)			95.3		%		70-130	30-DEC-16
Magnesium (Mg)			107.9		%		70-130	30-DEC-16
WG2458476-1 MB								

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SAR-R511-WT	**Soil**							
Batch R3625676								
WG2458476-1 MB								
Calcium (Ca)			<1.0		mg/L		1	30-DEC-16
Sodium (Na)			<1.0		mg/L		1	30-DEC-16
Magnesium (Mg)			<1.0		mg/L		1	30-DEC-16
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-13 DUP		**WG2457433-12**						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	29-DEC-16
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-13 DUP		**WG2457433-12**						
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	29-DEC-16
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	29-DEC-16
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	29-DEC-16
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	29-DEC-16
Trichloroethylene		0.048	0.050		ug/g	4.6	40	29-DEC-16
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	29-DEC-16
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	29-DEC-16
WG2457433-11 LCS								
1,1,1,2-Tetrachloroethane			95.9		%		60-130	28-DEC-16
1,1,2,2-Tetrachloroethane			112.2		%		60-130	28-DEC-16
1,1,1-Trichloroethane			94.4		%		60-130	28-DEC-16
1,1,2-Trichloroethane			107.8		%		60-130	28-DEC-16
1,1-Dichloroethane			99.99		%		60-130	28-DEC-16
1,1-Dichloroethylene			92.1		%		60-130	28-DEC-16
1,2-Dibromoethane			107.8		%		70-130	28-DEC-16
1,2-Dichlorobenzene			97.4		%		70-130	28-DEC-16
1,2-Dichloroethane			112.0		%		60-130	28-DEC-16
1,2-Dichloropropane			104.3		%		70-130	28-DEC-16
1,3-Dichlorobenzene			93.5		%		70-130	28-DEC-16
1,4-Dichlorobenzene			96.3		%		70-130	28-DEC-16
Acetone			133.5		%		60-140	28-DEC-16
Benzene			99.8		%		70-130	28-DEC-16
Bromodichloromethane			101.7		%		50-140	28-DEC-16
Bromoform			110.7		%		70-130	28-DEC-16
Bromomethane			99.3		%		50-140	28-DEC-16
Carbon tetrachloride			90.5		%		70-130	28-DEC-16
Chlorobenzene			97.7		%		70-130	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-11 LCS								
Chloroform			101.3		%		70-130	28-DEC-16
cis-1,2-Dichloroethylene			100.6		%		70-130	28-DEC-16
cis-1,3-Dichloropropene			114.9		%		70-130	28-DEC-16
Dibromochloromethane			108.4		%		60-130	28-DEC-16
Dichlorodifluoromethane			62.7		%		50-140	28-DEC-16
Ethylbenzene			90.0		%		70-130	28-DEC-16
n-Hexane			97.6		%		70-130	28-DEC-16
Methylene Chloride			105.6		%		70-130	28-DEC-16
MTBE			95.9		%		70-130	28-DEC-16
m+p-Xylenes			91.5		%		70-130	28-DEC-16
Methyl Ethyl Ketone			127.6		%		60-140	28-DEC-16
Methyl Isobutyl Ketone			123.8		%		60-140	28-DEC-16
o-Xylene			92.8		%		70-130	28-DEC-16
Styrene			98.4		%		70-130	28-DEC-16
Tetrachloroethylene			87.6		%		60-130	28-DEC-16
Toluene			93.3		%		70-130	28-DEC-16
trans-1,2-Dichloroethylene			97.6		%		60-130	28-DEC-16
trans-1,3-Dichloropropene			113.2		%		70-130	28-DEC-16
Trichloroethylene			93.9		%		60-130	28-DEC-16
Trichlorofluoromethane			94.0		%		50-140	28-DEC-16
Vinyl chloride			85.7		%		60-140	28-DEC-16
WG2457433-10 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,1-Trichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,2-Trichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1-Dichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
1,2-Dibromoethane			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichloropropane			<0.050		ug/g		0.05	28-DEC-16
1,3-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16
1,4-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16

Quality Control Report

Workorder: L1873655 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-10 MB								
Acetone			<0.50		ug/g		0.5	28-DEC-16
Benzene			<0.0068		ug/g		0.0068	28-DEC-16
Bromodichloromethane			<0.050		ug/g		0.05	28-DEC-16
Bromoform			<0.050		ug/g		0.05	28-DEC-16
Bromomethane			<0.050		ug/g		0.05	28-DEC-16
Carbon tetrachloride			<0.050		ug/g		0.05	28-DEC-16
Chlorobenzene			<0.050		ug/g		0.05	28-DEC-16
Chloroform			<0.050		ug/g		0.05	28-DEC-16
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	28-DEC-16
Dibromochloromethane			<0.050		ug/g		0.05	28-DEC-16
Dichlorodifluoromethane			<0.050		ug/g		0.05	28-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	28-DEC-16
n-Hexane			<0.050		ug/g		0.05	28-DEC-16
Methylene Chloride			<0.050		ug/g		0.05	28-DEC-16
MTBE			<0.050		ug/g		0.05	28-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	28-DEC-16
Methyl Ethyl Ketone			<0.50		ug/g		0.5	28-DEC-16
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	28-DEC-16
o-Xylene			<0.020		ug/g		0.02	28-DEC-16
Styrene			<0.050		ug/g		0.05	28-DEC-16
Tetrachloroethylene			<0.050		ug/g		0.05	28-DEC-16
Toluene			<0.080		ug/g		0.08	28-DEC-16
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	28-DEC-16
Trichloroethylene			<0.010		ug/g		0.01	28-DEC-16
Trichlorofluoromethane			<0.050		ug/g		0.05	28-DEC-16
Vinyl chloride			<0.020		ug/g		0.02	28-DEC-16
Surrogate: 1,4-Difluorobenzene			119.9		%		50-140	28-DEC-16
Surrogate: 4-Bromofluorobenzene			109.5		%		50-140	28-DEC-16
WG2457433-14 MS		**WG2457433-12**						
1,1,1,2-Tetrachloroethane			95.5		%		50-140	29-DEC-16
1,1,2,2-Tetrachloroethane			104.8		%		50-140	29-DEC-16
1,1,1-Trichloroethane			96.6		%		50-140	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-14 MS		**WG2457433-12**						
1,1,2-Trichloroethane			104.3		%		50-140	29-DEC-16
1,1-Dichloroethane			100.5		%		50-140	29-DEC-16
1,1-Dichloroethylene			95.1		%		50-140	29-DEC-16
1,2-Dibromoethane			103.8		%		50-140	29-DEC-16
1,2-Dichlorobenzene			98.7		%		50-140	29-DEC-16
1,2-Dichloroethane			108.8		%		50-140	29-DEC-16
1,2-Dichloropropane			102.9		%		50-140	29-DEC-16
1,3-Dichlorobenzene			95.5		%		50-140	29-DEC-16
1,4-Dichlorobenzene			97.8		%		50-140	29-DEC-16
Acetone			131.8		%		50-140	29-DEC-16
Benzene			100.0		%		50-140	29-DEC-16
Bromodichloromethane			99.5		%		50-140	29-DEC-16
Bromoform			105.1		%		50-140	29-DEC-16
Bromomethane			101.9		%		50-140	29-DEC-16
Carbon tetrachloride			93.3		%		50-140	29-DEC-16
Chlorobenzene			97.5		%		50-140	29-DEC-16
Chloroform			101.5		%		50-140	29-DEC-16
cis-1,2-Dichloroethylene			100.9		%		50-140	29-DEC-16
cis-1,3-Dichloropropene			109.5		%		50-140	29-DEC-16
Dibromochloromethane			105.4		%		50-140	29-DEC-16
Dichlorodifluoromethane			73.3		%		50-140	29-DEC-16
Ethylbenzene			91.1		%		50-140	29-DEC-16
n-Hexane			104.2		%		50-140	29-DEC-16
Methylene Chloride			105.7		%		50-140	29-DEC-16
MTBE			95.4		%		50-140	29-DEC-16
m+p-Xylenes			92.5		%		50-140	29-DEC-16
Methyl Ethyl Ketone			117.2		%		50-140	29-DEC-16
Methyl Isobutyl Ketone			110.2		%		50-140	29-DEC-16
o-Xylene			92.5		%		50-140	29-DEC-16
Styrene			96.5		%		50-140	29-DEC-16
Tetrachloroethylene			90.3		%		50-140	29-DEC-16
Toluene			94.0		%		50-140	29-DEC-16
trans-1,2-Dichloroethylene			98.7		%		50-140	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624653								
WG2457433-14 MS		**WG2457433-12**						
trans-1,3-Dichloropropene			107.7		%		50-140	29-DEC-16
Trichloroethylene			95.2		%		50-140	29-DEC-16
Trichlorofluoromethane			99.0		%		50-140	29-DEC-16
Vinyl chloride			90.5		%		50-140	29-DEC-16

Quality Control Report

Workorder: L1873655 Report Date: 03-JAN-17

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

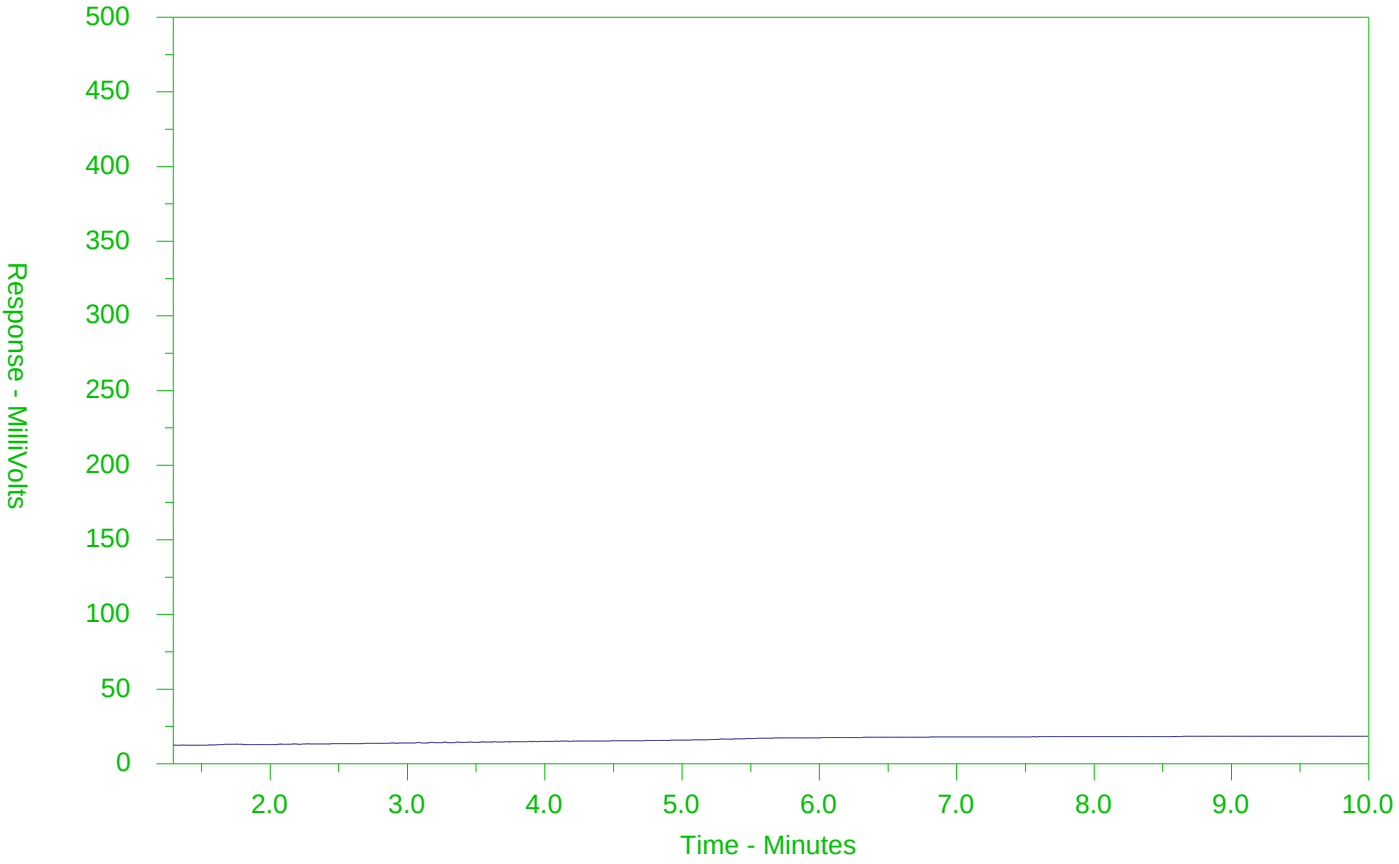
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873655-2
Client Sample ID: BH16-4 SA14



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

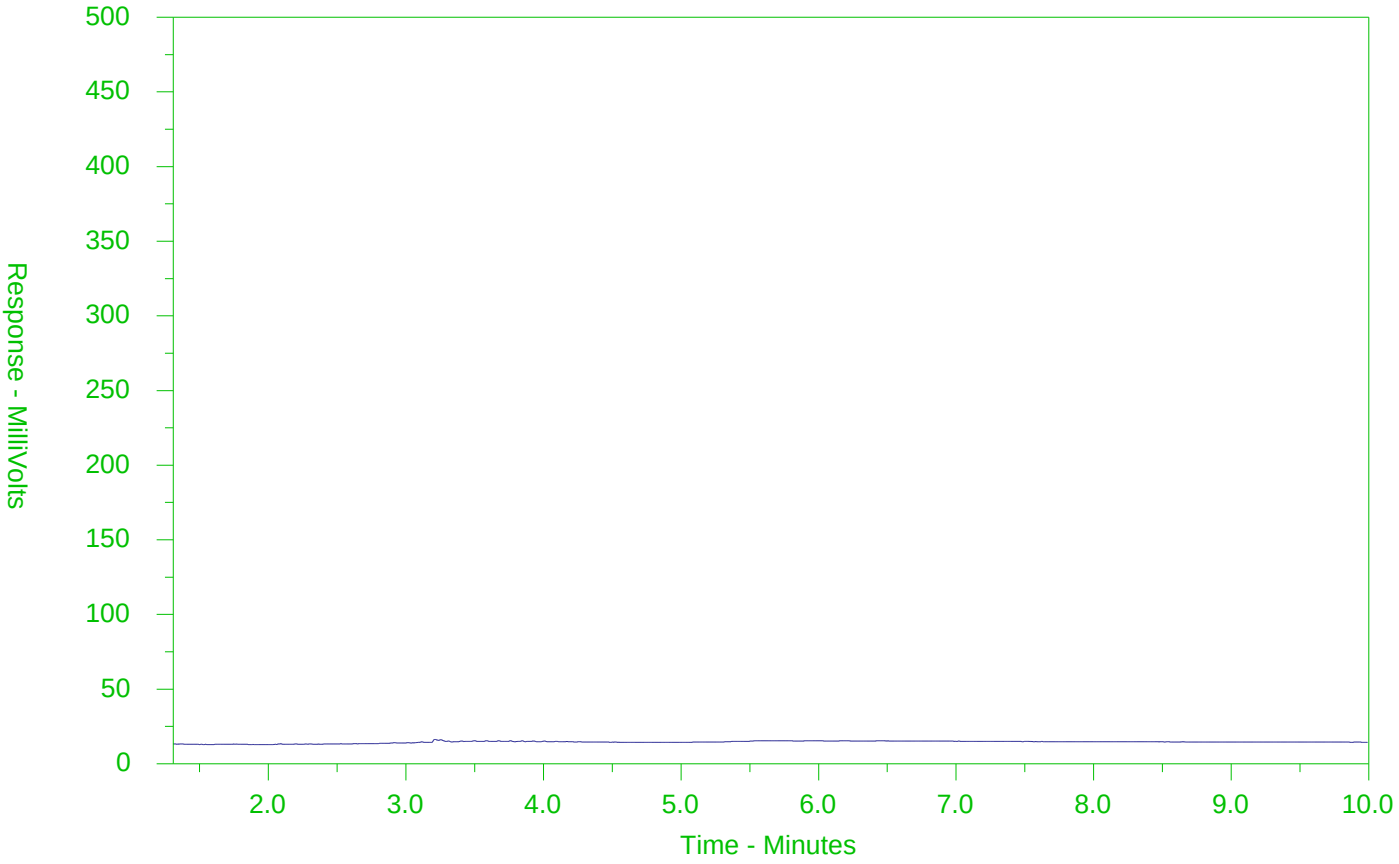
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873655-3
Client Sample ID: BH16-4 SA20



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

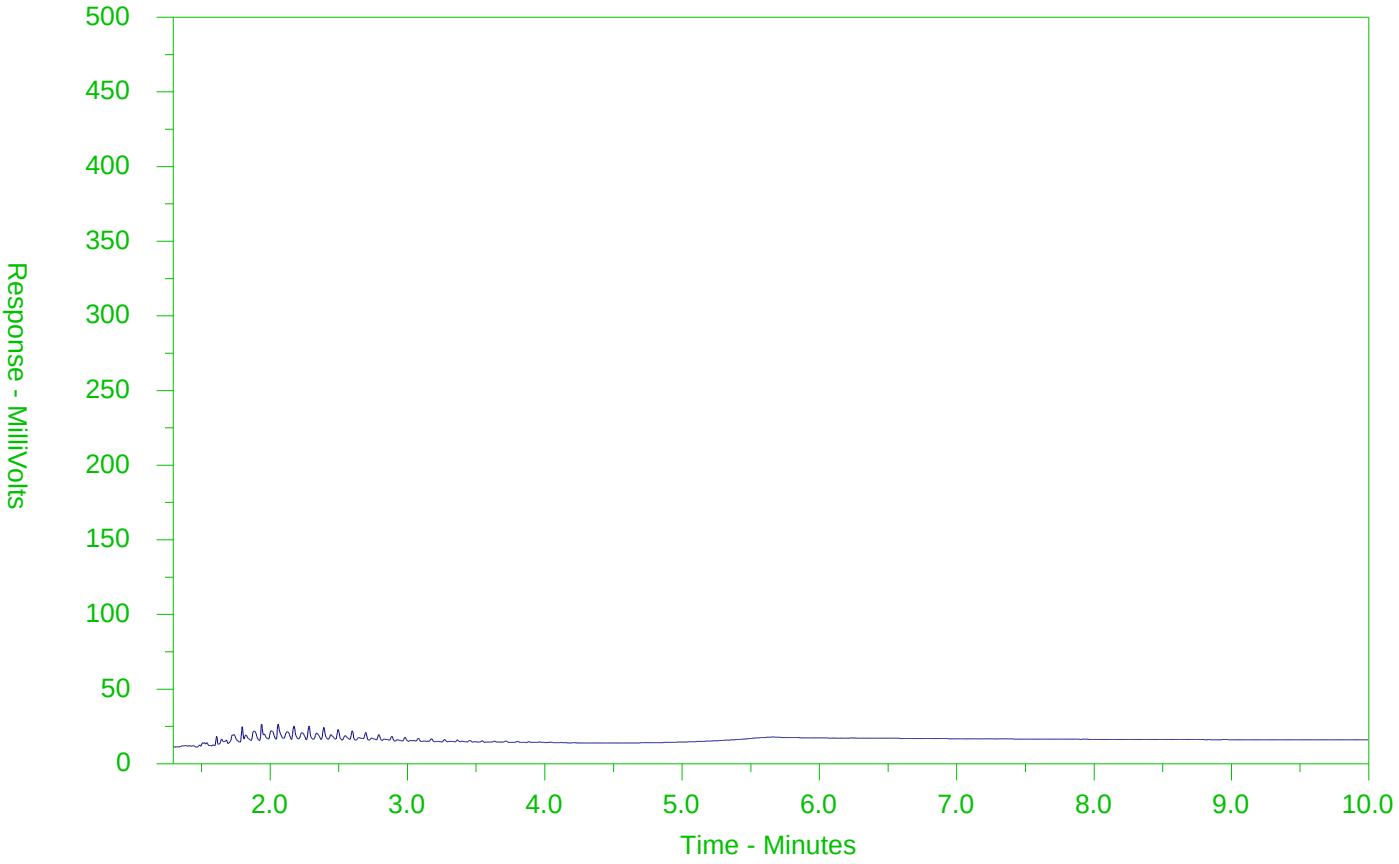
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873655-5
Client Sample ID: BH16-1 SA14



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

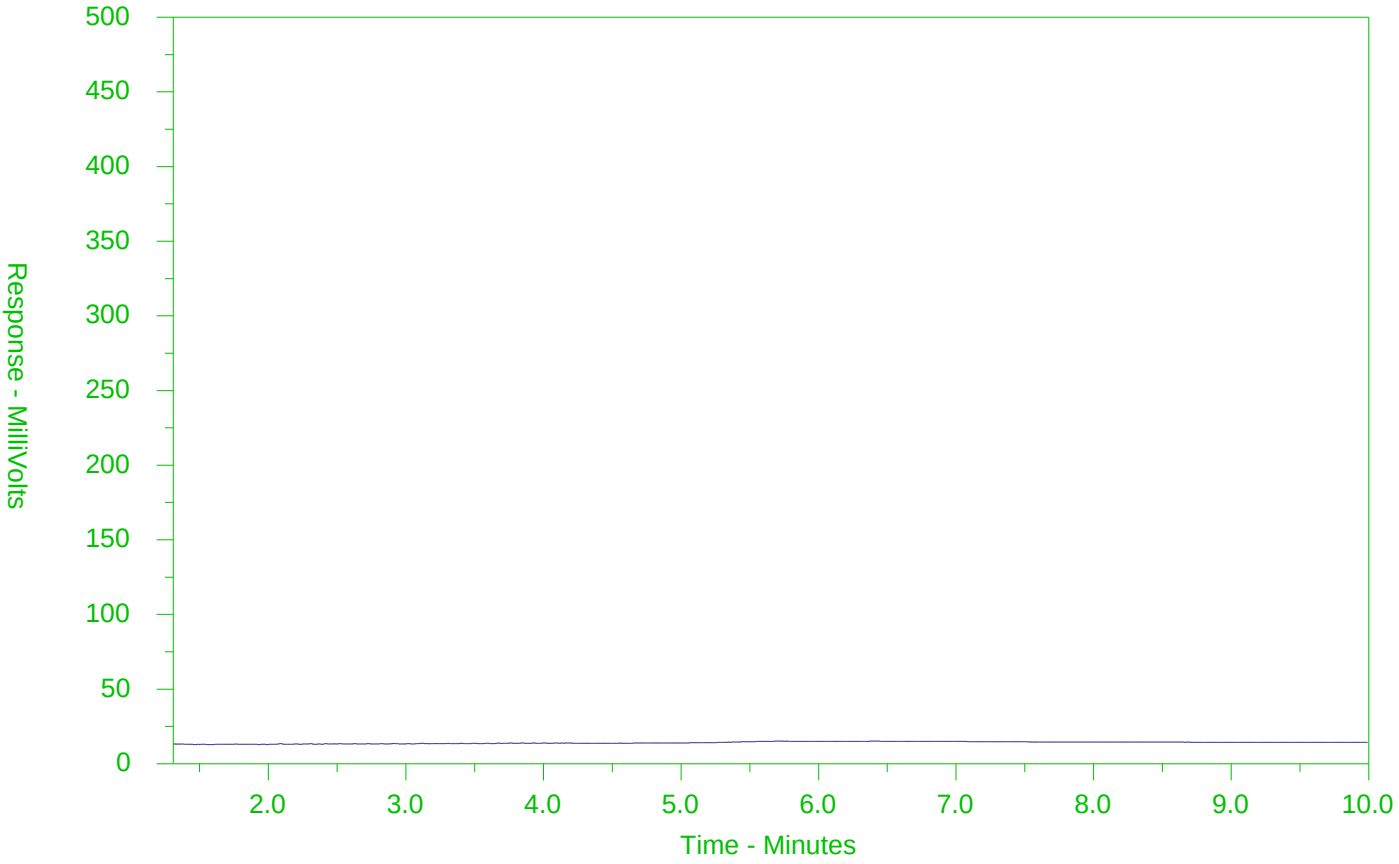
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873655-6
Client Sample ID: BH16-1 SA20



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1873655-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	WSP Canada Inc. (Ottawa)
Contact:	Kathryn Maton
Phone:	(613) 617-9237
	Company address below will appear on the final report
Street:	2611 Queensview Drive, Suite 300
City/Province:	Ottawa, ON
Postal Code:	K2B 8K2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Dis.

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☐ YES ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: kathryn.Maton@wspgroup.com
Email 2:
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: kathryn.Maton@wspgroup.com
Email 2: payables.ontario@wspgroup.com

Project Information

ALS Account # / Quote #:	25601 / Quote Q59797
Job #:	161-17230-00
PO / AFE:	n/a
LSD:	n/a SH

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L1873655 23B
ALS Contact: E. Perez
Sampler:

E&P TATs with your AM - surcharges will apply

Regular [R] ☐ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐
EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals and Inorganics	VOCs	BTEX, F1-F4	PAHs	Number of Containers
1	BH16-4 SA FB 2	21/12/16	9am	Soil	X				1
2	BH16-4 SA 14	↓	↓	↓			X		3
3	BH16-4 SA 20					X	X		3
4	BH16-1 SA 1 B		1pm		X				1
5	BH16-1 SA 14		↓				X		3
6	BH16-1 SA 20						X		3
7	BH16-1 SA 21					X			3

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO
Are samples for human drinking water use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Compare against ON Reg. 153/04 Table ____ RPI / ICC (circle one)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.3			7.1		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: KMaton	Date: 21/12/2016	Time: 5pm	Received by:	Date: 22/12/16	Time: 9:00	Received by:	Date: 23/12/16	Time: 10:00

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

SIF

PM

WSP Canada Inc. (Ottawa)
ATTN: Kathryn Maton
2611 Queensview Dr
Suite 300
Ottawa ON K2B 8K2

Date Received: 21-DEC-16
Report Date: 29-DEC-16 15:16 (MT)
Version: FINAL

Client Phone: 613-829-2800

Certificate of Analysis

Lab Work Order #: L1873087

Project P.O. #: NOT SUBMITTED
Job Reference: 161-17230-00
C of C Numbers:
Legal Site Desc:

Emerson Perez, B.S.E
Account Manager

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-1 BH16-3 SA2									
Sampled By: KM on 20-DEC-16 @ 13:00									
Matrix: SOIL									
Physical Tests									
Conductivity	0.123		0.0040	mS/cm	28-DEC-16	1.4	1.4	0.7	0.7
% Moisture	16.4		0.10	%	22-DEC-16				
pH	7.15		0.10	pH units	23-DEC-16				
Cyanides									
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	28-DEC-16	0.051	0.051	0.051	0.051
Saturated Paste Extractables									
SAR	0.26	SAR:M	0.10	SAR	28-DEC-16	12	12	5	5
Calcium (Ca)	6.2		1.0	mg/L	28-DEC-16				
Magnesium (Mg)	<1.0		1.0	mg/L	28-DEC-16				
Sodium (Na)	2.4		1.0	mg/L	28-DEC-16				
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	29-DEC-16	40	50	7.5	7.5
Arsenic (As)	1.2		1.0	ug/g	29-DEC-16	18	18	18	18
Barium (Ba)	64.4		1.0	ug/g	29-DEC-16	670	670	390	390
Beryllium (Be)	<0.50		0.50	ug/g	29-DEC-16	8	10	4	5
Boron (B)	<5.0		5.0	ug/g	29-DEC-16	120	120	120	120
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	29-DEC-16	2	2	1.5	1.5
Cadmium (Cd)	<0.50		0.50	ug/g	29-DEC-16	1.9	1.9	1.2	1.2
Chromium (Cr)	18.7		1.0	ug/g	29-DEC-16	160	160	160	160
Cobalt (Co)	5.7		1.0	ug/g	29-DEC-16	80	100	22	22
Copper (Cu)	8.8		1.0	ug/g	29-DEC-16	230	300	140	180
Lead (Pb)	4.1		1.0	ug/g	29-DEC-16	120	120	120	120
Mercury (Hg)	0.0119		0.0050	ug/g	29-DEC-16	3.9	20	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	29-DEC-16	40	40	6.9	6.9
Nickel (Ni)	10.9		1.0	ug/g	29-DEC-16	270	340	100	130
Selenium (Se)	<1.0		1.0	ug/g	29-DEC-16	5.5	5.5	2.4	2.4
Silver (Ag)	<0.20		0.20	ug/g	29-DEC-16	40	50	20	25
Thallium (Tl)	<0.50		0.50	ug/g	29-DEC-16	3.3	3.3	1	1
Uranium (U)	<1.0		1.0	ug/g	29-DEC-16	33	33	23	23
Vanadium (V)	33.1		1.0	ug/g	29-DEC-16	86	86	86	86
Zinc (Zn)	20.6		5.0	ug/g	29-DEC-16	340	340	340	340
Speciated Metals									
Chromium, Hexavalent	0.62		0.20	ug/g	23-DEC-16	8	10	8	10
L1873087-2 BH16-3 SA102									
Sampled By: KM on 20-DEC-16 @ 13:00									
Matrix: SOIL									
Physical Tests									
Conductivity	0.142		0.0040	mS/cm	28-DEC-16	1.4	1.4	0.7	0.7
% Moisture	13.0		0.10	%	22-DEC-16				
pH	7.29		0.10	pH units	23-DEC-16				
Cyanides									
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	28-DEC-16	0.051	0.051	0.051	0.051
Saturated Paste Extractables									
SAR	0.30	SAR:M	0.10	SAR	28-DEC-16	12	12	5	5

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-2 BH16-3 SA102									
Sampled By: KM on 20-DEC-16 @ 13:00									
Matrix: SOIL									
Saturated Paste Extractables									
Calcium (Ca)	7.8		1.0	mg/L	28-DEC-16				
Magnesium (Mg)	<1.0		1.0	mg/L	28-DEC-16				
Sodium (Na)	3.0		1.0	mg/L	28-DEC-16				
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	29-DEC-16	40	50	7.5	7.5
Arsenic (As)	1.6		1.0	ug/g	29-DEC-16	18	18	18	18
Barium (Ba)	45.1		1.0	ug/g	29-DEC-16	670	670	390	390
Beryllium (Be)	<0.50		0.50	ug/g	29-DEC-16	8	10	4	5
Boron (B)	<5.0		5.0	ug/g	29-DEC-16	120	120	120	120
Boron (B), Hot Water Ext.	<0.10		0.10	ug/g	29-DEC-16	2	2	1.5	1.5
Cadmium (Cd)	<0.50		0.50	ug/g	29-DEC-16	1.9	1.9	1.2	1.2
Chromium (Cr)	21.3		1.0	ug/g	29-DEC-16	160	160	160	160
Cobalt (Co)	6.2		1.0	ug/g	29-DEC-16	80	100	22	22
Copper (Cu)	8.1		1.0	ug/g	29-DEC-16	230	300	140	180
Lead (Pb)	6.2		1.0	ug/g	29-DEC-16	120	120	120	120
Mercury (Hg)	0.0210		0.0050	ug/g	29-DEC-16	3.9	20	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	29-DEC-16	40	40	6.9	6.9
Nickel (Ni)	12.1		1.0	ug/g	29-DEC-16	270	340	100	130
Selenium (Se)	<1.0		1.0	ug/g	29-DEC-16	5.5	5.5	2.4	2.4
Silver (Ag)	<0.20		0.20	ug/g	29-DEC-16	40	50	20	25
Thallium (Tl)	<0.50		0.50	ug/g	29-DEC-16	3.3	3.3	1	1
Uranium (U)	<1.0		1.0	ug/g	29-DEC-16	33	33	23	23
Vanadium (V)	34.9		1.0	ug/g	29-DEC-16	86	86	86	86
Zinc (Zn)	25.8		5.0	ug/g	29-DEC-16	340	340	340	340
Speciated Metals									
Chromium, Hexavalent	0.20		0.20	ug/g	23-DEC-16	8	10	8	10
L1873087-3 BH16-3 SA19									
Sampled By: KM on 20-DEC-16 @ 13:00									
Matrix: SOIL						#1	#2	#3	#4
Physical Tests									
% Moisture	6.84		0.10	%	22-DEC-16				
Volatile Organic Compounds									
Acetone	<0.50		0.50	ug/g	28-DEC-16	16	28	16	28
Benzene	<0.0068		0.0068	ug/g	28-DEC-16	0.32	0.4	0.21	0.17
Bromodichloromethane	<0.050		0.050	ug/g	28-DEC-16	1.5	1.9	1.5	1.9
Bromoform	<0.050		0.050	ug/g	28-DEC-16	0.61	1.7	0.27	0.26
Bromomethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	28-DEC-16	0.21	0.71	0.05	0.12
Chlorobenzene	<0.050		0.050	ug/g	28-DEC-16	2.4	2.7	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	28-DEC-16	2.3	2.9	2.3	2.9
Chloroform	<0.050		0.050	ug/g	28-DEC-16	0.47	0.18	0.05	0.17
1,2-Dibromoethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	1.2	1.7	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	9.6	12	4.8	6

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-3 BH16-3 SA19									
Sampled By: KM on 20-DEC-16 @ 13:00									
Matrix: SOIL									
Volatile Organic Compounds									
1,4-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	0.2	0.57	0.083	0.097
Dichlorodifluoromethane	<0.050		0.050	ug/g	28-DEC-16	16	25	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.47	0.6	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	0.064	0.48	0.05	0.05
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.3	2.5	0.084	0.75
Methylene Chloride	<0.050		0.050	ug/g	28-DEC-16	1.6	2	0.1	0.96
1,2-Dichloropropane	<0.050		0.050	ug/g	28-DEC-16	0.16	0.68	0.05	0.085
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	29-DEC-16	0.059	0.081	0.05	0.081
Ethylbenzene	<0.018		0.018	ug/g	28-DEC-16	1.1	1.6	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	28-DEC-16	46	88	2.8	34
Methyl Ethyl Ketone	<0.50		0.50	ug/g	28-DEC-16	70	88	16	44
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	28-DEC-16	31	210	1.7	4.3
MTBE	<0.050		0.050	ug/g	28-DEC-16	1.6	2.3	0.75	1.4
Styrene	<0.050		0.050	ug/g	28-DEC-16	34	43	0.7	2.2
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.087	0.11	0.058	0.05
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.094	0.05	0.05
Tetrachloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	0.28	2.3
Toluene	<0.080		0.080	ug/g	28-DEC-16	6.4	9	2.3	6
1,1,1-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	6.1	12	0.38	3.4
1,1,2-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.11	0.05	0.05
Trichloroethylene	<0.010		0.010	ug/g	28-DEC-16	0.55	0.61	0.061	0.52
Trichlorofluoromethane	<0.050		0.050	ug/g	28-DEC-16	4	5.8	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	28-DEC-16	0.032	0.25	0.02	0.022
o-Xylene	<0.020		0.020	ug/g	28-DEC-16				
m+p-Xylenes	<0.030		0.030	ug/g	28-DEC-16				
Xylenes (Total)	<0.050		0.050	ug/g	29-DEC-16	26	30	3.1	25
Surrogate: 4-Bromofluorobenzene	102.0		50-140	%	28-DEC-16				
Surrogate: 1,4-Difluorobenzene	106.2		50-140	%	28-DEC-16				
Hydrocarbons									
F1 (C6-C10)	<5.0		5.0	ug/g	28-DEC-16	55	65	55	65
F1-BTEX	<5.0		5.0	ug/g	29-DEC-16	55	65	55	65
F2 (C10-C16)	<10		10	ug/g	23-DEC-16	230	250	98	150
F3 (C16-C34)	<50		50	ug/g	23-DEC-16	1700	2500	300	1300
F4 (C34-C50)	<50		50	ug/g	23-DEC-16	3300	6600	2800	5600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	29-DEC-16				
Chrom. to baseline at nC50	YES			No Unit	23-DEC-16				
Surrogate: 2-Bromobenzotrifluoride	88.5		60-140	%	23-DEC-16				
Surrogate: 3,4-Dichlorotoluene	100.7		60-140	%	28-DEC-16				
L1873087-4 BH16-5 SA1B									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL						#1	#2	#3	#4

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-4 BH16-5 SA1B									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Physical Tests									
Conductivity	0.192		0.0040	mS/cm	28-DEC-16	1.4	1.4	0.7	0.7
% Moisture	9.62		0.10	%	22-DEC-16				
pH	7.27		0.10	pH units	23-DEC-16				
Cyanides									
Cyanide, Weak Acid Diss	<0.050		0.050	ug/g	28-DEC-16	0.051	0.051	0.051	0.051
Saturated Paste Extractables									
SAR	5.95	SAR:M	0.10	SAR	28-DEC-16	12	12	*5	*5
Calcium (Ca)	2.3		1.0	mg/L	28-DEC-16				
Magnesium (Mg)	<1.0		1.0	mg/L	28-DEC-16				
Sodium (Na)	32.8		1.0	mg/L	28-DEC-16				
Metals									
Antimony (Sb)	<1.0		1.0	ug/g	29-DEC-16	40	50	7.5	7.5
Arsenic (As)	2.3		1.0	ug/g	29-DEC-16	18	18	18	18
Barium (Ba)	60.7		1.0	ug/g	29-DEC-16	670	670	390	390
Beryllium (Be)	<0.50		0.50	ug/g	29-DEC-16	8	10	4	5
Boron (B)	<5.0		5.0	ug/g	29-DEC-16	120	120	120	120
Boron (B), Hot Water Ext.	0.24		0.10	ug/g	29-DEC-16	2	2	1.5	1.5
Cadmium (Cd)	<0.50		0.50	ug/g	29-DEC-16	1.9	1.9	1.2	1.2
Chromium (Cr)	14.1		1.0	ug/g	29-DEC-16	160	160	160	160
Cobalt (Co)	4.5		1.0	ug/g	29-DEC-16	80	100	22	22
Copper (Cu)	15.7		1.0	ug/g	29-DEC-16	230	300	140	180
Lead (Pb)	49.8		1.0	ug/g	29-DEC-16	120	120	120	120
Mercury (Hg)	0.0746		0.0050	ug/g	29-DEC-16	3.9	20	0.27	1.8
Molybdenum (Mo)	<1.0		1.0	ug/g	29-DEC-16	40	40	6.9	6.9
Nickel (Ni)	8.1		1.0	ug/g	29-DEC-16	270	340	100	130
Selenium (Se)	<1.0		1.0	ug/g	29-DEC-16	5.5	5.5	2.4	2.4
Silver (Ag)	<0.20		0.20	ug/g	29-DEC-16	40	50	20	25
Thallium (Tl)	<0.50		0.50	ug/g	29-DEC-16	3.3	3.3	1	1
Uranium (U)	<1.0		1.0	ug/g	29-DEC-16	33	33	23	23
Vanadium (V)	25.8		1.0	ug/g	29-DEC-16	86	86	86	86
Zinc (Zn)	41.0		5.0	ug/g	29-DEC-16	340	340	340	340
Speciated Metals									
Chromium, Hexavalent	<0.20		0.20	ug/g	23-DEC-16	8	10	8	10
L1873087-5 BH16-5 SA5									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Physical Tests									
% Moisture	13.0		0.10	%	22-DEC-16				
Volatile Organic Compounds									
Benzene	<0.0068		0.0068	ug/g	23-DEC-16	0.32	0.4	0.21	0.17
Ethylbenzene	<0.018		0.018	ug/g	23-DEC-16	1.1	1.6	1.1	1.6
Toluene	<0.080		0.080	ug/g	23-DEC-16	6.4	9	2.3	6
o-Xylene	<0.020		0.020	ug/g	23-DEC-16				
m+p-Xylenes	<0.030		0.030	ug/g	23-DEC-16				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L1873087-5	BH16-5 SA5									
Sampled By:	KM on 20-DEC-16 @ 09:00									
Matrix:	SOIL						#1	#2	#3	#4
Volatile Organic Compounds										
	Xylenes (Total)	<0.050		0.050	ug/g	23-DEC-16	26	30	3.1	25
	Surrogate: 4-Bromofluorobenzene	146.6	SURR-ND	50-140	%	23-DEC-16				
	Surrogate: 1,4-Difluorobenzene	141.1	SURR-ND	50-140	%	23-DEC-16				
Hydrocarbons										
	F1 (C6-C10)	<5.0		5.0	ug/g	23-DEC-16	55	65	55	65
	F1-BTEX	<5.0		5.0	ug/g	28-DEC-16	55	65	55	65
	F2 (C10-C16)	<10		10	ug/g	23-DEC-16	230	250	98	150
	F3 (C16-C34)	<50		50	ug/g	23-DEC-16	1700	2500	300	1300
	F4 (C34-C50)	<50		50	ug/g	23-DEC-16	3300	6600	2800	5600
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	28-DEC-16				
	Chrom. to baseline at nC50	YES			No Unit	23-DEC-16				
	Surrogate: 2-Bromobenzotrifluoride	89.6		60-140	%	23-DEC-16				
	Surrogate: 3,4-Dichlorotoluene	113.0		60-140	%	23-DEC-16				
L1873087-6	BH16-5 SA105									
Sampled By:	KM on 20-DEC-16 @ 09:00									
Matrix:	SOIL						#1	#2	#3	#4
Physical Tests										
	% Moisture	10.7		0.10	%	22-DEC-16				
Volatile Organic Compounds										
	Benzene	<0.0068		0.0068	ug/g	23-DEC-16	0.32	0.4	0.21	0.17
	Ethylbenzene	<0.018		0.018	ug/g	23-DEC-16	1.1	1.6	1.1	1.6
	Toluene	<0.080		0.080	ug/g	23-DEC-16	6.4	9	2.3	6
	o-Xylene	<0.020		0.020	ug/g	23-DEC-16				
	m+p-Xylenes	<0.030		0.030	ug/g	23-DEC-16				
	Xylenes (Total)	<0.050		0.050	ug/g	23-DEC-16	26	30	3.1	25
	Surrogate: 4-Bromofluorobenzene	97.4		50-140	%	23-DEC-16				
	Surrogate: 1,4-Difluorobenzene	95.6		50-140	%	23-DEC-16				
Hydrocarbons										
	F1 (C6-C10)	<5.0		5.0	ug/g	23-DEC-16	55	65	55	65
	F1-BTEX	<5.0		5.0	ug/g	28-DEC-16	55	65	55	65
	F2 (C10-C16)	<10		10	ug/g	23-DEC-16	230	250	98	150
	F3 (C16-C34)	<50		50	ug/g	23-DEC-16	1700	2500	300	1300
	F4 (C34-C50)	<50		50	ug/g	23-DEC-16	3300	6600	2800	5600
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	28-DEC-16				
	Chrom. to baseline at nC50	YES			No Unit	23-DEC-16				
	Surrogate: 2-Bromobenzotrifluoride	88.1		60-140	%	23-DEC-16				
	Surrogate: 3,4-Dichlorotoluene	85.3		60-140	%	23-DEC-16				
L1873087-7	BH16-5 SA16									
Sampled By:	KM on 20-DEC-16 @ 09:00									
Matrix:	SOIL						#1	#2	#3	#4
Physical Tests										
	% Moisture	4.24		0.10	%	22-DEC-16				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-7 BH16-5 SA16									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Volatile Organic Compounds									
Benzene	<0.0068		0.0068	ug/g	23-DEC-16	0.32	0.4	0.21	0.17
Ethylbenzene	<0.018		0.018	ug/g	23-DEC-16	1.1	1.6	1.1	1.6
Toluene	<0.080		0.080	ug/g	23-DEC-16	6.4	9	2.3	6
o-Xylene	<0.020		0.020	ug/g	23-DEC-16				
m+p-Xylenes	<0.030		0.030	ug/g	23-DEC-16				
Xylenes (Total)	<0.050		0.050	ug/g	23-DEC-16	26	30	3.1	25
Surrogate: 4-Bromofluorobenzene	101.7		50-140	%	23-DEC-16				
Surrogate: 1,4-Difluorobenzene	101.8		50-140	%	23-DEC-16				
Hydrocarbons									
F1 (C6-C10)	<5.0		5.0	ug/g	23-DEC-16	55	65	55	65
F1-BTEX	<5.0		5.0	ug/g	28-DEC-16	55	65	55	65
F2 (C10-C16)	<10		10	ug/g	23-DEC-16	230	250	98	150
F3 (C16-C34)	<50		50	ug/g	23-DEC-16	1700	2500	300	1300
F4 (C34-C50)	<50		50	ug/g	23-DEC-16	3300	6600	2800	5600
Total Hydrocarbons (C6-C50)	<72		72	ug/g	28-DEC-16				
Chrom. to baseline at nC50	YES			No Unit	23-DEC-16				
Surrogate: 2-Bromobenzotrifluoride	87.0		60-140	%	23-DEC-16				
Surrogate: 3,4-Dichlorotoluene	93.7		60-140	%	23-DEC-16				
L1873087-8 BH16-5 SA18									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Physical Tests									
% Moisture	7.31		0.10	%	22-DEC-16				
Volatile Organic Compounds									
Acetone	<0.50		0.50	ug/g	28-DEC-16	16	28	16	28
Benzene	<0.0068		0.0068	ug/g	28-DEC-16	0.32	0.4	0.21	0.17
Bromodichloromethane	<0.050		0.050	ug/g	28-DEC-16	1.5	1.9	1.5	1.9
Bromoform	<0.050		0.050	ug/g	28-DEC-16	0.61	1.7	0.27	0.26
Bromomethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	28-DEC-16	0.21	0.71	0.05	0.12
Chlorobenzene	<0.050		0.050	ug/g	28-DEC-16	2.4	2.7	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	28-DEC-16	2.3	2.9	2.3	2.9
Chloroform	<0.050		0.050	ug/g	28-DEC-16	0.47	0.18	0.05	0.17
1,2-Dibromoethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	1.2	1.7	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	9.6	12	4.8	6
1,4-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	0.2	0.57	0.083	0.097
Dichlorodifluoromethane	<0.050		0.050	ug/g	28-DEC-16	16	25	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.47	0.6	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
1,1-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	0.064	0.48	0.05	0.05
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.3	2.5	0.084	0.75
Methylene Chloride	<0.050		0.050	ug/g	28-DEC-16	1.6	2	0.1	0.96
1,2-Dichloropropane	<0.050		0.050	ug/g	28-DEC-16	0.16	0.68	0.05	0.085

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-8 BH16-5 SA18									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Volatile Organic Compounds									
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	29-DEC-16	0.059	0.081	0.05	0.081
Ethylbenzene	<0.018		0.018	ug/g	28-DEC-16	1.1	1.6	1.1	1.6
n-Hexane	<0.050		0.050	ug/g	28-DEC-16	46	88	2.8	34
Methyl Ethyl Ketone	<0.50		0.50	ug/g	28-DEC-16	70	88	16	44
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	28-DEC-16	31	210	1.7	4.3
MTBE	<0.050		0.050	ug/g	28-DEC-16	1.6	2.3	0.75	1.4
Styrene	<0.050		0.050	ug/g	28-DEC-16	34	43	0.7	2.2
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.087	0.11	0.058	0.05
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.094	0.05	0.05
Tetrachloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	0.28	2.3
Toluene	<0.080		0.080	ug/g	28-DEC-16	6.4	9	2.3	6
1,1,1-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	6.1	12	0.38	3.4
1,1,2-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.11	0.05	0.05
Trichloroethylene	<0.010		0.010	ug/g	28-DEC-16	0.55	0.61	0.061	0.52
Trichlorofluoromethane	<0.050		0.050	ug/g	28-DEC-16	4	5.8	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	28-DEC-16	0.032	0.25	0.02	0.022
o-Xylene	<0.020		0.020	ug/g	28-DEC-16				
m+p-Xylenes	<0.030		0.030	ug/g	28-DEC-16				
Xylenes (Total)	<0.050		0.050	ug/g	29-DEC-16	26	30	3.1	25
Surrogate: 4-Bromofluorobenzene	106.4		50-140	%	28-DEC-16				
Surrogate: 1,4-Difluorobenzene	108.2		50-140	%	28-DEC-16				
L1873087-9 BH16-5 SA118									
Sampled By: KM on 20-DEC-16 @ 09:00									
Matrix: SOIL									
Physical Tests									
% Moisture	7.43		0.10	%	22-DEC-16				
Volatile Organic Compounds									
Acetone	<0.50		0.50	ug/g	28-DEC-16	16	28	16	28
Benzene	<0.0068		0.0068	ug/g	28-DEC-16	0.32	0.4	0.21	0.17
Bromodichloromethane	<0.050		0.050	ug/g	28-DEC-16	1.5	1.9	1.5	1.9
Bromoform	<0.050		0.050	ug/g	28-DEC-16	0.61	1.7	0.27	0.26
Bromomethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
Carbon tetrachloride	<0.050		0.050	ug/g	28-DEC-16	0.21	0.71	0.05	0.12
Chlorobenzene	<0.050		0.050	ug/g	28-DEC-16	2.4	2.7	2.4	2.7
Dibromochloromethane	<0.050		0.050	ug/g	28-DEC-16	2.3	2.9	2.3	2.9
Chloroform	<0.050		0.050	ug/g	28-DEC-16	0.47	0.18	0.05	0.17
1,2-Dibromoethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05
1,2-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	1.2	1.7	1.2	1.7
1,3-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	9.6	12	4.8	6
1,4-Dichlorobenzene	<0.050		0.050	ug/g	28-DEC-16	0.2	0.57	0.083	0.097
Dichlorodifluoromethane	<0.050		0.050	ug/g	28-DEC-16	16	25	16	25
1,1-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.47	0.6	0.47	0.6
1,2-Dichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.05	0.05	0.05

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2	#3	#4
L1873087-9 BH16-5 SA118 Sampled By: KM on 20-DEC-16 @ 09:00 Matrix: SOIL									
Volatile Organic Compounds									
1,1-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	0.064	0.48	0.05	0.05
cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	1.9	2.5
trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.3	2.5	0.084	0.75
Methylene Chloride	<0.050		0.050	ug/g	28-DEC-16	1.6	2	0.1	0.96
1,2-Dichloropropane	<0.050		0.050	ug/g	28-DEC-16	0.16	0.68	0.05	0.085
cis-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
trans-1,3-Dichloropropene	<0.030		0.030	ug/g	28-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	29-DEC-16	0.059	0.081	0.05	0.081
Ethylbenzene	<0.018		0.018	ug/g	28-DEC-16	1.1	1.6	1.1	1.6
n-Hexane	0.057		0.050	ug/g	28-DEC-16	46	88	2.8	34
Methyl Ethyl Ketone	<0.50		0.50	ug/g	28-DEC-16	70	88	16	44
Methyl Isobutyl Ketone	<0.50		0.50	ug/g	28-DEC-16	31	210	1.7	4.3
MTBE	<0.050		0.050	ug/g	28-DEC-16	1.6	2.3	0.75	1.4
Styrene	<0.050		0.050	ug/g	28-DEC-16	34	43	0.7	2.2
1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.087	0.11	0.058	0.05
1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.094	0.05	0.05
Tetrachloroethylene	<0.050		0.050	ug/g	28-DEC-16	1.9	2.5	0.28	2.3
Toluene	<0.080		0.080	ug/g	28-DEC-16	6.4	9	2.3	6
1,1,1-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	6.1	12	0.38	3.4
1,1,2-Trichloroethane	<0.050		0.050	ug/g	28-DEC-16	0.05	0.11	0.05	0.05
Trichloroethylene	<0.010		0.010	ug/g	28-DEC-16	0.55	0.61	0.061	0.52
Trichlorofluoromethane	<0.050		0.050	ug/g	28-DEC-16	4	5.8	4	5.8
Vinyl chloride	<0.020		0.020	ug/g	28-DEC-16	0.032	0.25	0.02	0.022
o-Xylene	<0.020		0.020	ug/g	28-DEC-16				
m+p-Xylenes	<0.030		0.030	ug/g	28-DEC-16				
Xylenes (Total)	<0.050		0.050	ug/g	29-DEC-16	26	30	3.1	25
Surrogate: 4-Bromofluorobenzene	113.1		50-140	%	28-DEC-16				
Surrogate: 1,4-Difluorobenzene	112.6		50-140	%	28-DEC-16				

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - ON-511-T2-RPI-ICC-C/F-SOIL

#1: T2-Soil-Ind/Com/Commu Property Use (Coarse)

#2: T2-Soil-Ind/Com/Commu Property Use (Fine)

#3: T2-Soil-Res/Park/Inst. Property Use (Coarse)

#4: T2-Soil-Res/Park/Inst. Property Use (Fine)

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
SURR-ND	Surrogate recovery marginally exceeded ALS DQO. Reported non-detect results for associated samples were deemed to be unaffected.
SAR:M	Reported SAR represents a maximum value. Actual SAR may be lower if both Ca and Mg were detectable.

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

BTX-511-HS-WT	Soil	BTEX-O.Reg 153/04 (July 2011)	SW846 8260

BTX is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-WAD-R511-WT	Soil	Cyanide (WAD)-O.Reg 153/04 (July 2011)	MOE 3015/APHA 4500CN I-WAD

The sample is extracted with a strong base for 16 hours, and then filtered. The filtrate is then distilled where the cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-WT	Soil	Conductivity (EC)	MOEE E3138

A representative subsample is tumbled with de-ionized (DI) water. The ratio of water to soil is 2:1 v/w. After tumbling the sample is then analyzed by a conductivity meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Soil	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Soil	F2-F4-O.Reg 153/04 (July 2011)	MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by extracting a soil sample with a solvent mix. The solvent recovered from the extracted soil sample is dried and treated to remove polar material. The extract is analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-200.2-CVAA-WT	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-200.2-CCMS-WT	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)

Dried, ground and sieved soil samples are digested with nitric and hydrochloric acids, followed by analysis by CRC ICPMS.

Method Limitation: This method is not a total digestion technique. It is a very strong acid digestion that is intended to dissolve those metals that may be environmentally available. This method does not dissolve all silicate materials and may result in a partial extraction. depending on the sample matrix, for some metals, including, but not limited to Al, Ba, Be, Cr, Sr, Ti, Tl, and V.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

MOISTURE-WT	Soil	% Moisture	Gravimetric: Oven Dried
PH-WT	Soil	pH	MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

Reference Information

SAR-R511-WT	Soil	SAR-O.Reg 153/04 (July 2011)	SW846 6010C

A dried, disaggregated solid sample is extracted with deionized water, the aqueous extract is separated from the solid, acidified and then analyzed using a ICP/OES. The concentrations of Na, Ca and Mg are reported as per CALA requirements for calculated parameters. These individual parameters are not for comparison to any guideline.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT	Soil	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Soil	VOC-O.Reg 153/04 (July 2011)	SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Soil	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

Quality Control Report

Workorder: L1873087 Report Date: 29-DEC-16

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
B-HWS-R511-WT	**Soil**							
Batch R3624834								
WG2457936-4 DUP		**L1873430-1**						
Boron (B), Hot Water Ext.		0.24	0.23		ug/g	6.8	30	29-DEC-16
WG2457936-2 IRM		**HOTB-SAL_SOIL5**						
Boron (B), Hot Water Ext.			91.9		%		70-130	29-DEC-16
WG2457936-3 LCS								
Boron (B), Hot Water Ext.			102.3		%		70-130	29-DEC-16
WG2457936-1 MB								
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	29-DEC-16
BTX-511-HS-WT	**Soil**							
Batch R3622599								
WG2456040-4 DUP		**WG2456040-3**						
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	23-DEC-16
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	23-DEC-16
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	23-DEC-16
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	23-DEC-16
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	23-DEC-16
WG2456040-2 LCS								
Benzene			104.9		%		70-130	23-DEC-16
Ethylbenzene			103.1		%		70-130	23-DEC-16
m+p-Xylenes			101.5		%		70-130	23-DEC-16
o-Xylene			101.6		%		70-130	23-DEC-16
Toluene			101.0		%		70-130	23-DEC-16
WG2456040-1 MB								
Benzene			<0.0068		ug/g		0.0068	23-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	23-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	23-DEC-16
o-Xylene			<0.020		ug/g		0.02	23-DEC-16
Toluene			<0.080		ug/g		0.08	23-DEC-16
Surrogate: 1,4-Difluorobenzene			109.4		%		50-140	23-DEC-16
Surrogate: 4-Bromofluorobenzene			103.1		%		50-140	23-DEC-16
WG2456040-5 MS		**WG2456040-3**						
Benzene			116.9		%		60-140	23-DEC-16
Ethylbenzene			118.7		%		60-140	23-DEC-16
m+p-Xylenes			112.0		%		60-140	23-DEC-16
o-Xylene			116.2		%		60-140	23-DEC-16
Toluene			115.8		%		60-140	23-DEC-16

Quality Control Report

Workorder: L1873087 Report Date: 29-DEC-16

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CN-WAD-R511-WT	**Soil**							
Batch R3624991								
WG2456224-3 DUP		**L1873087-1**						
Cyanide, Weak Acid Diss		<0.050	<0.050	RPD-NA	ug/g	N/A	35	28-DEC-16
WG2456224-2 LCS								
Cyanide, Weak Acid Diss			97.4		%		80-120	28-DEC-16
WG2456224-1 MB								
Cyanide, Weak Acid Diss			<0.050		ug/g		0.05	28-DEC-16
WG2456224-4 MS		**L1873087-1**						
Cyanide, Weak Acid Diss			104.3		%		70-130	28-DEC-16
CR-CR6-IC-WT	**Soil**							
Batch R3623026								
WG2455997-3 CRM		**WT-SQC012**						
Chromium, Hexavalent			100.5		%		70-130	23-DEC-16
WG2455997-4 DUP		**L1872868-7**						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	23-DEC-16
WG2455997-2 LCS								
Chromium, Hexavalent			96.1		%		80-120	23-DEC-16
WG2455997-1 MB								
Chromium, Hexavalent			<0.20		ug/g		0.2	23-DEC-16
EC-WT	**Soil**							
Batch R3624481								
WG2457425-4 DUP		**WG2457425-3**						
Conductivity		1.04	1.08		mS/cm	3.9	20	28-DEC-16
WG2457518-3 LCS								
Conductivity			100.8		%		90-110	28-DEC-16
WG2457425-1 MB								
Conductivity			<0.0040		mS/cm		0.004	28-DEC-16
F1-HS-511-WT	**Soil**							
Batch R3622599								
WG2456040-4 DUP		**WG2456040-3**						
F1 (C6-C10)		15.7	18.2		ug/g	15	30	29-DEC-16
WG2456040-2 LCS								
F1 (C6-C10)			102.9		%		80-120	23-DEC-16
WG2456040-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	23-DEC-16
Surrogate: 3,4-Dichlorotoluene			112.1		%		60-140	23-DEC-16
WG2456040-7 MS		**WG2456040-6**						
F1 (C6-C10)			92.2		%		60-140	23-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Soil**							
Batch R3624773								
WG2456752-4 DUP		**WG2456752-3**						
F1 (C6-C10)		1130	856		ug/g	28	30	28-DEC-16
WG2456752-2 LCS								
F1 (C6-C10)			86.3		%		80-120	28-DEC-16
WG2456752-1 MB								
F1 (C6-C10)			<5.0		ug/g		5	28-DEC-16
Surrogate: 3,4-Dichlorotoluene			97.3		%		60-140	28-DEC-16
WG2456752-7 MS		**WG2456752-6**						
F1 (C6-C10)			N/A	MS-B	%		-	28-DEC-16
F2-F4-511-WT	**Soil**							
Batch R3624157								
WG2455995-3 CRM		**ALS PHC2 IRM**						
F2 (C10-C16)			95.0		%		70-130	23-DEC-16
F3 (C16-C34)			94.5		%		70-130	23-DEC-16
F4 (C34-C50)			93.8		%		70-130	23-DEC-16
WG2455995-5 DUP		**WG2455995-4**						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	23-DEC-16
F3 (C16-C34)		<50	61	RPD-NA	ug/g	N/A	30	23-DEC-16
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	23-DEC-16
WG2455995-2 LCS								
F2 (C10-C16)			100.7		%		80-120	23-DEC-16
F3 (C16-C34)			98.8		%		80-120	23-DEC-16
F4 (C34-C50)			95.0		%		80-120	23-DEC-16
WG2455995-1 MB								
F2 (C10-C16)			<10		ug/g		10	23-DEC-16
F3 (C16-C34)			<50		ug/g		50	23-DEC-16
F4 (C34-C50)			<50		ug/g		50	23-DEC-16
Surrogate: 2-Bromobenzotrifluoride			87.1		%		60-140	23-DEC-16
HG-200.2-CVAA-WT	**Soil**							
Batch R3624984								
WG2457939-2 CRM		**WT-CANMET-TILL1**						
Mercury (Hg)			96.7		%		70-130	29-DEC-16
WG2457939-6 DUP		**WG2457939-5**						
Mercury (Hg)		0.0746	0.0828		ug/g	10	40	29-DEC-16
WG2457939-3 LCS								
Mercury (Hg)			102.0		%		80-120	29-DEC-16
WG2457939-1 MB								

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-200.2-CVAA-WT	**Soil**							
Batch R3624984								
WG2457939-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	29-DEC-16
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-2 CRM		**WT-CANMET-TILL1**						
Antimony (Sb)			112.6		%		70-130	29-DEC-16
Arsenic (As)			125.0		%		70-130	29-DEC-16
Barium (Ba)			126.8		%		70-130	29-DEC-16
Beryllium (Be)			98.9		%		70-130	29-DEC-16
Cadmium (Cd)			113.2		%		70-130	29-DEC-16
Chromium (Cr)			125.5		%		70-130	29-DEC-16
Cobalt (Co)			119.2		%		70-130	29-DEC-16
Copper (Cu)			114.9		%		70-130	29-DEC-16
Lead (Pb)			103.2		%		70-130	29-DEC-16
Molybdenum (Mo)			101.6		%		70-130	29-DEC-16
Nickel (Ni)			120.0		%		70-130	29-DEC-16
Selenium (Se)			102.4		%		70-130	29-DEC-16
Silver (Ag)			112.1		%		70-130	29-DEC-16
Thallium (Tl)			113.5		%		70-130	29-DEC-16
Uranium (U)			125.8		%		70-130	29-DEC-16
Vanadium (V)			127.7		%		70-130	29-DEC-16
Zinc (Zn)			116.4		%		70-130	29-DEC-16
WG2457939-6 DUP		**WG2457939-5**						
Antimony (Sb)		0.28	0.27		ug/g	2.1	30	29-DEC-16
Arsenic (As)		2.30	2.13		ug/g	7.3	30	29-DEC-16
Barium (Ba)		60.7	58.8		ug/g	3.3	40	29-DEC-16
Beryllium (Be)		0.23	0.23		ug/g	1.6	30	29-DEC-16
Boron (B)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	29-DEC-16
Cadmium (Cd)		0.143	0.125		ug/g	13	30	29-DEC-16
Chromium (Cr)		14.1	13.9		ug/g	1.5	30	29-DEC-16
Cobalt (Co)		4.50	4.15		ug/g	8.3	30	29-DEC-16
Copper (Cu)		15.7	14.6		ug/g	7.0	30	29-DEC-16
Lead (Pb)		49.8	53.4		ug/g	6.9	40	29-DEC-16
Molybdenum (Mo)		0.26	0.30		ug/g	14	40	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-6 DUP		**WG2457939-5**						
Nickel (Ni)		8.15	7.84		ug/g	3.9	30	29-DEC-16
Selenium (Se)		0.22	0.22		ug/g	2.1	30	29-DEC-16
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	29-DEC-16
Thallium (Tl)		0.074	0.070		ug/g	4.6	30	29-DEC-16
Uranium (U)		0.514	0.497		ug/g	3.4	30	29-DEC-16
Vanadium (V)		25.8	24.2		ug/g	6.6	30	29-DEC-16
Zinc (Zn)		41.0	41.4		ug/g	1.0	30	29-DEC-16
WG2457939-4 LCS								
Antimony (Sb)			106.7		%		80-120	29-DEC-16
Arsenic (As)			99.3		%		80-120	29-DEC-16
Barium (Ba)			100.3		%		80-120	29-DEC-16
Beryllium (Be)			94.6		%		80-120	29-DEC-16
Boron (B)			94.7		%		80-120	29-DEC-16
Cadmium (Cd)			96.1		%		80-120	29-DEC-16
Chromium (Cr)			99.5		%		80-120	29-DEC-16
Cobalt (Co)			98.6		%		80-120	29-DEC-16
Copper (Cu)			96.7		%		80-120	29-DEC-16
Lead (Pb)			103.2		%		80-120	29-DEC-16
Molybdenum (Mo)			95.6		%		80-120	29-DEC-16
Nickel (Ni)			98.0		%		80-120	29-DEC-16
Selenium (Se)			96.4		%		80-120	29-DEC-16
Silver (Ag)			100.6		%		80-120	29-DEC-16
Thallium (Tl)			100.1		%		80-120	29-DEC-16
Uranium (U)			102.1		%		80-120	29-DEC-16
Vanadium (V)			101.4		%		80-120	29-DEC-16
Zinc (Zn)			91.5		%		80-120	29-DEC-16
WG2457939-1 MB								
Antimony (Sb)			<0.10		mg/kg		0.1	29-DEC-16
Arsenic (As)			<0.10		mg/kg		0.1	29-DEC-16
Barium (Ba)			<0.50		mg/kg		0.5	29-DEC-16
Beryllium (Be)			<0.10		mg/kg		0.1	29-DEC-16
Boron (B)			<5.0		mg/kg		5	29-DEC-16
Cadmium (Cd)			<0.020		mg/kg		0.02	29-DEC-16
Chromium (Cr)			<0.50		mg/kg		0.5	29-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-WT	**Soil**							
Batch R3624890								
WG2457939-1 MB								
Cobalt (Co)			<0.10		mg/kg		0.1	29-DEC-16
Copper (Cu)			<0.50		mg/kg		0.5	29-DEC-16
Lead (Pb)			<0.50		mg/kg		0.5	29-DEC-16
Molybdenum (Mo)			<0.10		mg/kg		0.1	29-DEC-16
Nickel (Ni)			<0.50		mg/kg		0.5	29-DEC-16
Selenium (Se)			<0.20		mg/kg		0.2	29-DEC-16
Silver (Ag)			<0.10		mg/kg		0.1	29-DEC-16
Thallium (Tl)			<0.050		mg/kg		0.05	29-DEC-16
Uranium (U)			<0.050		mg/kg		0.05	29-DEC-16
Vanadium (V)			<0.20		mg/kg		0.2	29-DEC-16
Zinc (Zn)			<2.0		mg/kg		2	29-DEC-16
MOISTURE-WT	**Soil**							
Batch R3622592								
WG2456056-3 DUP		**L1872264-1**						
% Moisture		9.92	9.56		%	3.6	20	22-DEC-16
WG2456056-2 LCS								
% Moisture			99.9		%		90-110	22-DEC-16
WG2456056-1 MB								
% Moisture			<0.10		%		0.1	22-DEC-16
PH-WT	**Soil**							
Batch R3622880								
WG2456202-1 DUP		**L1873087-1**						
pH		7.15	7.21	J	pH units	0.06	0.3	23-DEC-16
WG2456795-1 LCS								
pH			6.97		pH units		6.7-7.3	23-DEC-16
SAR-R511-WT	**Soil**							
Batch R3624370								
WG2457425-4 DUP		**WG2457425-3**						
Calcium (Ca)		8.4	7.3		mg/L	14	30	28-DEC-16
Sodium (Na)		211	197		mg/L	6.8	30	28-DEC-16
Magnesium (Mg)		<1.0	<1.0	RPD-NA	mg/L	N/A	30	28-DEC-16
WG2457425-2 IRM		**WT SAR1**						
Calcium (Ca)			106.3		%		70-130	28-DEC-16
Sodium (Na)			95.4		%		70-130	28-DEC-16
Magnesium (Mg)			103.9		%		70-130	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SAR-R511-WT	**Soil**							
Batch R3624370								
WG2457425-1 MB								
Calcium (Ca)			<1.0		mg/L		1	28-DEC-16
Sodium (Na)			<1.0		mg/L		1	28-DEC-16
Magnesium (Mg)			<1.0		mg/L		1	28-DEC-16
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-4 DUP		**WG2456752-3**						
1,1,1,2-Tetrachloroethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,1,2,2-Tetrachloroethane		<4.5	<3.5	RPD-NA	ug/g	N/A	40	28-DEC-16
1,1,1-Trichloroethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,1,2-Trichloroethane		<2.5	<2.1	RPD-NA	ug/g	N/A	40	28-DEC-16
1,1-Dichloroethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,1-Dichloroethylene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,2-Dibromoethane		<0.45	<0.45	RPD-NA	ug/g	N/A	40	28-DEC-16
1,2-Dichlorobenzene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,2-Dichloroethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,2-Dichloropropane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,3-Dichlorobenzene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
1,4-Dichlorobenzene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Acetone		<4.0	<4.0	RPD-NA	ug/g	N/A	40	28-DEC-16
Benzene		<0.054	<0.054	RPD-NA	ug/g	N/A	40	28-DEC-16
Bromodichloromethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Bromoform		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Bromomethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Carbon tetrachloride		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Chlorobenzene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Chloroform		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
cis-1,2-Dichloroethylene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
cis-1,3-Dichloropropene		<0.24	<0.24	RPD-NA	ug/g	N/A	40	28-DEC-16
Dibromochloromethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Dichlorodifluoromethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Ethylbenzene		<0.14	<0.14	RPD-NA	ug/g	N/A	40	28-DEC-16
n-Hexane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Methylene Chloride		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-4 DUP		**WG2456752-3**						
MTBE		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
m+p-Xylenes		<0.24	<0.24	RPD-NA	ug/g	N/A	40	28-DEC-16
Methyl Ethyl Ketone		<4.0	<4.0	RPD-NA	ug/g	N/A	40	28-DEC-16
Methyl Isobutyl Ketone		<4.0	<4.0	RPD-NA	ug/g	N/A	40	28-DEC-16
o-Xylene		<0.16	<0.16	RPD-NA	ug/g	N/A	40	28-DEC-16
Styrene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Tetrachloroethylene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Toluene		<0.64	<0.64	RPD-NA	ug/g	N/A	40	28-DEC-16
trans-1,2-Dichloroethylene		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
trans-1,3-Dichloropropene		<0.24	<0.24	RPD-NA	ug/g	N/A	40	28-DEC-16
Trichloroethylene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	28-DEC-16
Trichlorofluoromethane		<0.40	<0.40	RPD-NA	ug/g	N/A	40	28-DEC-16
Vinyl chloride		<0.16	<0.16	RPD-NA	ug/g	N/A	40	28-DEC-16
WG2456752-2 LCS								
1,1,1,2-Tetrachloroethane			93.7		%		60-130	28-DEC-16
1,1,2,2-Tetrachloroethane			101.6		%		60-130	28-DEC-16
1,1,1-Trichloroethane			93.4		%		60-130	28-DEC-16
1,1,2-Trichloroethane			97.5		%		60-130	28-DEC-16
1,1-Dichloroethane			101.3		%		60-130	28-DEC-16
1,1-Dichloroethylene			89.8		%		60-130	28-DEC-16
1,2-Dibromoethane			99.4		%		70-130	28-DEC-16
1,2-Dichlorobenzene			96.8		%		70-130	28-DEC-16
1,2-Dichloroethane			98.7		%		60-130	28-DEC-16
1,2-Dichloropropane			97.7		%		70-130	28-DEC-16
1,3-Dichlorobenzene			94.8		%		70-130	28-DEC-16
1,4-Dichlorobenzene			96.7		%		70-130	28-DEC-16
Acetone			113.1		%		60-140	28-DEC-16
Benzene			96.4		%		70-130	28-DEC-16
Bromodichloromethane			95.5		%		50-140	28-DEC-16
Bromoform			100.6		%		70-130	28-DEC-16
Bromomethane			99.0		%		50-140	28-DEC-16
Carbon tetrachloride			91.2		%		70-130	28-DEC-16
Chlorobenzene			97.3		%		70-130	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-2 LCS								
Chloroform			89.7		%		70-130	28-DEC-16
cis-1,2-Dichloroethylene			93.6		%		70-130	28-DEC-16
cis-1,3-Dichloropropene			108.8		%		70-130	28-DEC-16
Dibromochloromethane			104.4		%		60-130	28-DEC-16
Dichlorodifluoromethane			65.5		%		50-140	28-DEC-16
Ethylbenzene			95.8		%		70-130	28-DEC-16
n-Hexane			99.0		%		70-130	28-DEC-16
Methylene Chloride			97.5		%		70-130	28-DEC-16
MTBE			92.8		%		70-130	28-DEC-16
m+p-Xylenes			97.9		%		70-130	28-DEC-16
Methyl Ethyl Ketone			107.9		%		60-140	28-DEC-16
Methyl Isobutyl Ketone			108.4		%		60-140	28-DEC-16
o-Xylene			96.8		%		70-130	28-DEC-16
Styrene			98.0		%		70-130	28-DEC-16
Tetrachloroethylene			90.3		%		60-130	28-DEC-16
Toluene			95.7		%		70-130	28-DEC-16
trans-1,2-Dichloroethylene			93.5		%		60-130	28-DEC-16
trans-1,3-Dichloropropene			102.4		%		70-130	28-DEC-16
Trichloroethylene			92.0		%		60-130	28-DEC-16
Trichlorofluoromethane			94.3		%		50-140	28-DEC-16
Vinyl chloride			88.4		%		60-140	28-DEC-16
WG2456752-1 MB								
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,1-Trichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1,2-Trichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1-Dichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,1-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
1,2-Dibromoethane			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichloroethane			<0.050		ug/g		0.05	28-DEC-16
1,2-Dichloropropane			<0.050		ug/g		0.05	28-DEC-16
1,3-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16
1,4-Dichlorobenzene			<0.050		ug/g		0.05	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-1 MB								
Acetone			<0.50		ug/g		0.5	28-DEC-16
Benzene			<0.0068		ug/g		0.0068	28-DEC-16
Bromodichloromethane			<0.050		ug/g		0.05	28-DEC-16
Bromoform			<0.050		ug/g		0.05	28-DEC-16
Bromomethane			<0.050		ug/g		0.05	28-DEC-16
Carbon tetrachloride			<0.050		ug/g		0.05	28-DEC-16
Chlorobenzene			<0.050		ug/g		0.05	28-DEC-16
Chloroform			<0.050		ug/g		0.05	28-DEC-16
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	28-DEC-16
Dibromochloromethane			<0.050		ug/g		0.05	28-DEC-16
Dichlorodifluoromethane			<0.050		ug/g		0.05	28-DEC-16
Ethylbenzene			<0.018		ug/g		0.018	28-DEC-16
n-Hexane			<0.050		ug/g		0.05	28-DEC-16
Methylene Chloride			<0.050		ug/g		0.05	28-DEC-16
MTBE			<0.050		ug/g		0.05	28-DEC-16
m+p-Xylenes			<0.030		ug/g		0.03	28-DEC-16
Methyl Ethyl Ketone			<0.50		ug/g		0.5	28-DEC-16
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	28-DEC-16
o-Xylene			<0.020		ug/g		0.02	28-DEC-16
Styrene			<0.050		ug/g		0.05	28-DEC-16
Tetrachloroethylene			<0.050		ug/g		0.05	28-DEC-16
Toluene			<0.080		ug/g		0.08	28-DEC-16
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	28-DEC-16
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	28-DEC-16
Trichloroethylene			<0.010		ug/g		0.01	28-DEC-16
Trichlorofluoromethane			<0.050		ug/g		0.05	28-DEC-16
Vinyl chloride			<0.020		ug/g		0.02	28-DEC-16
Surrogate: 1,4-Difluorobenzene			110.6		%		50-140	28-DEC-16
Surrogate: 4-Bromofluorobenzene			106.9		%		50-140	28-DEC-16
WG2456752-5 MS		**WG2456752-3**						
1,1,1,2-Tetrachloroethane			95.3		%		50-140	28-DEC-16
1,1,2,2-Tetrachloroethane			164.5	E	%		50-140	28-DEC-16
1,1,1-Trichloroethane			94.0		%		50-140	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-5 MS		**WG2456752-3**						
1,1,2-Trichloroethane			185.3	E	%		50-140	28-DEC-16
1,1-Dichloroethane			101.2		%		50-140	28-DEC-16
1,1-Dichloroethylene			89.9		%		50-140	28-DEC-16
1,2-Dibromoethane			152.7	E	%		50-140	28-DEC-16
1,2-Dichlorobenzene			91.8		%		50-140	28-DEC-16
1,2-Dichloroethane			98.4		%		50-140	28-DEC-16
1,2-Dichloropropane			97.5		%		50-140	28-DEC-16
1,3-Dichlorobenzene			91.0		%		50-140	28-DEC-16
1,4-Dichlorobenzene			93.8		%		50-140	28-DEC-16
Acetone			128.6		%		50-140	28-DEC-16
Benzene			95.6		%		50-140	28-DEC-16
Bromodichloromethane			97.0		%		50-140	28-DEC-16
Bromoform			96.9		%		50-140	28-DEC-16
Bromomethane			96.1		%		50-140	28-DEC-16
Carbon tetrachloride			92.2		%		50-140	28-DEC-16
Chlorobenzene			106.0		%		50-140	28-DEC-16
Chloroform			94.3		%		50-140	28-DEC-16
cis-1,2-Dichloroethylene			94.6		%		50-140	28-DEC-16
cis-1,3-Dichloropropene			100.8		%		50-140	28-DEC-16
Dibromochloromethane			105.1		%		50-140	28-DEC-16
Dichlorodifluoromethane			71.1		%		50-140	28-DEC-16
Ethylbenzene			97.6		%		50-140	28-DEC-16
n-Hexane			98.8		%		50-140	28-DEC-16
Methylene Chloride			99.9		%		50-140	28-DEC-16
MTBE			92.8		%		50-140	28-DEC-16
m+p-Xylenes			97.3		%		50-140	28-DEC-16
Methyl Ethyl Ketone			112.6		%		50-140	28-DEC-16
Methyl Isobutyl Ketone			104.3		%		50-140	28-DEC-16
o-Xylene			95.8		%		50-140	28-DEC-16
Styrene			96.9		%		50-140	28-DEC-16
Tetrachloroethylene			89.0		%		50-140	28-DEC-16
Toluene			94.5		%		50-140	28-DEC-16
trans-1,2-Dichloroethylene			92.1		%		50-140	28-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Soil**							
Batch R3624773								
WG2456752-5 MS		**WG2456752-3**						
trans-1,3-Dichloropropene			94.6		%		50-140	28-DEC-16
Trichloroethylene			92.1		%		50-140	28-DEC-16
Trichlorofluoromethane			97.6		%		50-140	28-DEC-16
Vinyl chloride			89.1		%		50-140	28-DEC-16

Quality Control Report

Workorder: L1873087 Report Date: 29-DEC-16

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLQ	Detection Limit raised due to co-eluting interference. GCMS qualifier ion ratio did not meet acceptance criteria.
E	Matrix Spike recovery outside ALS DQO due to heterogeneous analyte background in sample.
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

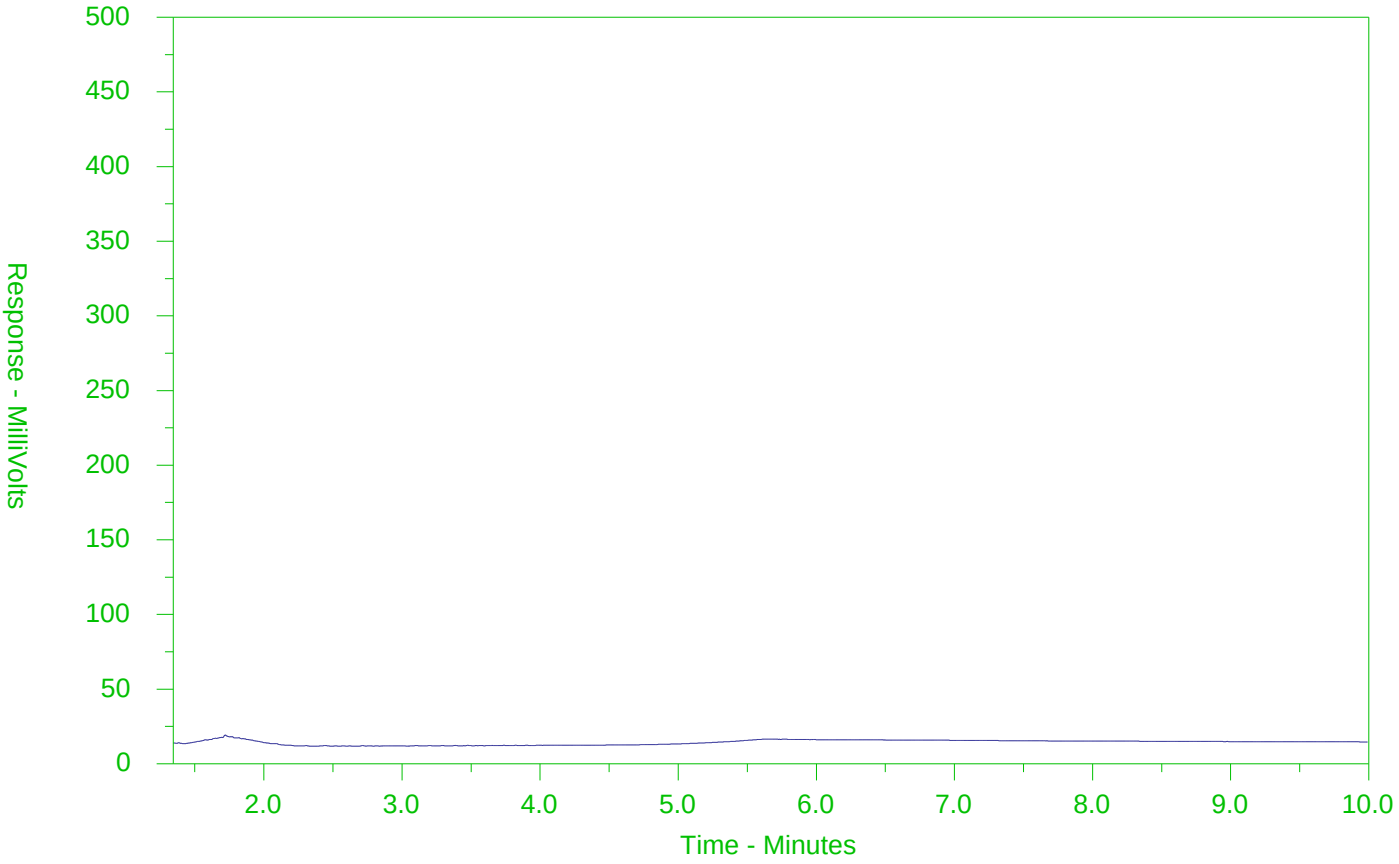
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873087-3
Client Sample ID: BH16-3 SA19



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

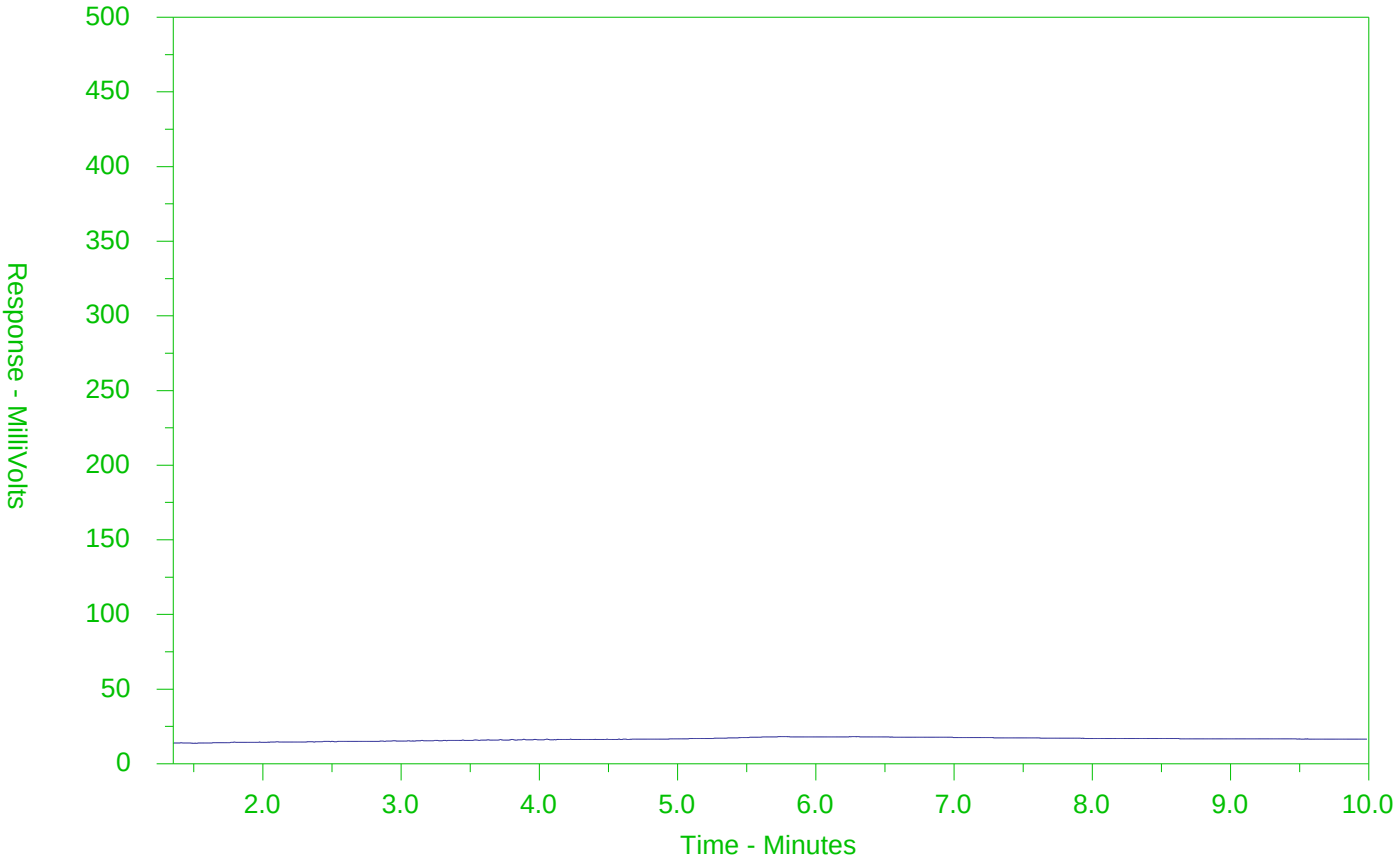
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873087-5
Client Sample ID: BH16-5 SA5



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

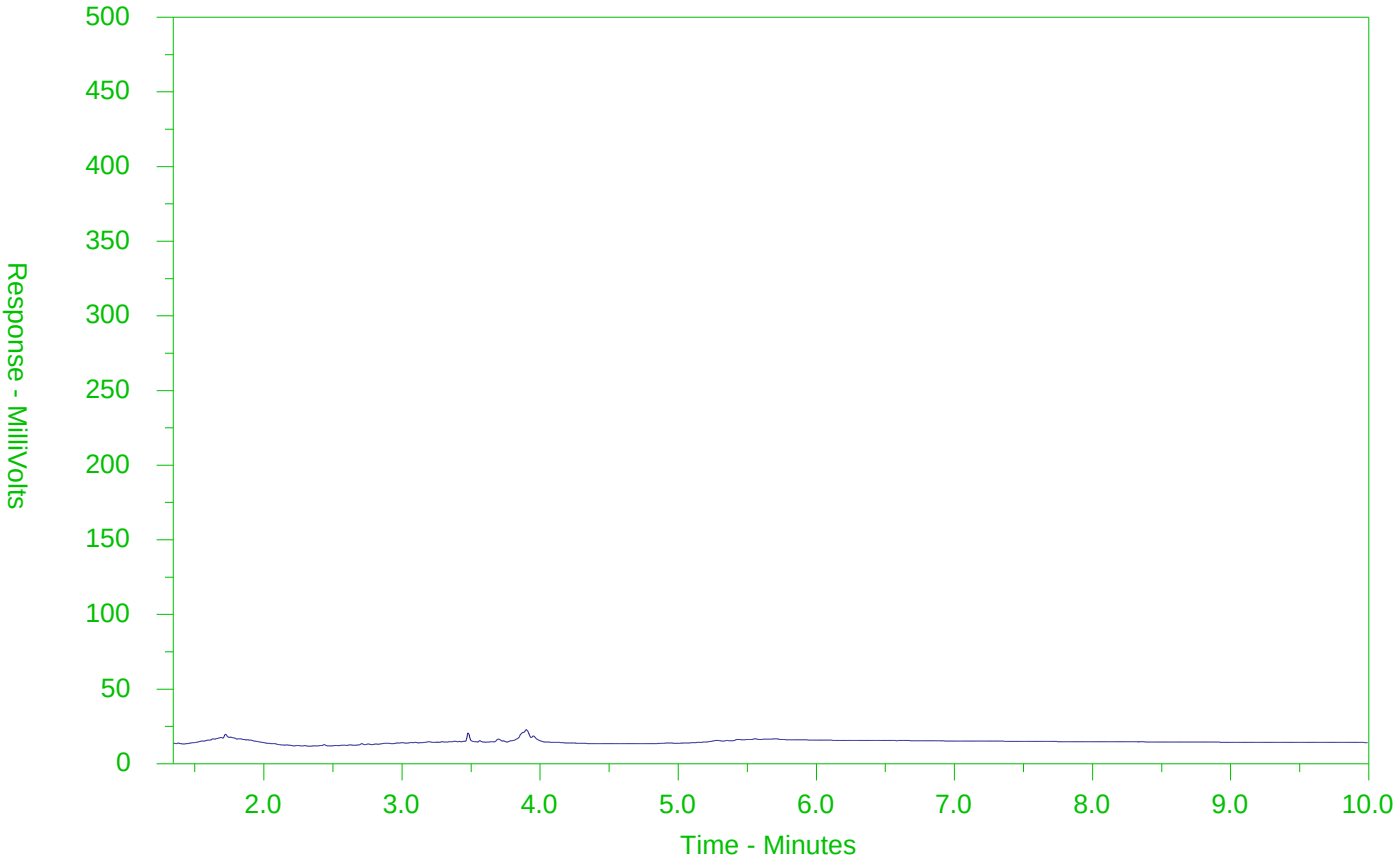
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873087-6
Client Sample ID: BH16-5 SA105



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

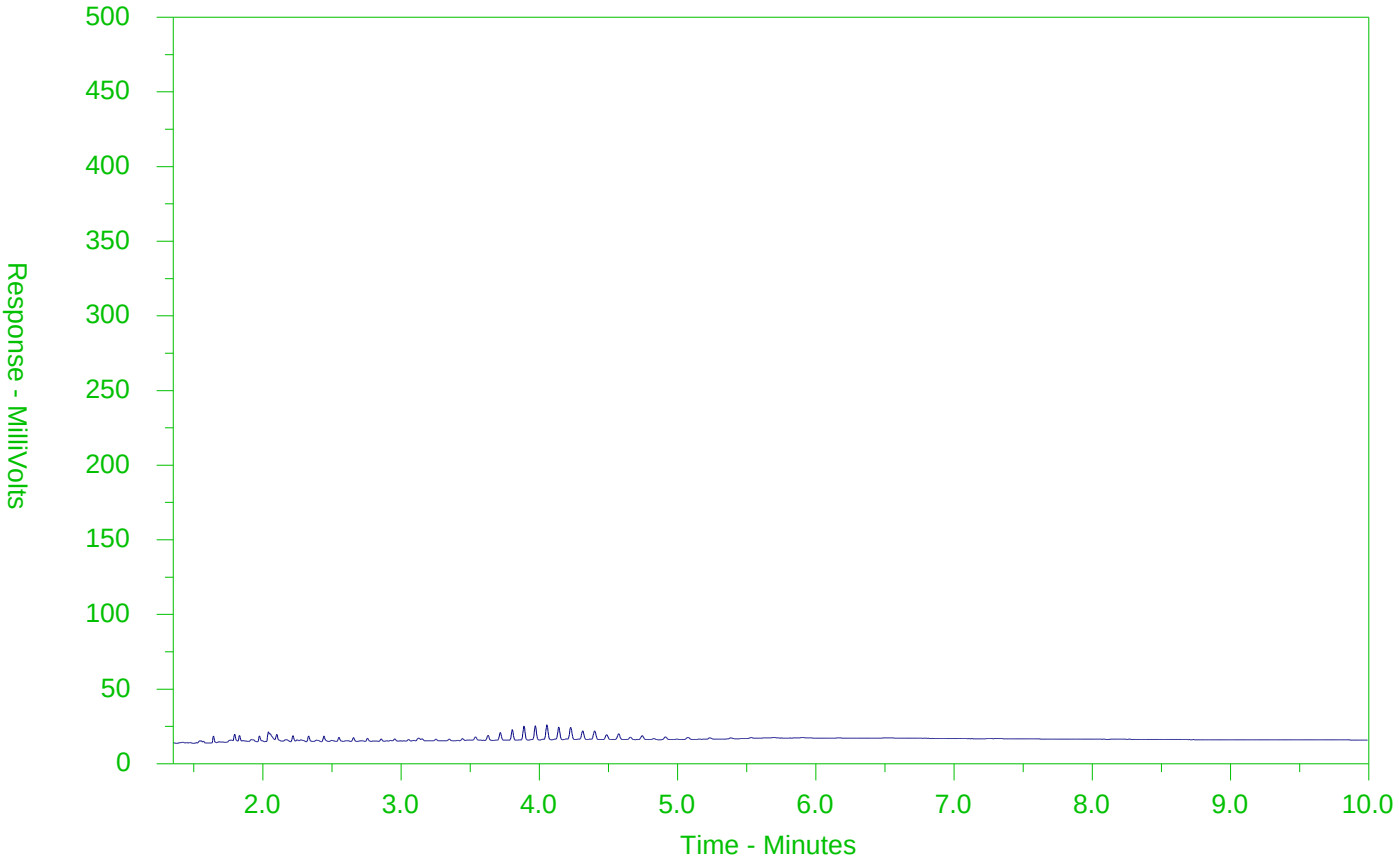
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1873087-7
Client Sample ID: BH16-5 SA16



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1873087-COFC

COC Number: 15 -

Page | of |

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply
Company:	WSP Canada Inc. (Ottawa)	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:	Kathryn Maton	Quality Control (QC) Report with Report ☐ YES ☐ NO	PRIORITY (Business Days): 4 day [P4] ☐ / 3 day [P3] ☐ / 2 day [P2] ☐ — EMERGENCY: 1 Business day [E1] ☐ / Same Day, Weekend or Statutory holiday [E0] ☐
Phone:	(613) 617-9237	☑ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	2611 Queensview Drive, Suite 300	Email 1 or Fax kathryn.Maton@wspgroup.com	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
City/Province:	Ottawa, ON	Email 2	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	K2B 8K2	Email 3	

Invoice To	Same as Report To ☑ YES ☐ NO	Invoice Distribution
	Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Company:		Email 1 or Fax kathryn.Maton@wspgroup.com
Contact:		Email 2 payables.ontario@wspgroup.com

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	25601 / Quote Q59797	AFE/Cost Center:	PO#
Job #:	161-17230-00	Major/Minor Code:	Routing Code:
PO / AFE:	n/a	Requisitioner:	
LSD:	n/a	Location:	

ALS Lab Work Order # (lab use only): L1873087 | ALS Contact: E. Perez | Sampler: KM.

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Metals and Inorganics	VOCs	BTEX, F1-F4	Number of Containers
1	BH16-3 SA2	20/12/2016	1pm	Soil	X			1
2	BH16-3 SA10Z	20/12/2016	1pm	Soil	X			1
3	BH16-3 SA19		↓	↓		X	X	3
4	BH16-5 SA1B		9am		X			1
5	BH16-5 SA5						X	3
6	BH16-5 SA10S						X	3
7	BH16-5 SA16						X	3
8	BH16-5 SA18					X		3
9	BH16-5 SA118					X		3

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)	SAMPLE CONDITION AS RECEIVED (lab use only)
Are samples taken from a Regulated DW System? ☐ YES ☒ NO	Compare against ON Reg. 153/04 Table 2 RPI / ICC (circle one)	Frozen ☐ SIF Observations Yes ☐ No ☐
Are samples for human drinking water use? ☐ YES ☒ NO		Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
		Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.5			8.3		

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: K Maton.	Date: 20/12/2016.	Time: 6pm	Received by:	Date: 22/12/16	Time: 9:00	Received by:	Date: 22/12/16	Time: 9:00

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY — OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WSP Canada Inc. (Ottawa)
ATTN: Kathryn Maton
2611 Queensview Dr
Suite 300
Ottawa ON K2B 8K2

Date Received: 28-DEC-16
Report Date: 30-DEC-16 14:31 (MT)
Version: FINAL

Client Phone: 613-829-2800

Certificate of Analysis

Lab Work Order #: L1874349

Project P.O. #: NOT SUBMITTED
Job Reference: 161-17230-00
C of C Numbers: 14-447345
Legal Site Desc:

Emerson Perez, B.S.E
Account Manager

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1874349-1 MW16-2							
Sampled By: CLIENT on 26-DEC-16 @ 12:00							
Matrix: WATER							
Physical Tests							
Conductivity	0.986		0.0030	mS/cm	29-DEC-16		
pH	7.88		0.10	pH units	30-DEC-16		
Anions and Nutrients							
Chloride (Cl)	152		0.50	mg/L	30-DEC-16	790	790
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L	29-DEC-16	66	66
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD			No Unit	29-DEC-16		
Dissolved Metals Filtration Location	FIELD			No Unit	29-DEC-16		
Antimony (Sb)-Dissolved	0.13		0.10	ug/L	30-DEC-16	6	6
Arsenic (As)-Dissolved	0.11		0.10	ug/L	30-DEC-16	25	25
Barium (Ba)-Dissolved	84.7		0.10	ug/L	30-DEC-16	1000	1000
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	4	4
Boron (B)-Dissolved	29		10	ug/L	30-DEC-16	5000	5000
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2.7	2.7
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	50	50
Cobalt (Co)-Dissolved	0.19		0.10	ug/L	30-DEC-16	3.8	3.8
Copper (Cu)-Dissolved	1.06		0.20	ug/L	30-DEC-16	87	87
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	10	10
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	29-DEC-16	0.29	1
Molybdenum (Mo)-Dissolved	5.58		0.050	ug/L	30-DEC-16	70	70
Nickel (Ni)-Dissolved	0.93		0.50	ug/L	30-DEC-16	100	100
Selenium (Se)-Dissolved	0.594		0.050	ug/L	30-DEC-16	10	10
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	1.5	1.5
Sodium (Na)-Dissolved	93300		500	ug/L	30-DEC-16	490000	490000
Thallium (Tl)-Dissolved	0.011		0.010	ug/L	30-DEC-16	2	2
Uranium (U)-Dissolved	0.798		0.010	ug/L	30-DEC-16	20	20
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	6.2	6.2
Zinc (Zn)-Dissolved	1.5		1.0	ug/L	30-DEC-16	1100	1100
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L	30-DEC-16	25	25
Volatile Organic Compounds							
Acetone	<30		30	ug/L	30-DEC-16	2700	2700
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L1874349-1	MW16-2									
Sampled By:	CLIENT on 26-DEC-16 @ 12:00									
Matrix:	WATER						#1	#2		
Volatile Organic Compounds										
	Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590		
	1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5		
	1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
	1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14		
	cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50		
	1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5		
	cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
	trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
	1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5		
	Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4		
	n-Hexane	0.88		0.50	ug/L	30-DEC-16	51	520		
	Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800		
	Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640		
	MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15		
	Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4		
	1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1		
	1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1		
	Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24		
	1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200		
	1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5		
	Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
	Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150		
	Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7		
	o-Xylene	<0.30		0.30	ug/L	30-DEC-16				
	m+p-Xylenes	0.58		0.40	ug/L	30-DEC-16				
	Xylenes (Total)	0.58		0.50	ug/L	30-DEC-16	300	300		
	Surrogate: 4-Bromofluorobenzene	98.6		70-130	%	30-DEC-16				
	Surrogate: 1,4-Difluorobenzene	99.7		70-130	%	30-DEC-16				
Hydrocarbons										
	F1 (C6-C10)	<25		25	ug/L	30-DEC-16	750	750		
	F1-BTEX	<25		25	ug/L	30-DEC-16	750	750		
	F2 (C10-C16)	<100		100	ug/L	29-DEC-16	150	150		
	F3 (C16-C34)	<250		250	ug/L	29-DEC-16	500	500		
	F4 (C34-C50)	<250		250	ug/L	29-DEC-16	500	500		
	Total Hydrocarbons (C6-C50)	<370		370	ug/L	30-DEC-16				
	Chrom. to baseline at nC50	YES			No Unit	29-DEC-16				
	Surrogate: 2-Bromobenzotrifluoride	95.9		60-140	%	29-DEC-16				
	Surrogate: 3,4-Dichlorotoluene	95.0		60-140	%	30-DEC-16				
L1874349-2	MW16-3									
Sampled By:	CLIENT on 26-DEC-16 @ 11:00									
Matrix:	WATER						#1	#2		
Physical Tests										

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use **#2: T2-Ground Water (Fine Soil)-All Types of Property Use**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1874349-2 MW16-3							
Sampled By: CLIENT on 26-DEC-16 @ 11:00							
Matrix: WATER							
Physical Tests							
Conductivity	0.889		0.0030	mS/cm	29-DEC-16		
pH	7.92		0.10	pH units	30-DEC-16		
Anions and Nutrients							
Chloride (Cl)	117		0.50	mg/L	30-DEC-16	790	790
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L	29-DEC-16	66	66
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD			No Unit	29-DEC-16		
Dissolved Metals Filtration Location	FIELD			No Unit	29-DEC-16		
Antimony (Sb)-Dissolved	0.12		0.10	ug/L	30-DEC-16	6	6
Arsenic (As)-Dissolved	0.13		0.10	ug/L	30-DEC-16	25	25
Barium (Ba)-Dissolved	82.0		0.10	ug/L	30-DEC-16	1000	1000
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	4	4
Boron (B)-Dissolved	28		10	ug/L	30-DEC-16	5000	5000
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2.7	2.7
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	50	50
Cobalt (Co)-Dissolved	0.21		0.10	ug/L	30-DEC-16	3.8	3.8
Copper (Cu)-Dissolved	0.96		0.20	ug/L	30-DEC-16	87	87
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	10	10
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	29-DEC-16	0.29	1
Molybdenum (Mo)-Dissolved	2.07		0.050	ug/L	30-DEC-16	70	70
Nickel (Ni)-Dissolved	0.99		0.50	ug/L	30-DEC-16	100	100
Selenium (Se)-Dissolved	0.139		0.050	ug/L	30-DEC-16	10	10
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	1.5	1.5
Sodium (Na)-Dissolved	85700		500	ug/L	30-DEC-16	490000	490000
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2	2
Uranium (U)-Dissolved	0.787		0.010	ug/L	30-DEC-16	20	20
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	6.2	6.2
Zinc (Zn)-Dissolved	1.5		1.0	ug/L	30-DEC-16	1100	1100
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L	30-DEC-16	25	25
Volatile Organic Compounds							
Acetone	<30		30	ug/L	30-DEC-16	2700	2700
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L1874349-2	MW16-3									
Sampled By:	CLIENT on 26-DEC-16 @ 11:00									
Matrix:	WATER						#1	#2		
Volatile Organic Compounds										
	Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590		
	1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5		
	1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
	1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14		
	cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50		
	1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5		
	cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
	trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
	1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5		
	Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4		
	n-Hexane	<0.50		0.50	ug/L	30-DEC-16	51	520		
	Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800		
	Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640		
	MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15		
	Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4		
	1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1		
	1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1		
	Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
	Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24		
	1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200		
	1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5		
	Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
	Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150		
	Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7		
	o-Xylene	<0.30		0.30	ug/L	30-DEC-16				
	m+p-Xylenes	<0.40		0.40	ug/L	30-DEC-16				
	Xylenes (Total)	<0.50		0.50	ug/L	30-DEC-16	300	300		
	Surrogate: 4-Bromofluorobenzene	98.4		70-130	%	30-DEC-16				
	Surrogate: 1,4-Difluorobenzene	99.1		70-130	%	30-DEC-16				
Hydrocarbons										
	F1 (C6-C10)	<25		25	ug/L	30-DEC-16	750	750		
	F1-BTEX	<25		25	ug/L	30-DEC-16	750	750		
	F2 (C10-C16)	<100		100	ug/L	29-DEC-16	150	150		
	F3 (C16-C34)	<250		250	ug/L	29-DEC-16	500	500		
	F4 (C34-C50)	<250		250	ug/L	29-DEC-16	500	500		
	Total Hydrocarbons (C6-C50)	<370		370	ug/L	30-DEC-16				
	Chrom. to baseline at nC50	YES			No Unit	29-DEC-16				
	Surrogate: 2-Bromobenzotrifluoride	91.0		60-140	%	29-DEC-16				
	Surrogate: 3,4-Dichlorotoluene	74.3		60-140	%	30-DEC-16				
L1874349-3	MW16-4									
Sampled By:	CLIENT on 26-DEC-16 @ 10:00									
Matrix:	WATER						#1	#2		
Physical Tests										

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use **#2: T2-Ground Water (Fine Soil)-All Types of Property Use**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1874349-3 MW16-4							
Sampled By: CLIENT on 26-DEC-16 @ 10:00							
Matrix: WATER							
Physical Tests							
Conductivity	0.936		0.0030	mS/cm	29-DEC-16		
pH	7.80		0.10	pH units	30-DEC-16		
Anions and Nutrients							
Chloride (Cl)	122		0.50	mg/L	30-DEC-16	790	790
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L	29-DEC-16	66	66
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD			No Unit	29-DEC-16		
Dissolved Metals Filtration Location	FIELD			No Unit	29-DEC-16		
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	6	6
Arsenic (As)-Dissolved	0.11		0.10	ug/L	30-DEC-16	25	25
Barium (Ba)-Dissolved	83.2		0.10	ug/L	30-DEC-16	1000	1000
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	4	4
Boron (B)-Dissolved	74		10	ug/L	30-DEC-16	5000	5000
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2.7	2.7
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	50	50
Cobalt (Co)-Dissolved	0.58		0.10	ug/L	30-DEC-16	3.8	3.8
Copper (Cu)-Dissolved	0.99		0.20	ug/L	30-DEC-16	87	87
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	10	10
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	29-DEC-16	0.29	1
Molybdenum (Mo)-Dissolved	1.23		0.050	ug/L	30-DEC-16	70	70
Nickel (Ni)-Dissolved	1.03		0.50	ug/L	30-DEC-16	100	100
Selenium (Se)-Dissolved	0.362		0.050	ug/L	30-DEC-16	10	10
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	1.5	1.5
Sodium (Na)-Dissolved	86900		500	ug/L	30-DEC-16	490000	490000
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2	2
Uranium (U)-Dissolved	0.765		0.010	ug/L	30-DEC-16	20	20
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	6.2	6.2
Zinc (Zn)-Dissolved	<1.0		1.0	ug/L	30-DEC-16	1100	1100
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L	30-DEC-16	25	25
Volatile Organic Compounds							
Acetone	<30		30	ug/L	30-DEC-16	2700	2700
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L1874349-3 MW16-4									
Sampled By: CLIENT on 26-DEC-16 @ 10:00									
Matrix: WATER									
Volatile Organic Compounds									
Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590		
1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5		
1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14		
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50		
1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5		
cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5		
Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4		
n-Hexane	<0.50		0.50	ug/L	30-DEC-16	51	520		
Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800		
Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640		
MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15		
Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4		
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1		
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1		
Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24		
1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200		
1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5		
Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150		
Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7		
o-Xylene	<0.30		0.30	ug/L	30-DEC-16				
m+p-Xylenes	<0.40		0.40	ug/L	30-DEC-16				
Xylenes (Total)	<0.50		0.50	ug/L	30-DEC-16	300	300		
Surrogate: 4-Bromofluorobenzene	96.1		70-130	%	30-DEC-16				
Surrogate: 1,4-Difluorobenzene	99.0		70-130	%	30-DEC-16				
Hydrocarbons									
F1 (C6-C10)	<25		25	ug/L	30-DEC-16	750	750		
F1-BTEX	<25		25	ug/L	30-DEC-16	750	750		
F2 (C10-C16)	<100		100	ug/L	29-DEC-16	150	150		
F3 (C16-C34)	<250		250	ug/L	29-DEC-16	500	500		
F4 (C34-C50)	<250		250	ug/L	29-DEC-16	500	500		
Total Hydrocarbons (C6-C50)	<370		370	ug/L	30-DEC-16				
Chrom. to baseline at nC50	YES			No Unit	29-DEC-16				
Surrogate: 2-Bromobenzotrifluoride	97.7		60-140	%	29-DEC-16				
Surrogate: 3,4-Dichlorotoluene	70.3		60-140	%	30-DEC-16				
L1874349-4 MW16-5									
Sampled By: CLIENT on 26-DEC-16 @ 09:00									
Matrix: WATER						#1	#2		
Physical Tests									

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use **#2: T2-Ground Water (Fine Soil)-All Types of Property Use**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	#2		
L1874349-4 MW16-5									
Sampled By: CLIENT on 26-DEC-16 @ 09:00									
Matrix: WATER									
Physical Tests									
Conductivity	1.14		0.0030	mS/cm	29-DEC-16				
pH	7.69		0.10	pH units	30-DEC-16				
Anions and Nutrients									
Chloride (Cl)	175		0.50	mg/L	30-DEC-16	790	790		
Cyanides									
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L	29-DEC-16	66	66		
Dissolved Metals									
Dissolved Mercury Filtration Location	FIELD			No Unit	29-DEC-16				
Dissolved Metals Filtration Location	FIELD			No Unit	29-DEC-16				
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	6	6		
Arsenic (As)-Dissolved	0.14		0.10	ug/L	30-DEC-16	25	25		
Barium (Ba)-Dissolved	114		0.10	ug/L	30-DEC-16	1000	1000		
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	4	4		
Boron (B)-Dissolved	77		10	ug/L	30-DEC-16	5000	5000		
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2.7	2.7		
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	50	50		
Cobalt (Co)-Dissolved	0.60		0.10	ug/L	30-DEC-16	3.8	3.8		
Copper (Cu)-Dissolved	0.85		0.20	ug/L	30-DEC-16	87	87		
Lead (Pb)-Dissolved	0.065		0.050	ug/L	30-DEC-16	10	10		
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	29-DEC-16	0.29	1		
Molybdenum (Mo)-Dissolved	3.35		0.050	ug/L	30-DEC-16	70	70		
Nickel (Ni)-Dissolved	1.49		0.50	ug/L	30-DEC-16	100	100		
Selenium (Se)-Dissolved	0.397		0.050	ug/L	30-DEC-16	10	10		
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	1.5	1.5		
Sodium (Na)-Dissolved	108000	DLHC	5000	ug/L	30-DEC-16	490000	490000		
Thallium (Tl)-Dissolved	0.011		0.010	ug/L	30-DEC-16	2	2		
Uranium (U)-Dissolved	0.859		0.010	ug/L	30-DEC-16	20	20		
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	6.2	6.2		
Zinc (Zn)-Dissolved	<1.0		1.0	ug/L	30-DEC-16	1100	1100		
Speciated Metals									
Chromium, Hexavalent	<1.0		1.0	ug/L	30-DEC-16	25	25		
Volatile Organic Compounds									
Acetone	<30		30	ug/L	30-DEC-16	2700	2700		
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5		
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16		
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25		
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89		
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5		
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30		
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25		
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22		
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2		
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3		
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59		
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L1874349-4 MW16-5									
Sampled By: CLIENT on 26-DEC-16 @ 09:00									
Matrix: WATER									
Volatile Organic Compounds									
Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590		
1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5		
1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14		
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50		
1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5		
cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5		
Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4		
n-Hexane	<0.50		0.50	ug/L	30-DEC-16	51	520		
Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800		
Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640		
MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15		
Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4		
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1		
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1		
Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24		
1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200		
1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5		
Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150		
Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7		
o-Xylene	<0.30		0.30	ug/L	30-DEC-16				
m+p-Xylenes	<0.40		0.40	ug/L	30-DEC-16				
Xylenes (Total)	<0.50		0.50	ug/L	30-DEC-16	300	300		
Surrogate: 4-Bromofluorobenzene	96.2		70-130	%	30-DEC-16				
Surrogate: 1,4-Difluorobenzene	100.2		70-130	%	30-DEC-16				
Hydrocarbons									
F1 (C6-C10)	<25		25	ug/L	30-DEC-16	750	750		
F1-BTEX	<25		25	ug/L	30-DEC-16	750	750		
F2 (C10-C16)	<100		100	ug/L	30-DEC-16	150	150		
F3 (C16-C34)	<250		250	ug/L	30-DEC-16	500	500		
F4 (C34-C50)	<250		250	ug/L	30-DEC-16	500	500		
Total Hydrocarbons (C6-C50)	<370		370	ug/L	30-DEC-16				
Chrom. to baseline at nC50	YES			No Unit	30-DEC-16				
Surrogate: 2-Bromobenzotrifluoride	94.5		60-140	%	30-DEC-16				
Surrogate: 3,4-Dichlorotoluene	85.9		60-140	%	30-DEC-16				
L1874349-5 MW16-105									
Sampled By: CLIENT on 26-DEC-16 @ 09:00									
Matrix: WATER						#1	#2		
Physical Tests									

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use **#2: T2-Ground Water (Fine Soil)-All Types of Property Use**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1874349-5 MW16-105							
Sampled By: CLIENT on 26-DEC-16 @ 09:00							
Matrix: WATER							
Physical Tests							
Conductivity	1.13		0.0030	mS/cm	29-DEC-16		
pH	7.72		0.10	pH units	30-DEC-16		
Anions and Nutrients							
Chloride (Cl)	180		0.50	mg/L	30-DEC-16	790	790
Cyanides							
Cyanide, Weak Acid Diss	<2.0		2.0	ug/L	29-DEC-16	66	66
Dissolved Metals							
Dissolved Mercury Filtration Location	FIELD			No Unit	29-DEC-16		
Dissolved Metals Filtration Location	FIELD			No Unit	29-DEC-16		
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	6	6
Arsenic (As)-Dissolved	0.12		0.10	ug/L	30-DEC-16	25	25
Barium (Ba)-Dissolved	111		0.10	ug/L	30-DEC-16	1000	1000
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	30-DEC-16	4	4
Boron (B)-Dissolved	76		10	ug/L	30-DEC-16	5000	5000
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2.7	2.7
Chromium (Cr)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	50	50
Cobalt (Co)-Dissolved	0.57		0.10	ug/L	30-DEC-16	3.8	3.8
Copper (Cu)-Dissolved	0.80		0.20	ug/L	30-DEC-16	87	87
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	10	10
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	29-DEC-16	0.29	1
Molybdenum (Mo)-Dissolved	3.40		0.050	ug/L	30-DEC-16	70	70
Nickel (Ni)-Dissolved	1.53		0.50	ug/L	30-DEC-16	100	100
Selenium (Se)-Dissolved	0.407		0.050	ug/L	30-DEC-16	10	10
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	30-DEC-16	1.5	1.5
Sodium (Na)-Dissolved	108000	DLHC	5000	ug/L	30-DEC-16	490000	490000
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	30-DEC-16	2	2
Uranium (U)-Dissolved	0.844		0.010	ug/L	30-DEC-16	20	20
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	30-DEC-16	6.2	6.2
Zinc (Zn)-Dissolved	<1.0		1.0	ug/L	30-DEC-16	1100	1100
Speciated Metals							
Chromium, Hexavalent	<1.0		1.0	ug/L	30-DEC-16	25	25
Volatile Organic Compounds							
Acetone	<30		30	ug/L	30-DEC-16	2700	2700
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2		
L1874349-5 MW16-105									
Sampled By: CLIENT on 26-DEC-16 @ 09:00									
Matrix: WATER									
Volatile Organic Compounds									
Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590		
1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5		
1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14		
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50		
1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5		
cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16				
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5		
Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4		
n-Hexane	<0.50		0.50	ug/L	30-DEC-16	51	520		
Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800		
Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640		
MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15		
Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4		
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1		
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1		
Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17		
Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24		
1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200		
1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5		
Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5		
Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150		
Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7		
o-Xylene	<0.30		0.30	ug/L	30-DEC-16				
m+p-Xylenes	<0.40		0.40	ug/L	30-DEC-16				
Xylenes (Total)	<0.50		0.50	ug/L	30-DEC-16	300	300		
Surrogate: 4-Bromofluorobenzene	96.3		70-130	%	30-DEC-16				
Surrogate: 1,4-Difluorobenzene	100.4		70-130	%	30-DEC-16				
Hydrocarbons									
F1 (C6-C10)	<25		25	ug/L	30-DEC-16	750	750		
F1-BTEX	<25		25	ug/L	30-DEC-16	750	750		
F2 (C10-C16)	<100		100	ug/L	30-DEC-16	150	150		
F3 (C16-C34)	<250		250	ug/L	30-DEC-16	500	500		
F4 (C34-C50)	<250		250	ug/L	30-DEC-16	500	500		
Total Hydrocarbons (C6-C50)	<370		370	ug/L	30-DEC-16				
Chrom. to baseline at nC50	YES			No Unit	30-DEC-16				
Surrogate: 2-Bromobenzotrifluoride	102.1		60-140	%	30-DEC-16				
Surrogate: 3,4-Dichlorotoluene	82.7		60-140	%	30-DEC-16				
L1874349-6 TRIP BLANK									
Sampled By: CLIENT on 26-DEC-16									
Matrix: WATER						#1	#2		
Volatile Organic Compounds									

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use **#2: T2-Ground Water (Fine Soil)-All Types of Property Use**

Sample Details Grouping / Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits #1	Guideline Limits #2
L1874349-6 TRIP BLANK							
Sampled By: CLIENT on 26-DEC-16							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<30		30	ug/L	30-DEC-16	2700	2700
Benzene	<0.50		0.50	ug/L	30-DEC-16	5	5
Bromodichloromethane	<2.0		2.0	ug/L	30-DEC-16	16	16
Bromoform	<5.0		5.0	ug/L	30-DEC-16	25	25
Bromomethane	<0.50		0.50	ug/L	30-DEC-16	0.89	0.89
Carbon tetrachloride	<0.20		0.20	ug/L	30-DEC-16	0.79	5
Chlorobenzene	<0.50		0.50	ug/L	30-DEC-16	30	30
Dibromochloromethane	<2.0		2.0	ug/L	30-DEC-16	25	25
Chloroform	<1.0		1.0	ug/L	30-DEC-16	2.4	22
1,2-Dibromoethane	<0.20		0.20	ug/L	30-DEC-16	0.2	0.2
1,2-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	3	3
1,3-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	59	59
1,4-Dichlorobenzene	<0.50		0.50	ug/L	30-DEC-16	1	1
Dichlorodifluoromethane	<2.0		2.0	ug/L	30-DEC-16	590	590
1,1-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	5	5
1,2-Dichloroethane	<0.50		0.50	ug/L	30-DEC-16	1.6	5
1,1-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	14
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17
Methylene Chloride	<5.0		5.0	ug/L	30-DEC-16	50	50
1,2-Dichloropropane	<0.50		0.50	ug/L	30-DEC-16	5	5
cis-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16		
trans-1,3-Dichloropropene	<0.30		0.30	ug/L	30-DEC-16		
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L	30-DEC-16	0.5	0.5
Ethylbenzene	<0.50		0.50	ug/L	30-DEC-16	2.4	2.4
n-Hexane	<0.50		0.50	ug/L	30-DEC-16	51	520
Methyl Ethyl Ketone	<20		20	ug/L	30-DEC-16	1800	1800
Methyl Isobutyl Ketone	<20		20	ug/L	30-DEC-16	640	640
MTBE	<2.0		2.0	ug/L	30-DEC-16	15	15
Styrene	<0.50		0.50	ug/L	30-DEC-16	5.4	5.4
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1.1	1.1
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L	30-DEC-16	1	1
Tetrachloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	17
Toluene	<0.50		0.50	ug/L	30-DEC-16	24	24
1,1,1-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	200	200
1,1,2-Trichloroethane	<0.50		0.50	ug/L	30-DEC-16	4.7	5
Trichloroethylene	<0.50		0.50	ug/L	30-DEC-16	1.6	5
Trichlorofluoromethane	<5.0		5.0	ug/L	30-DEC-16	150	150
Vinyl chloride	<0.50		0.50	ug/L	30-DEC-16	0.5	1.7
o-Xylene	<0.30		0.30	ug/L	30-DEC-16		
m+p-Xylenes	<0.40		0.40	ug/L	30-DEC-16		
Xylenes (Total)	<0.50		0.50	ug/L	30-DEC-16	300	300
Surrogate: 4-Bromofluorobenzene	95.6		70-130	%	30-DEC-16		
Surrogate: 1,4-Difluorobenzene	100.5		70-130	%	30-DEC-16		

** Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.
* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

Ontario Regulation 153/04 - April 15, 2011 Standards = [Suite] - T2-POTABLE-GROUNDWATER-ALL-TYPES-OF-PROPERTY-USE

#1: T2-Ground Water (Coarse Soil)-All Types of Property Use

#2: T2-Ground Water (Fine Soil)-All Types of Property Use

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
CL-IC-WT	Water	Chloride by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CN-WAD-R511-WT	Water	Cyanide (WAD)-O.Reg 153/04	APHA 4500CN I-Weak acid Dist Colorimet

Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199

This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

EC-R511-WT	Water	Conductivity-O.Reg 153/04 (July 2011)	APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
In samples where BTEX and F1 were analyzed , F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:
1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:
1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	MOE DECPH-E3398/CCME TIER 1

Fractions F2, F3 and F4 are determined by liquid/liquid extraction with a solvent. The solvent recovered from the extracted sample is treated with silica gel to remove polar material and then analyzed by GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

Reference Information

HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8

The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT	Water	pH	APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011). Holdtime for samples under this regulation is 28 days

VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

*** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

14-447345

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information.

Quality Control Report

Workorder: L1874349 Report Date: 30-DEC-16

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
CL-IC-WT	**Water**							
Batch R3625226								
WG2458486-4 DUP		**WG2458486-3**						
Chloride (Cl)		3.41	3.29		mg/L	3.5	25	30-DEC-16
WG2458486-2 LCS								
Chloride (Cl)			99.9		%		70-130	30-DEC-16
WG2458486-1 MB								
Chloride (Cl)			<0.50		mg/L		0.5	30-DEC-16
WG2458486-5 MS		**WG2458486-3**						
Chloride (Cl)			99.9		%		70-130	30-DEC-16
CN-WAD-R511-WT	**Water**							
Batch R3625535								
WG2458043-3 DUP		**L1872510-1**						
Cyanide, Weak Acid Diss		<2.0	<2.0	RPD-NA	ug/L	N/A	20	29-DEC-16
WG2458043-2 LCS								
Cyanide, Weak Acid Diss			100.2		%		80-120	29-DEC-16
WG2458043-1 MB								
Cyanide, Weak Acid Diss			<2.0		ug/L		2	29-DEC-16
WG2458043-4 MS		**L1872510-1**						
Cyanide, Weak Acid Diss			75.8		%		70-130	29-DEC-16
CR-CR6-IC-R511-WT	**Water**							
Batch R3625700								
WG2458516-4 DUP		**WG2458516-3**						
Chromium, Hexavalent		<1.0	<1.0	RPD-NA	ug/L	N/A	20	30-DEC-16
WG2458516-2 LCS								
Chromium, Hexavalent			98.7		%		80-120	30-DEC-16
WG2458516-1 MB								
Chromium, Hexavalent			<1.0		ug/L		1	30-DEC-16
WG2458516-5 MS		**WG2458516-3**						
Chromium, Hexavalent			100.0		%		70-130	30-DEC-16
EC-R511-WT	**Water**							
Batch R3625654								
WG2457988-8 DUP		**WG2457988-7**						
Conductivity		1.98	1.99		mS/cm	0.5	10	29-DEC-16
WG2457988-5 LCS								
Conductivity			104.4		%		90-110	29-DEC-16
WG2457988-6 MB								
Conductivity			<0.0030		mS/cm		0.003	29-DEC-16
F1-HS-511-WT	**Water**							

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F1-HS-511-WT	**Water**							
Batch R3625315								
WG2454520-4 DUP		**WG2454520-3**						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	30-DEC-16
WG2454520-1 LCS								
F1 (C6-C10)			86.4		%		80-120	30-DEC-16
WG2454520-2 MB								
F1 (C6-C10)			<25		ug/L		25	30-DEC-16
Surrogate: 3,4-Dichlorotoluene			99.7		%		60-140	30-DEC-16
WG2454520-5 MS		**WG2454520-3**						
F1 (C6-C10)			86.1		%		60-140	30-DEC-16
F2-F4-511-WT	**Water**							
Batch R3625123								
WG2458274-2 LCS								
F2 (C10-C16)			104.3		%		70-130	29-DEC-16
F3 (C16-C34)			96.8		%		70-130	29-DEC-16
F4 (C34-C50)			97.1		%		70-130	29-DEC-16
WG2458274-3 LCSD		**WG2458274-2**						
F2 (C10-C16)		104.3	112.5		%	7.6	50	29-DEC-16
F3 (C16-C34)		96.8	103.9		%	7.1	50	29-DEC-16
F4 (C34-C50)		97.1	101.8		%	4.7	50	29-DEC-16
WG2458274-1 MB								
F2 (C10-C16)			<100		ug/L		100	29-DEC-16
F3 (C16-C34)			<250		ug/L		250	29-DEC-16
F4 (C34-C50)			<250		ug/L		250	29-DEC-16
Surrogate: 2-Bromobenzotrifluoride			95.2		%		60-140	29-DEC-16
Batch R3625658								
WG2458510-2 LCS								
F2 (C10-C16)			110.0		%		70-130	30-DEC-16
F3 (C16-C34)			105.8		%		70-130	30-DEC-16
F4 (C34-C50)			110.5		%		70-130	30-DEC-16
WG2458510-3 LCSD		**WG2458510-2**						
F2 (C10-C16)		110.0	108.3		%	1.5	50	30-DEC-16
F3 (C16-C34)		105.8	103.3		%	2.4	50	30-DEC-16
F4 (C34-C50)		110.5	108.2		%	2.1	50	30-DEC-16
WG2458510-1 MB								
F2 (C10-C16)			<100		ug/L		100	30-DEC-16
F3 (C16-C34)			<250		ug/L		250	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F2-F4-511-WT	**Water**							
Batch R3625658								
WG2458510-1 MB								
F4 (C34-C50)			<250		ug/L		250	30-DEC-16
Surrogate: 2-Bromobenzotrifluoride			96.8		%		60-140	30-DEC-16
HG-D-UG/L-CVAA-WT	**Water**							
Batch R3624997								
WG2458197-3 DUP		**L1874349-1**						
Mercury (Hg)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	29-DEC-16
WG2458197-2 LCS								
Mercury (Hg)-Dissolved			93.7		%		80-120	29-DEC-16
WG2458197-1 MB								
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	29-DEC-16
WG2458197-4 MS		**L1874349-2**						
Mercury (Hg)-Dissolved			88.5		%		70-130	29-DEC-16
MET-D-UG/L-MS-WT	**Water**							
Batch R3625611								
WG2458275-4 DUP		**WG2458275-3**						
Antimony (Sb)-Dissolved		0.13	0.12		ug/L	9.9	20	30-DEC-16
Arsenic (As)-Dissolved		0.11	0.11		ug/L	2.8	20	30-DEC-16
Barium (Ba)-Dissolved		84.7	81.7		ug/L	3.5	20	30-DEC-16
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	30-DEC-16
Boron (B)-Dissolved		29	29		ug/L	0.6	20	30-DEC-16
Cadmium (Cd)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	30-DEC-16
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	30-DEC-16
Cobalt (Co)-Dissolved		0.19	0.19		ug/L	0.5	20	30-DEC-16
Copper (Cu)-Dissolved		1.06	1.14		ug/L	7.3	20	30-DEC-16
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	30-DEC-16
Molybdenum (Mo)-Dissolved		5.58	5.68		ug/L	1.8	20	30-DEC-16
Nickel (Ni)-Dissolved		0.93	0.99		ug/L	5.7	20	30-DEC-16
Selenium (Se)-Dissolved		0.594	0.607		ug/L	2.1	20	30-DEC-16
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	30-DEC-16
Sodium (Na)-Dissolved		93300	93900		ug/L	0.7	20	30-DEC-16
Thallium (Tl)-Dissolved		0.011	<0.010	RPD-NA	ug/L	N/A	20	30-DEC-16
Uranium (U)-Dissolved		0.798	0.795		ug/L	0.3	20	30-DEC-16
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	30-DEC-16
Zinc (Zn)-Dissolved		1.5	1.6		ug/L	4.0	20	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch	**R3625611**							
WG2458275-2	**LCS**							
Antimony (Sb)-Dissolved			99.97		%		80-120	30-DEC-16
Arsenic (As)-Dissolved			98.1		%		80-120	30-DEC-16
Barium (Ba)-Dissolved			99.99		%		80-120	30-DEC-16
Beryllium (Be)-Dissolved			92.9		%		80-120	30-DEC-16
Boron (B)-Dissolved			93.5		%		80-120	30-DEC-16
Cadmium (Cd)-Dissolved			97.9		%		80-120	30-DEC-16
Chromium (Cr)-Dissolved			95.4		%		80-120	30-DEC-16
Cobalt (Co)-Dissolved			95.7		%		80-120	30-DEC-16
Copper (Cu)-Dissolved			94.0		%		80-120	30-DEC-16
Lead (Pb)-Dissolved			99.6		%		80-120	30-DEC-16
Molybdenum (Mo)-Dissolved			94.0		%		80-120	30-DEC-16
Nickel (Ni)-Dissolved			94.3		%		80-120	30-DEC-16
Selenium (Se)-Dissolved			94.3		%		80-120	30-DEC-16
Silver (Ag)-Dissolved			100.9		%		80-120	30-DEC-16
Sodium (Na)-Dissolved			95.6		%		80-120	30-DEC-16
Thallium (Tl)-Dissolved			98.3		%		80-120	30-DEC-16
Uranium (U)-Dissolved			101.2		%		80-120	30-DEC-16
Vanadium (V)-Dissolved			96.9		%		80-120	30-DEC-16
Zinc (Zn)-Dissolved			91.3		%		80-120	30-DEC-16
WG2458275-1	**MB**							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	30-DEC-16
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	30-DEC-16
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	30-DEC-16
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	30-DEC-16
Boron (B)-Dissolved			<10		ug/L		10	30-DEC-16
Cadmium (Cd)-Dissolved			<0.010		ug/L		0.01	30-DEC-16
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	30-DEC-16
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	30-DEC-16
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	30-DEC-16
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	30-DEC-16
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	30-DEC-16
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	30-DEC-16
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	30-DEC-16
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-UG/L-MS-WT	**Water**							
Batch R3625611								
WG2458275-1 MB								
Sodium (Na)-Dissolved			<500		ug/L		500	30-DEC-16
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	30-DEC-16
Uranium (U)-Dissolved			<0.010		ug/L		0.01	30-DEC-16
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	30-DEC-16
Zinc (Zn)-Dissolved			<1.0		ug/L		1	30-DEC-16
WG2458275-5 MS		**WG2458275-3**						
Antimony (Sb)-Dissolved			104.6		%		70-130	30-DEC-16
Arsenic (As)-Dissolved			104.2		%		70-130	30-DEC-16
Barium (Ba)-Dissolved			N/A	MS-B	%		-	30-DEC-16
Beryllium (Be)-Dissolved			96.3		%		70-130	30-DEC-16
Boron (B)-Dissolved			94.3		%		70-130	30-DEC-16
Cadmium (Cd)-Dissolved			96.5		%		70-130	30-DEC-16
Chromium (Cr)-Dissolved			96.9		%		70-130	30-DEC-16
Cobalt (Co)-Dissolved			95.3		%		70-130	30-DEC-16
Copper (Cu)-Dissolved			94.6		%		70-130	30-DEC-16
Lead (Pb)-Dissolved			95.5		%		70-130	30-DEC-16
Molybdenum (Mo)-Dissolved			91.9		%		70-130	30-DEC-16
Nickel (Ni)-Dissolved			93.2		%		70-130	30-DEC-16
Selenium (Se)-Dissolved			102.3		%		70-130	30-DEC-16
Silver (Ag)-Dissolved			98.1		%		70-130	30-DEC-16
Sodium (Na)-Dissolved			N/A	MS-B	%		-	30-DEC-16
Thallium (Tl)-Dissolved			94.1		%		70-130	30-DEC-16
Uranium (U)-Dissolved			N/A	MS-B	%		-	30-DEC-16
Vanadium (V)-Dissolved			103.0		%		70-130	30-DEC-16
Zinc (Zn)-Dissolved			96.8		%		70-130	30-DEC-16
PH-WT	**Water**							
Batch R3625695								
WG2458680-3 DUP		**WG2458680-2**						
pH		6.53	6.38	J	pH units	0.15	0.2	30-DEC-16
WG2458680-1 LCS								
pH			6.98		pH units		6.9-7.1	30-DEC-16
VOC-511-HS-WT	**Water**							

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R3625315								
WG2454520-4 DUP		**WG2454520-3**						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-DEC-16
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	30-DEC-16
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-DEC-16
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-DEC-16
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	30-DEC-16
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	30-DEC-16
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-DEC-16
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-DEC-16
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-DEC-16
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
n-Hexane		0.88	0.86		ug/L	2.3	30	30-DEC-16
m+p-Xylenes		0.58	0.61		ug/L	5.0	30	30-DEC-16
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-DEC-16
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	30-DEC-16
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-DEC-16
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	30-DEC-16
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-DEC-16
Styrene		<0.50	<0.50		ug/L			30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R3625315								
WG2454520-4 DUP		**WG2454520-3**						
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	30-DEC-16
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	30-DEC-16
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	30-DEC-16
WG2454520-1 LCS								
1,1,1,2-Tetrachloroethane			97.2		%		70-130	30-DEC-16
1,1,2,2-Tetrachloroethane			114.8		%		70-130	30-DEC-16
1,1,1-Trichloroethane			94.8		%		70-130	30-DEC-16
1,1,2-Trichloroethane			104.0		%		70-130	30-DEC-16
1,1-Dichloroethane			103.8		%		70-130	30-DEC-16
1,1-Dichloroethylene			93.9		%		70-130	30-DEC-16
1,2-Dibromoethane			105.2		%		70-130	30-DEC-16
1,2-Dichlorobenzene			97.4		%		70-130	30-DEC-16
1,2-Dichloroethane			107.0		%		70-130	30-DEC-16
1,2-Dichloropropane			102.4		%		70-130	30-DEC-16
1,3-Dichlorobenzene			92.0		%		70-130	30-DEC-16
1,4-Dichlorobenzene			95.2		%		70-130	30-DEC-16
Acetone			118.4		%		60-140	30-DEC-16
Benzene			100.4		%		70-130	30-DEC-16
Bromodichloromethane			100.5		%		70-130	30-DEC-16
Bromoform			105.5		%		70-130	30-DEC-16
Bromomethane			97.7		%		60-140	30-DEC-16
Carbon tetrachloride			92.5		%		70-130	30-DEC-16
Chlorobenzene			99.1		%		70-130	30-DEC-16
Chloroform			99.8		%		70-130	30-DEC-16
cis-1,2-Dichloroethylene			99.95		%		70-130	30-DEC-16
cis-1,3-Dichloropropene			101.1		%		70-130	30-DEC-16
Dibromochloromethane			107.6		%		70-130	30-DEC-16
Dichlorodifluoromethane			69.1		%		50-140	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R3625315								
WG2454520-1 LCS								
Ethylbenzene			100.6		%		70-130	30-DEC-16
n-Hexane			94.8		%		70-130	30-DEC-16
m+p-Xylenes			101.8		%		70-130	30-DEC-16
Methyl Ethyl Ketone			112.6		%		60-140	30-DEC-16
Methyl Isobutyl Ketone			105.4		%		60-140	30-DEC-16
Methylene Chloride			104.4		%		70-130	30-DEC-16
MTBE			94.9		%		70-130	30-DEC-16
o-Xylene			102.2		%		70-130	30-DEC-16
Styrene			103.7		%		70-130	30-DEC-16
Tetrachloroethylene			90.1		%		70-130	30-DEC-16
Toluene			93.6		%		70-130	30-DEC-16
trans-1,2-Dichloroethylene			94.9		%		70-130	30-DEC-16
trans-1,3-Dichloropropene			100.3		%		70-130	30-DEC-16
Trichloroethylene			94.8		%		70-130	30-DEC-16
Trichlorofluoromethane			96.5		%		60-140	30-DEC-16
Vinyl chloride			87.4		%		60-140	30-DEC-16
WG2454520-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	30-DEC-16
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	30-DEC-16
1,1,1-Trichloroethane			<0.50		ug/L		0.5	30-DEC-16
1,1,2-Trichloroethane			<0.50		ug/L		0.5	30-DEC-16
1,1-Dichloroethane			<0.50		ug/L		0.5	30-DEC-16
1,1-Dichloroethylene			<0.50		ug/L		0.5	30-DEC-16
1,2-Dibromoethane			<0.20		ug/L		0.2	30-DEC-16
1,2-Dichlorobenzene			<0.50		ug/L		0.5	30-DEC-16
1,2-Dichloroethane			<0.50		ug/L		0.5	30-DEC-16
1,2-Dichloropropane			<0.50		ug/L		0.5	30-DEC-16
1,3-Dichlorobenzene			<0.50		ug/L		0.5	30-DEC-16
1,4-Dichlorobenzene			<0.50		ug/L		0.5	30-DEC-16
Acetone			<30		ug/L		30	30-DEC-16
Benzene			<0.50		ug/L		0.5	30-DEC-16
Bromodichloromethane			<2.0		ug/L		2	30-DEC-16
Bromoform			<5.0		ug/L		5	30-DEC-16
Bromomethane			<0.50		ug/L		0.5	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R3625315								
WG2454520-2 MB								
Carbon tetrachloride			<0.20		ug/L		0.2	30-DEC-16
Chlorobenzene			<0.50		ug/L		0.5	30-DEC-16
Chloroform			<1.0		ug/L		1	30-DEC-16
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-DEC-16
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	30-DEC-16
Dibromochloromethane			<2.0		ug/L		2	30-DEC-16
Dichlorodifluoromethane			<2.0		ug/L		2	30-DEC-16
Ethylbenzene			<0.50		ug/L		0.5	30-DEC-16
n-Hexane			<0.50		ug/L		0.5	30-DEC-16
m+p-Xylenes			<0.40		ug/L		0.4	30-DEC-16
Methyl Ethyl Ketone			<20		ug/L		20	30-DEC-16
Methyl Isobutyl Ketone			<20		ug/L		20	30-DEC-16
Methylene Chloride			<5.0		ug/L		5	30-DEC-16
MTBE			<2.0		ug/L		2	30-DEC-16
o-Xylene			<0.30		ug/L		0.3	30-DEC-16
Styrene			<0.50		ug/L		0.5	30-DEC-16
Tetrachloroethylene			<0.50		ug/L		0.5	30-DEC-16
Toluene			<0.50		ug/L		0.5	30-DEC-16
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	30-DEC-16
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	30-DEC-16
Trichloroethylene			<0.50		ug/L		0.5	30-DEC-16
Trichlorofluoromethane			<5.0		ug/L		5	30-DEC-16
Vinyl chloride			<0.50		ug/L		0.5	30-DEC-16
Surrogate: 1,4-Difluorobenzene			99.4		%		70-130	30-DEC-16
Surrogate: 4-Bromofluorobenzene			98.8		%		70-130	30-DEC-16
WG2454520-5 MS		**WG2454520-3**						
1,1,1,2-Tetrachloroethane			96.0		%		50-140	30-DEC-16
1,1,2,2-Tetrachloroethane			114.8		%		50-140	30-DEC-16
1,1,1-Trichloroethane			94.4		%		50-140	30-DEC-16
1,1,2-Trichloroethane			105.4		%		50-140	30-DEC-16
1,1-Dichloroethane			93.1		%		50-140	30-DEC-16
1,1-Dichloroethylene			91.8		%		50-140	30-DEC-16
1,2-Dibromoethane			107.8		%		50-140	30-DEC-16
1,2-Dichlorobenzene			98.4		%		50-140	30-DEC-16

Quality Control Report

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-511-HS-WT	**Water**							
Batch R3625315								
WG2454520-5 MS		**WG2454520-3**						
1,2-Dichloroethane			111.2		%		50-140	30-DEC-16
1,2-Dichloropropane			105.2		%		50-140	30-DEC-16
1,3-Dichlorobenzene			91.8		%		50-140	30-DEC-16
1,4-Dichlorobenzene			94.8		%		50-140	30-DEC-16
Acetone			123.4		%		50-140	30-DEC-16
Benzene			101.4		%		50-140	30-DEC-16
Bromodichloromethane			103.5		%		50-140	30-DEC-16
Bromoform			106.4		%		50-140	30-DEC-16
Bromomethane			95.6		%		50-140	30-DEC-16
Carbon tetrachloride			92.0		%		50-140	30-DEC-16
Chlorobenzene			97.0		%		50-140	30-DEC-16
Chloroform			101.9		%		50-140	30-DEC-16
cis-1,2-Dichloroethylene			101.0		%		50-140	30-DEC-16
cis-1,3-Dichloropropene			103.0		%		50-140	30-DEC-16
Dibromochloromethane			108.7		%		50-140	30-DEC-16
Dichlorodifluoromethane			63.0		%		50-140	30-DEC-16
Ethylbenzene			96.7		%		50-140	30-DEC-16
n-Hexane			91.7		%		50-140	30-DEC-16
m+p-Xylenes			98.1		%		50-140	30-DEC-16
Methyl Ethyl Ketone			125.6		%		50-140	30-DEC-16
Methyl Isobutyl Ketone			115.4		%		50-140	30-DEC-16
Methylene Chloride			105.8		%		50-140	30-DEC-16
MTBE			94.9		%		50-140	30-DEC-16
o-Xylene			99.3		%		50-140	30-DEC-16
Styrene			98.3		%		50-140	30-DEC-16
Tetrachloroethylene			86.6		%		50-140	30-DEC-16
Toluene			90.5		%		50-140	30-DEC-16
trans-1,2-Dichloroethylene			94.4		%		50-140	30-DEC-16
trans-1,3-Dichloropropene			99.9		%		50-140	30-DEC-16
Trichloroethylene			94.7		%		50-140	30-DEC-16
Trichlorofluoromethane			93.3		%		50-140	30-DEC-16
Vinyl chloride			84.0		%		50-140	30-DEC-16

Quality Control Report

Workorder: L1874349 Report Date: 30-DEC-16

Client: WSP Canada Inc. (Ottawa)
2611 Queensview Dr Suite 300
Ottawa ON K2B 8K2
Contact: Kathryn Maton

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

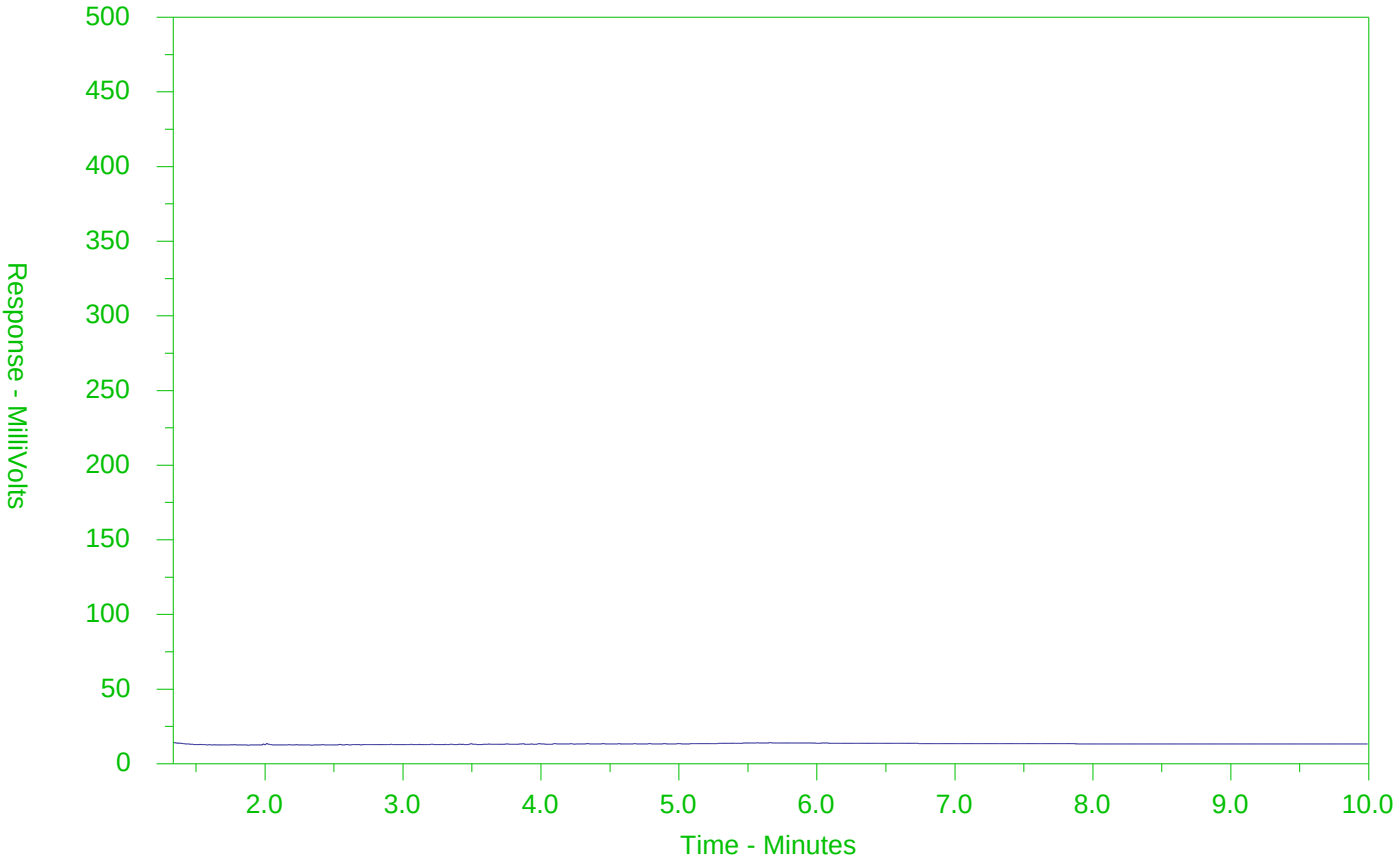
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1874349-1
Client Sample ID: MW16-2



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

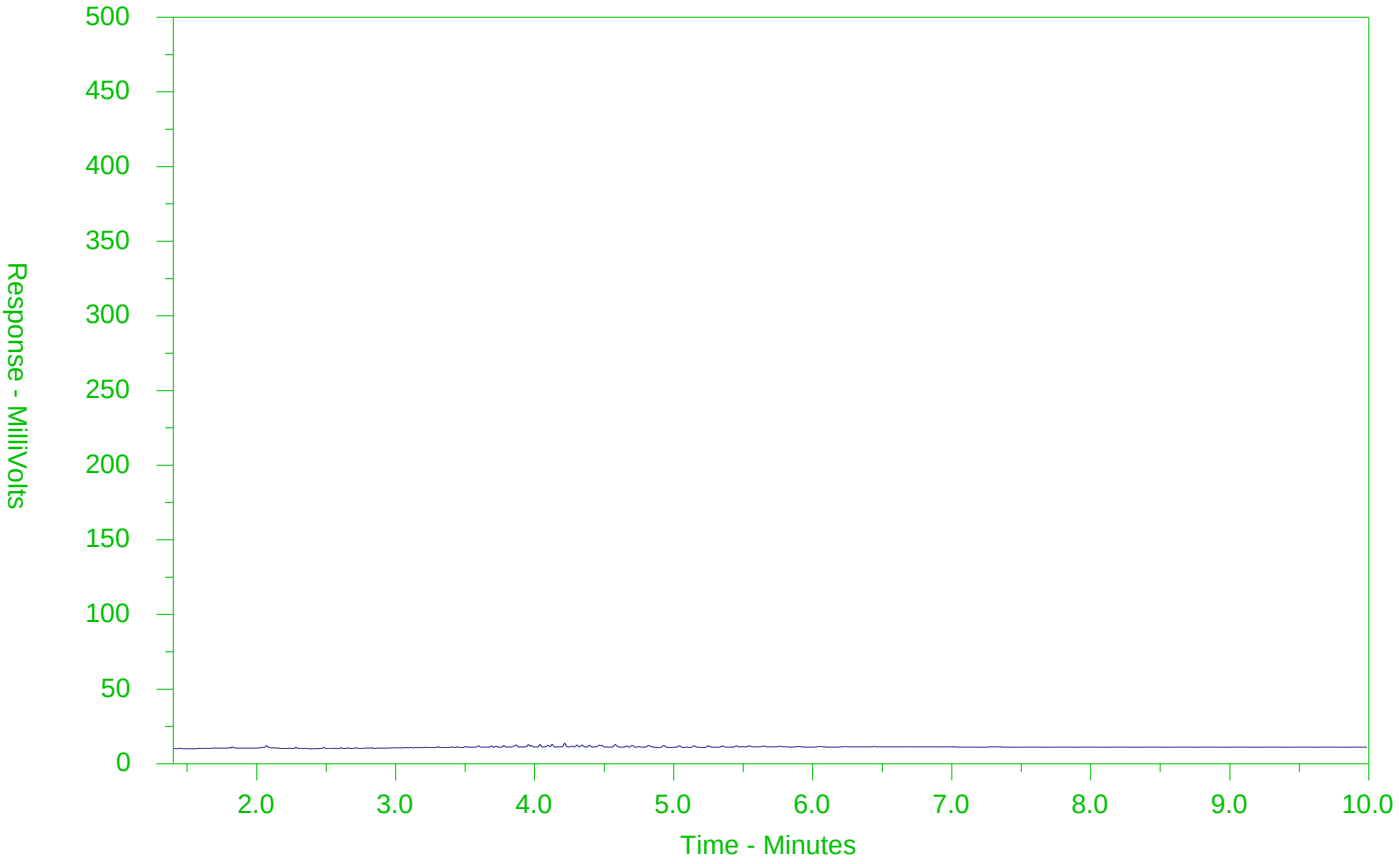
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1874349-2
Client Sample ID: MW16-3



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

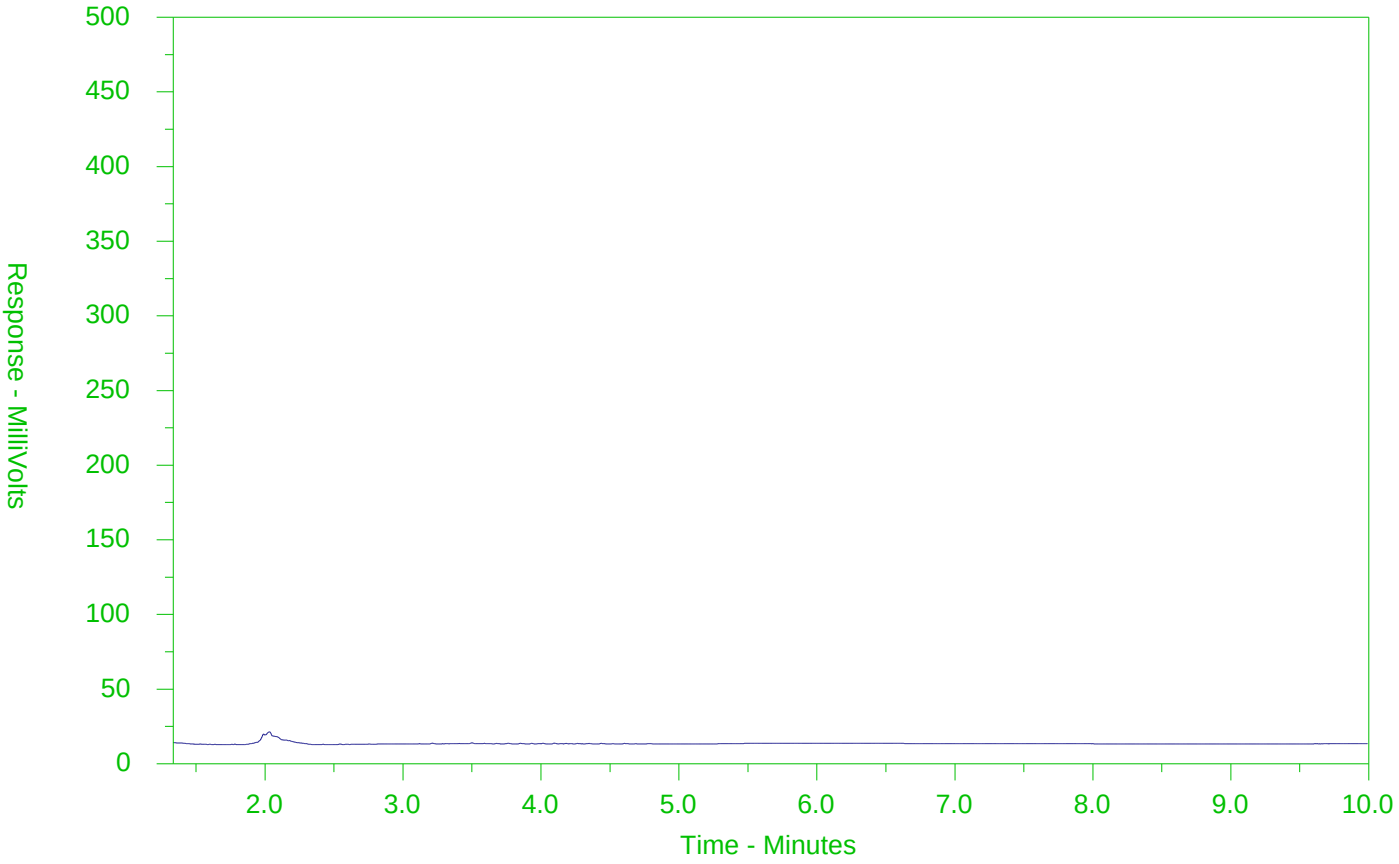
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1874349-3
Client Sample ID: MW16-4



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

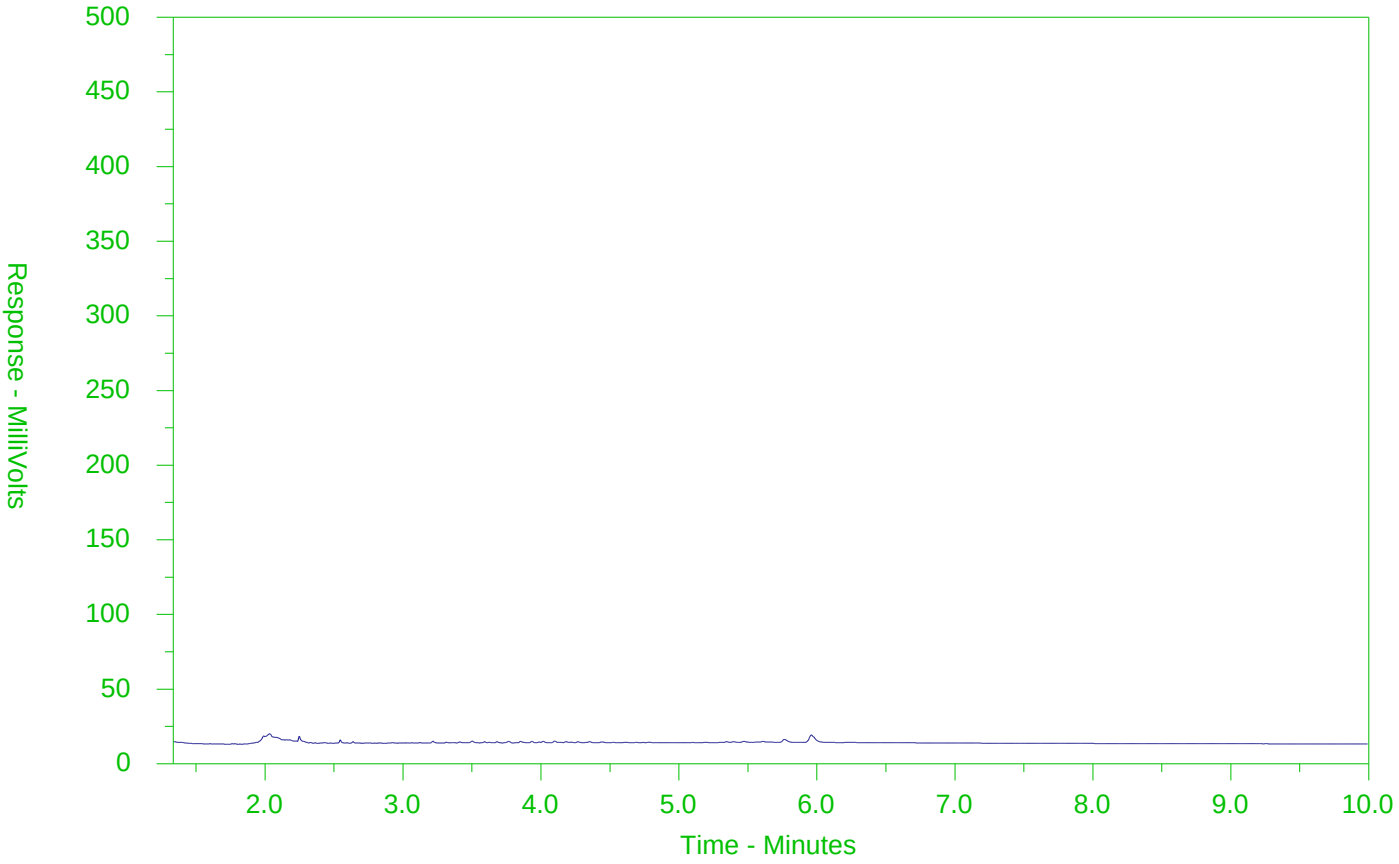
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1874349-4
Client Sample ID: MW16-5



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →	← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

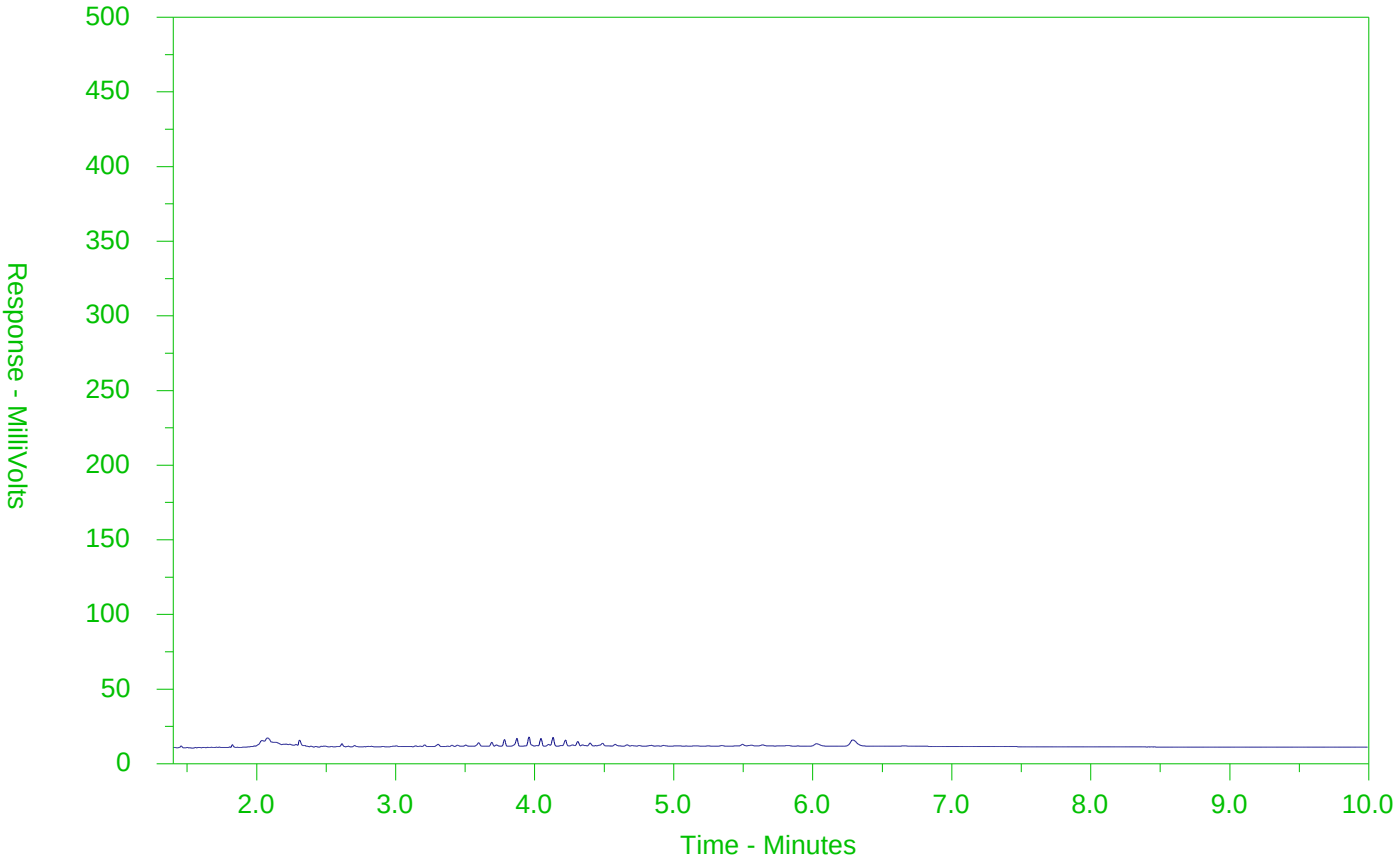
The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT

ALS Sample ID: L1874349-5
Client Sample ID: MW16-105



←F2→	←F3→	←F4→	
nC10	nC16	nC34	nC50
174°C	287°C	481°C	575°C
346°F	549°F	898°F	1067°F
Gasoline →		← Motor Oils/Lube Oils/Grease →	
← Diesel/Jet Fuels →			

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at www.alsglobal.com.

ALS Environmental
www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

L1874349-COFC

COC Number: 14 - 447345

Page 1 of 1

Report To		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)
Company:	WSP Canada Inc.	Select Report Format:	☒ PDF ☒ EXCEL ☐ EDD (DIGITAL)	R ☐ Regular (Standard TAT if received by 3pm)
Contact:	Kathryn Maton	Quality Control (QC) Report with Report	☐ Yes ☐ No	P ☒ Priority (2-4 business days if received by 3pm)
Address:	300-2611 Queensview Drive, Ottawa.	☒ Criteria on Report - provide details below if box checked		E ☐ Emergency (1-2 business days if received by 3pm)
		Select Distribution:	☒ EMAIL ☐ MAIL ☐ FAX	E2 ☐ Same day or weekend emergency if received by 10am – contact ALS for surcharge.
Phone:	613-617-9237.	Email 1 or Fax	Kathryn.Maton@wspgroup.com	Specify Date Required for E2,E or P:
		Email 2		

Invoice To		Invoice Distribution	
Same as Report To	☒ Yes ☐ No	Select Invoice Distribution:	☒ EMAIL ☐ MAIL ☐ FAX
Copy of Invoice with Report	☐ Yes ☐ No	Email 1 or Fax	Kathryn.Maton@wspgroup.com
Company:	WSP	Email 2	
Contact:	Kathryn Maton.		

Project Information		Oil and Gas Required Fields (client use)	
ALS Quote #:		Approver ID:	Cost Center:
Job #:	161-17230-00.	GL Account:	Routing Code:
PO / AFE:		Activity Code:	
LSD:		Location:	
ALS Lab Work Order # (lab use only)	L1874349.	ALS Contact:	Sampler:

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	O.Reg 153 PHC F1-F4 + BTEX	O.Reg 153 Inorganics / Metals	O.Reg 153 VOCs	Number of Containers
1	MW16-2	26/12/16	12pm	GW	X	X	X	
2	MW16-3	↓	11:am	↓	X	X	X	
3	MW16-4		10:am		X	X	X	
4	MW16-5		9am		X	X	X	
5	MW16-105		9am		X	X	X	
6	Trip Blank						X	
7								

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify Criteria to add on report (client Use)
Are samples taken from a Regulated DW System? ☐ Yes ☒ No	Table 2 SCS Residential / Institutional
Are samples for human drinking water use? ☐ Yes ☒ No	

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐		SIF Observations	Yes ☐ No ☐
Ice packs	Yes ☐ No ☐	Custody seal intact	Yes ☐ No ☐
Cooling Initiated ☐			
INITIAL COOLER TEMPERATURES °C	2.6	FINAL COOLER TEMPERATURES °C	3.4°C

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: KMaton	Date: 26/12/16	Time: 1pm.	Received by: Tommy Andrews	Date: Dec 29/16	Time: 9:00	Received by: [illegible]	Date: 29Dec16	Time: 1030

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION — WHITE - LABORATORY COPY — YELLOW - CLIENT COPY

NA-FM-0326e v08 Front/03 October 2013

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

8A