LIMITED PHASE II ENVIRONMENTAL SITE ASSESSMENT
2555 SHEFFIELD ROAD
OTTAWA, ON

DST File No: TS-SO-037029

MAY 23, 2019

Prepared for:
AIM Recycling Ottawa East
A division of American Iron & Metal Company Inc.
2555 Sheffield Road
Ottawa, Ontario
K1B3V6

DST Consulting Engineers Inc.

A division of Englobe
2150 Thurston Drive, Suite 203
Ottawa, Ontario, K1G 5T9
Tel.: 613-748-1415 Fax: 613-748-1356
E-mail: ottawa@dstgroup.com

EXECUTIVE SUMMARY

DST Consulting Engineers Inc. (DST), a division of Englobe, conducted a Limited Phase II ESA at AIM Recycling Ottawa East, located at 2555 Sheffield Road in Ottawa, Ontario (the "Site"), to evaluate if the soil and groundwater quality at the Site has been impacted due to the current Site operations.

Due to the activity on the site since many years a Phase I ESA will have determined that a Phase II ESA is required for this reason a Limited Phase II ESA was conducted at the same time of the geotechnical Investigation.

The field program for the Limited Phase II ESA consisted of the advancement of 15 boreholes. Three boreholes were instrumented with groundwater monitoring wells. The field program for the Limited Phase II ESA and was conducted in conjunction with an ongoing geotechnical investigation. The geotechnical investigation findings are reported under separate cover.

A total of 15 soil samples, one soil sample from each borehole, collected during the investigation were submitted for laboratory analysis of petroleum hydrocarbons PHC(F1–F4), O.Reg.153 metals, volatile organic compounds (VOCs). Three groundwater samples plus a duplicate were submitted for laboratory analysis of PHC(F1–F4), O.Reg.153 metals, VOCs, and Polycyclic Aromatic Hydrocarbons (PAHs).

Soil and groundwater analytical results were compared against applicable provincial standards, as set out in the Ontario Ministry of the Environment Conservation and Parks (MECP) "Soil, Groundwater and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards for soil in a Non-Potable Groundwater Condition. Residential/Parkland/Institutional Property Use for soil, and All Types of Property Use (coarse textured soils).

Based on the laboratory analytical results, nine (9) soil samples and two (2) groundwater samples were in found to exceed the applicable MECC Table 3 standards for the COCs. The boreholes where these soil exceedances were encountered are presented in Figure 2 and the groundwater exceedances are presented in Figure 3.

TABLE OF CONTENTS

APPENDICES

1. INTRODUCTION

1.1 General

DST Consulting Engineers Inc. (DST), a division of Englobe was retained by AIM Recycling Ottawa East, a division of American Iron & Metal Inc., to conduct a Limited Phase II Environmental Site Assessment (ESA) in conjunction with the geotechnical investigation at their recycling facility located at 2555 Sheffield Road in Ottawa, Ontario (herein referred to as the "Site").

Due to the activity on the site since many years a Phase I ESA will have determined that a Phase II ESA is required for this reason a Limited Phase II ESA was conducted at the same time of the geotechnical Investigation.

DST conducted the Limited Phase II ESA in general accordance with Canadian Standards Association (CSA) Standard Z769-00 Phase II Environmental Site Assessment (R2013). The purpose of this assessment was to evaluate if the soil and groundwater quality at the Site has been impacted by the current Site uses.

Authorization to proceed with this work provided by email from Mr. Christian Brisbois of AIM Recycling Ottawa East (herein referred to as the "Client") on Mach 7, 2019 and DST provided Client with a proposal (DST Ref No: TS-S0-037209, dated March 13, 2019).

1.2 Site Description

The Site is located at a municipal address of 2555 Sheffield Road in Ottawa, Ontario. The location of the Site is shown on the Site Location Map attached as Figure 1 in Appendix B.

The Site is an approximately rectangular property in an industrial part of the City. It is currently occupied by a metals recycling facility. There are two existing buildings on the Site. One is located on the south-west and the second on the north-west corners of the Site. The existing building at the south-west corner of the Site is a two-storey and one-story slab on grade structure mainly used as indoor recycling warehouse and offices. The existing building at the north-west corner of the Site is a one-story slab on grade structure mainly used as a garage and mechanical warehouse. The east side of the Site has an existing on-grade concrete pavement structure and is used as an outdoor recycling yard. The balance of the Site has gravel as surficial cover and is mainly used for storage and traffic circulation purpose.

DST's understanding of the Site and the proposed new development are based on the preliminary architectural drawings "Recycling Ontario Sheffield Road Layout Development" (Ref No: AIM-ONT-Sheffield-Lay, dated December 5, 2018) prepared Novatech Architects. The proposed new development is understood to include demolition of two existing buildings and the construction of two new buildings, two new truck scales, a new parking lot and a new pavement structure for the outdoor recycling yard.

1.3 Scope of Work

DST's scope work to complete a Limited Phase II ESA for this Site was performed at the same time as the geotechnical investigation. DST's scope of work is summarized as follows:

- Supervised the fieldwork and logged the soil conditions in the boreholes, based on the samples that were recovered. All soil samples were field-screened using visual and olfactory observations, as well as the use of headspace testing for organic vapours;
- Installed three (3) monitoring wells;
- Purged and developed the three (3) monitoring wells;
- Submitted the soil and groundwater samples to the environmental laboratory for the following testing:
    - Bulk testing on 15 soil samples for PHC(F1-F4), O.Reg 153 Metals, and VOCs,
    - Analytical testing on three (3) groundwater samples for PHC(F1-F4), O. Reg 153 Metals, VOCs, and PAHs, and
    - One soil sample for analysis using the Toxicity Characteristic Leaching Procedure (TCLP) procedure;
- Compared the laboratory analytical results for the submitted soil and groundwater samples to the applicable Ontario Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated July 1, 2011; and
- Completed this Limited Phase II ESA report based on the findings of the laboratory testing.

2. BACKGROUND INFORMATION

As the study Site is a metal recycling facility and that just the current uses would have triggered a Phase II ESA, it was decided by the Client to proceed directly with the Phase II ESA in conjunction with the geotechnical investigation. The intent was to field screen all samples recovered during the geotechnical investigation and submit representative samples to the laboratory to assist the Client in assessing how to manage excess soils generated as part of the upcoming development.

The Site is located in an industrial park and its current use is as a metals recycling facility. DST has also performed a historical Limited Phase II ESA of the adjacent Site for the same Client (DST Ref No: OE-OT-01857, dated July 2012). Based on the current Site use, the surrounding properties and the results of the previous investigation PHC(F1-F4), O.Reg 153 metals, and VOCs were identified as the Contaminants of Concern (COCs) for soil in this assessment. In addition, PAH was added as a COC for water based on the water results of the previous investigation.

3. ENVIRONMENTAL QUALITY GUIDELINES

Based on Site conditions, the following Site Conditions Standards were considered applicable to the Site:

SOILS:

MECP "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition. Industrial/Commercial/Community Property Use, Coarse Textured Soils.

GROUNDWATER:

MECP "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition. All Types of Property Use, Coarse Textured Soils.

MANAGEMENT OF EXCESS SOILS:

MECP "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 1: Background, Coarse Textured Soils.

MECP "General – Waste Management of soil and groundwater under Part XV.1 of the Environmental Protection Act ", October 2000: Schedule 4 to the Regulation, including the Leachate Extraction Procedure. Under O. Reg. 558/00.

The rationale for the selection of the above-referenced Site Condition Standards is as follows:

- The Site and surrounding properties are supplied with potable water through the City of Ottawa's municipal drinking water system;
- The northern and southern portions of the Site are occupied by other industrial buildings uses. Therefore, the most stringent property use that is applicable to the Site is Industrial/Commercial/Community Property Use;
- A coarse grained soil texture was selected for comparison of analytical data to applicable provincial standards as this represents the 'worst-case' scenario;

- The Site is not considered a “shallow soil property” as defined by O. Reg. 153/04 (as amended); and,
- The Site is not located within 30 metres of a surface water body

4. FIELD PROGRAM AND METHODOLOGY

4.1 Borehole Drilling

The drilling program took place between March 18th and 21st, 2019, and consisted of the advancement of 15 boreholes (BH19-1 to BH19-15) of which three of the boreholes were instrumented with groundwater monitoring wells. Since the Limited Phase II ESA and geotechnical investigation were conducted simultaneously, boreholes were advanced to various depths ranging from approximately 1.5 meter below ground surface (mbgs) to approximately 13.2 mbgs, into the bedrock. A total of 15 soil samples, one from each borehole, were submitted as part of this Limited Phase II ESA.

George Downing Estate Drilling Ltd. was retained to perform the drilling. All boreholes were drilled using a truck mounted CME-55 drill rig, under the supervision of DST field personnel.

The location of the boreholes is shown on the Borehole Location Plan attached as Figure 2 at the end of this report. The location and elevation of the boreholes was surveyed by Annis O'Sullivan Vollebekk Ltd retained by Client.

4.2 Soil Sampling

Overburden soil was drilled using hollow-stem continuous-flight augers. Soil samples from overburden were collected using a 50 mm diameter split-spoon sampler driven by an automatic Standard Penetration Test (SPT) hammer.

Representative soil samples were collected in intervals of approximately 0.75 m where possible. Field-screened soil samples were placed directly into laboratory sample jars and vials supplied by Parcel Laboratories Ltd. Samples to be submitted for laboratory analysis of non-volatile compounds PHC(F2–F4) and Metals were placed in unpreserved clear glass jars with Teflon lids, while samples to be submitted to the laboratory for analysis of volatile compounds PHC(F1) BTEX, and VOCs were collected using disposable soil plug sample collectors supplied by the laboratory. The soil plugs were placed in laboratory-supplied vials charged with measured volumes of methanol for sample preservation.

Soil samples were logged in the field for texture, odour, moisture and visual appearance (staining). The borehole logs are provided in Appendix C.

4.3 Field Screening Methods

Where sample recovery was sufficient, a portion of each collected soil sample was placed in a polyethylene bag and was allowed to equilibrate in a warm environment prior to being screened for combustible vapour concentrations (CVCs). Combustible vapour concentrations of soil samples were measured using an RKI Eagle™ portable vapour meter equipped with a catalytic combustible gas detector (CCGD), with a detection limit of 500 parts per million (ppm). The vapour meter was operated in methane elimination mode and was calibrated by DST field personnel prior to use.

Based on visual and olfactory observations, CVC measurements, and the position of the collected soil samples with respect to the inferred groundwater table, soil samples were selected from each borehole, to be submitted for laboratory analysis of the COCs. Combustible vapour concentrations of the collected soil samples, as measured by the vapour meter, are provided in the borehole logs in Appendix C. Soil sample locations and analysis are presented in Table 4-1.

Table 4-1: Soil Sample Locations and Analysis

Sampling Date (d/m/y)	Sample ID/Location	Sample Depth (mbgs)	Analysis Performed
19-Mar-19	BH19-1 SS#5	3.8 - 4.4 Fill	PHC (F1–F4), Metals, VOCs
19-Mar-19	BH19-2 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
19-Mar-19	BH19-3 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-4 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
20-Mar-19	BH19-5 SS#1	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
19-Mar-19	BH19-6 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-7 SS#4	2.3 - 2.9 Fill	PHC (F1–F4), Metals, VOCs
18-Mar-19	BH19-8 SS#4	2.3 - 2.9 Fill	PHC (F1–F4), Metals, VOCs
18-Mar-19	BH19-9 SS#4	2.3 - 2.9 Fill	PHC (F1–F4), Metals, VOCs
18-Mar-19	BH19-10 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
20-Mar-19	BH19-11B SS#3	1.5 - 2.1 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-12 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-13 SS#2	0.8 - 1.4 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-14 GS#1	0.2 - 0.6 Fill	PHC (F1–F4), Metals, VOCs
21-Mar-19	BH19-15 GS#1	0.2 - 0.6 Fill	PHC (F1–F4), Metals, VOCs

4.4 Monitoring Well Installation

Monitoring wells were installed in three (3) of the advanced boreholes, MW19-4, MW19-6 and MW19-9 using the same drilling equipment described in Section 4.1. The monitoring wells were comprised of a 50 mm diameter polyvinyl chloride (PVC) pipe and a #10 slotted PVC well screen placed to intercept the inferred groundwater table. A sand-pack consisting of clean silica sand was placed within the annular space surrounding the screened section of the wells, and bentonite chips were added from the top of the sand layer to within 0.3 m of the surface to minimize the potential for cross-contamination. A PVC cap was placed at the top of each well pipe and a protective flush-mount steel casing was cemented at surface to protect each well. Refer to the borehole logs in Appendix C for the monitoring well installation details.

Following monitoring well installation activities, the wells were equipped with dedicated Waterra™ tubing (approximately 1.25 cm in diameter) and inertial lift foot valves for well development purposes. The monitoring wells were developed to remove any groundwater impacted by drilling activities and to reduce the amount of sediment within the wells.

4.5 Groundwater Level Measurements

DST field personnel collected groundwater level measurements from the installed monitoring wells prior to groundwater sampling activities. The water levels were measured using a Solinst Canada Ltd. Model 122 oil/water interface meter which is also used to confirm the presence/absence and thickness of free (petroleum) product that may potentially be residing on the surface of the groundwater table. The electronic interface probe was decontaminated prior to the collection of each water level measurement.

4.6 Groundwater Sampling

In order to remove any stagnant groundwater prior to sampling, each monitoring well was purged of approximately three well volumes of groundwater, using dedicated Waterra™ tubing and inertial lift foot valves.

Groundwater samples were collected from monitoring wells on March 29th, 2019, using the dedicated Waterra™ tubing and inertial lift foot valves in each of the wells. The groundwater samples from the three monitoring wells were collected directly into laboratory-supplied containers, for laboratory analysis of COCs. Groundwater sample locations and analyses are presented in Table 4-2.

Table 4-2: Groundwater Sample Locations and Analysis

Sampling Date (dd/mm/y)	Sample ID/Location	Laboratory Analysis
19-Mar-29	MW19-4	PHC (F1 – F4), Metals, VOCs, PAHs
19-Mar-29	MW19-6	PHC (F1 – F4), Metals, VOCs, PAHs
19-Mar-29	MW19-9	PHC (F1 – F4), Metals, VOCs, PAHs

4.7 Analytical Testing

Soil and groundwater samples were submitted to Paracel Laboratories Ltd. (Paracel), of Ottawa, Ontario, for chemical analysis which is certified by Canadian Association for Laboratory Accreditation Inc. (CALA).

4.8 Quality Assurance / Quality Control (QA/QC)

DST maintains a standard Quality Assurance / Quality Control (QA/QC) program for environmental assessments. The field sampling and QA/QC program was completed in accordance with the applicable Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario (MECP, 1996). All project documentation was maintained and controlled by the appointed field supervisor. All borehole advancement and soil and groundwater sampling was completed in accordance with industry standards, and applicable provincial standards/guidelines.

Collected soil and groundwater samples during the investigation were placed in ice-packed coolers. Samples were shipped under a chain of custody protocol to a certified laboratory for chemical analyses.

The potential for cross-contamination between samples was minimized by, where applicable, washing sampling tools with phosphorous-free soap and water, followed by rinsing with distilled water, and by wearing new disposable nitrile gloves prior to the handling of each sample.

5. RESULTS AND EVALUATION

5.1 Stratigraphy

Based on the soil data collected, the general soil stratigraphy for the Site is characterized by a layer of fill underlain by a native silty clay and till to the extent of the advanced boreholes.

A detailed description of the soil stratigraphy in each borehole is provided in the borehole logs in Appendix C.

5.2 Field Observations

There was visual and olfactory evidence of petroleum noted the collected sample of fill soil retrieved from borehole MW19-4, MW19-6, BH19-7, BH19-8, MW19-9, BH19-10B, BH19-11B, BH19-12 and BH19-13.

No sheen, free phase liquid petroleum hydrocarbons, or odours were noted during the subsequent groundwater sampling activities.

5.3 Groundwater Elevations

Static groundwater level measurements were collected prior to groundwater purging and sampling activities, on March 29, 2019. The groundwater elevations in each monitoring well were calculated by subtracting the static water level depth from the elevation of the ground surface adjacent to each well.

Monitoring wells were installed in MW19-4, MW19-6 and MW19-9. DST returned to the Site on March 29, 2019 to measure the water level and obtained water sample from each monitoring well. Monitoring well and groundwater elevation data is presented in Table 5-1.

Table 5-1: Monitoring Well and Groundwater Elevations

Monitoring Well	Groundwater Depth (mbgs)	Groundwater Elevation (masl)
MW19-4	3.6	63.5
MW19-6	2.3	64.7
MW19-9	2.3	65.0

Note: groundwater elevations are subject to seasonal fluctuations.

5.4 Soil Texture

DST conducted geotechnical laboratory testing on selected soil samples which are presented in geotechnical investigation report in a separate cover. Overburden soils collected during the investigation consisted mainly of granular fill soils underlain by a native silty clay and till. The bedrock was encountered from approximately 9.0 mbgs to 10.2 mbgs. As noted in Section 3, a coarse-grained soil texture was selected for comparison of analytical data to applicable provincial standards as this represents the 'worst-case' scenario.

5.5 Soil Quality compared to MECP Table 3

Analytical results of the soil samples submitted for laboratory analyses were compared against the applicable MECP Table 3 standards for Industrial/Commercial/Community Property Use. Based on the laboratory analytical results nine (9) soil samples, MW19-6, BH19-7, MW19-9, BH19-10B, BH19-11B, BH19-12, BH19-13 BH19-14 and BH19-15, exceeded the applicable MECP Table 3 standards for PHC(F1-F4) and/or Metals.

5.6 Soil Quality compared to MECP Table 1

Analytical results of the soil samples submitted for laboratory analyses were further compared against the applicable MECP Table 1 standards for Industrial/Commercial/Community Property Use. Based on the laboratory analytical results 13 soil samples, BH19-2, BH19-3, MW19-4, MW19-6, BH19-7, BH19-8, MW19-9, BH19-10B, BH19-11B, BH19-12, BH19-13, BH19-14, and BH19-15, exceeded the applicable MECP Table 1 standards for a combination of PHC(F1-F4), Metals, and/or VOCs.

Refer to Tables D-1, D-2 and D-3, in Appendix D, for the soil analytical results. The laboratory certificates of analysis are provided in Appendix E.

5.7 Groundwater Quality

Analytical results of the groundwater samples submitted for laboratory analysis were compared against the applicable MOECC Table 3 standards for All Types of Property Use. Based on the laboratory analytical results, two (2) groundwater samples from MW19-4 and MW19-9 exceeded the applicable MOECC Table 3 standards for the COCs.

Refer to Tables D-4 and D-6, in Appendix D, for the groundwater analytical results. The laboratory certificates of analysis are provided in Appendix E.

5.8 Leachate Quality

Analytical results of the soil samples submitted for laboratory Toxicity Characteristic Leaching Procedure (TCLP) testing analyses were compared against the applicable MECP. O. Reg. 588/00 Schedule 4 for excess soil management. Based on the laboratory analytical results the combined TCLP sample from boreholes BH19-12 and BH19-13, was in compliance with the applicable Schedule 4 of the regulation, and thus are considered as non-hazardous waste.

5.9 QA/QC Results

The field program included the submission of one soil sample from every borehole and one field duplicate groundwater sample for laboratory analysis of PHC (F1 – F4), Metals and VOCs.

- Duplicate of groundwater sample was selected from MW19-9 monitoring well.

The analytical results of an original (parent) sample and its corresponding field duplicate are generally quantitatively comparable. Relative percent differences (RPDs) between analytical results from parent and field duplicate samples are calculated using the following formula:

$$RPD = \frac{(\text{Sample Result} - \text{Duplicate Result}) \times 100}{(\text{Sample Result} + \text{Duplicate Result}) / 2}$$

Relative percent differences are only calculated for a parameter when both sample concentrations (the original and the duplicate) are greater than five times the laboratory reportable detection limit (RDL). The average calculated RPDs was approximately 40% based on the analytical results of the collected groundwater duplicates for Metals and 9% for VOCs.

No quality control issues that would affect the reliability of the analytical results were identified by the laboratory. Therefore, based on this information, the analytical results are considered reproducible. Laboratory quality control data is included within the laboratory certificates of analysis in Appendix E. Laboratory quality control data is included with the laboratory certificates of analysis in Appendix E.

6. CONCLUSIONS AND RECOMMENDATIONS

DST has conducted a Limited Phase II ESA at AIM Recycling Ottawa East, located at 2555 Sheffield Road in Ottawa, Ontario, to evaluate if the soil and groundwater quality at the Site has been impacted by the current Site use.

The field program for the Limited Phase II ESA consisted of the advancement of 15 boreholes and three groundwater monitoring wells. 15 soil samples PHC(F1–F4), Metals and VOCs. Three groundwater samples collected during the investigation were submitted for PHC(F1–F4), Metals VOCs and PAHs.

The fill soils encountered in MW19-6, BH19-7, MW19-9, BH19-10B, BH19-11B, BH19-12, BH19-13 BH19-14 and BH19-15 were found to have Table 3 exceedances. Fill soils in the vicinity of these boreholes will need to be removed from Site as part of the upcoming construction. They will need to be disposed of at a licensed waste disposal facility.

The fill soils encountered in all boreholes except borehole BH19-2 and BH19-5 were found to have Table 1 exceedances. Soils which exceed Table 1 yet meet Table 3 may be re-used elsewhere on Site. If soils in the vicinity of these boreholes become excess and need to be removed from Site, then they will need to be disposed of at a licensed waste disposal facility.

The submitted TCLP soil sample from BH19-12 GS#1 and BH19-13 GS#1 meets the O. Reg 558/00 schedule 4 criteria. Therefore, the excess soils that need to be removed from Site and moved to a designated licensed landfill would be considered as non-hazardous solid waste as per the definition in O.Reg. 558/00.

The Contractor and a Qualified Person should prepare a Soil Management Plan (SMP) at the outset of construction to discuss the handling of excess soils that are generated during the upcoming Site development.

As part of construction there will be excavation for the new garage building, the new parking area, and the two new truck scales. These are locations which have Table 3 Exceedances of the fill soils. For the new garage it is expected that excavations will be approximately 3.0 m deep, in order to reach native soil. For the new parking area it is expected that the excavation will be approximately 0.7 m deep to accommodate the new pavement structure. For the new truck scales it is expected that the excavations will be approximately 2.5 m deep to reach native soils. Based on these anticipated excavation depths and the building footprints provided by the Client,

approximately 3,750 m^3 of soils exceeding Table 3 will need to be removed from Site during construction of these structures.

As part of construction there will also be excavation for the new warehouse building. This location has Table 1 Exceedances of the fill soils. For the new warehouse building it is expected that excavations will be approximately 3.0 m deep, in order to reach native soil. Based on this anticipated excavation depths and the building footprints provided by the Client, approximately 11,150 m^3 of soils exceeding Table 1 will need to be removed from Site during construction.

It is important to note that the approximated volumes above includes the excavation of the perimeter footings only. It does not include for removal of the existing buildings, future civil services, delineation of impacted soils to find the limits, or clean up of the Site. It is understood that the Client is not currently intending to clean up the Site, and the estimates provided are to assess the removal of excess soils generated during construction only.

Based on the findings of this Limited Phase II ESA additional delineation testing of the soil for the Site may be warranted in order to attempt to minimize soil disposal costs for this Project.

7. CLOSURE

This report was prepared for the exclusive use of the AIM Recycling Ottawa East. Any use of this report by any third party, or any reliance on or decisions to be made based on it, are the responsibility of such parties. DST accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust the information herein meets your expectations. Should you have any questions, please do not hesitate to contact the undersigned at your convenience.

Yours truly,

DST Consulting Engineers Inc.

Shane Dunstan, P. Eng.
Geotechnical Project Manager

Eric Domingue, P.Eng., M.A.Sc.
Director of Technical Services

8. REFERENCES

1. DST Consulting Engineers Inc., "Limited Phase II Environmental Site Assessment, 2575/2585 Sheffield Road, Ottawa, Ontario". July 2012. DST File No: OE-OT-014857.

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

3. Ontario Ministry of the Environment, 2011. *Soil, Ground Water and Sediment Standards for Use Under Part XV.I of the Environmental Protection Act*.

4. Ontario Ministry of the Environment, as amended January 2014. *Ontario Resources Act R.R.O. 1990, Regulation 903 – Wells.*

APPENDIX A
Limitations of Report

Limitations of Report

The information, conclusions and recommendations given herein are specifically for this project and this Client only, and for the scope of work described herein. It may not be sufficient for other uses. DST does not accept responsibility for use by third parties.

The data, conclusions and recommendations which are presented in this report, and the quality thereof, are based on a scope of work authorized by the Client. Note, however, that no scope of work, no matter how exhaustive, can identify all contaminants or all conditions above and below ground. For example, conditions between test holes may differ from those encountered in the investigation and observed or measured conditions may change with time. This report therefore cannot warranty that all conditions on or off the site are represented by those identified at specific locations.

Any recommendations and conclusions provided that are based on conditions or assumptions reported herein will inherently include any uncertainty associated with those conditions or assumptions. In fact, many aspects involving professional judgement such as subsurface models and remediation criteria contain a degree of uncertainty which cannot be eliminated. This uncertainty should be managed by periodic review and refinement as additional information becomes available.

Note also that standards, guidelines and practices related to environmental investigations may change with time. Those which were applied at the time of this investigation may be obsolete or unacceptable at a later date. Any topographic benchmarks and elevations documented in this report are primarily to establish relative elevation differences between test locations and should not be used for other purposes such as grading, excavation, planning, development, etc.

Any comments given in this report on potential remediation problems and possible methods are intended only for the guidance of the designer. The scope of work may not be sufficient to determine all of the factors that may affect construction or clean-up methods and costs. Contractors bidding on this project or undertaking clean-ups should, therefore, make their own interpretation of the factual information presented and draw their own conclusions as to how the conditions may affect their work. Any results from an analytical laboratory, title searcher or other subcontractor reported herein have been carried out by others, and DST Consulting Engineers Inc. cannot warranty their accuracy. Similarly, DST cannot warranty the accuracy of information supplied by the Client.

APPENDIX B

Site and Borehole Location Plans

1:15 000

0 250 500 750 m

0 1:1 5 cm

Scale accurate when printed at 100% using paper size ANSI full bleed A (8.5 x 11.0 Inches)

Revision	Date	Issue	Approval
0	04/18/19	Original	

Client: AIM Recycling Ottawa East

Site: 2555 Sheffield Road, Ottawa, ON

DST consulting engineers a division of Englobe

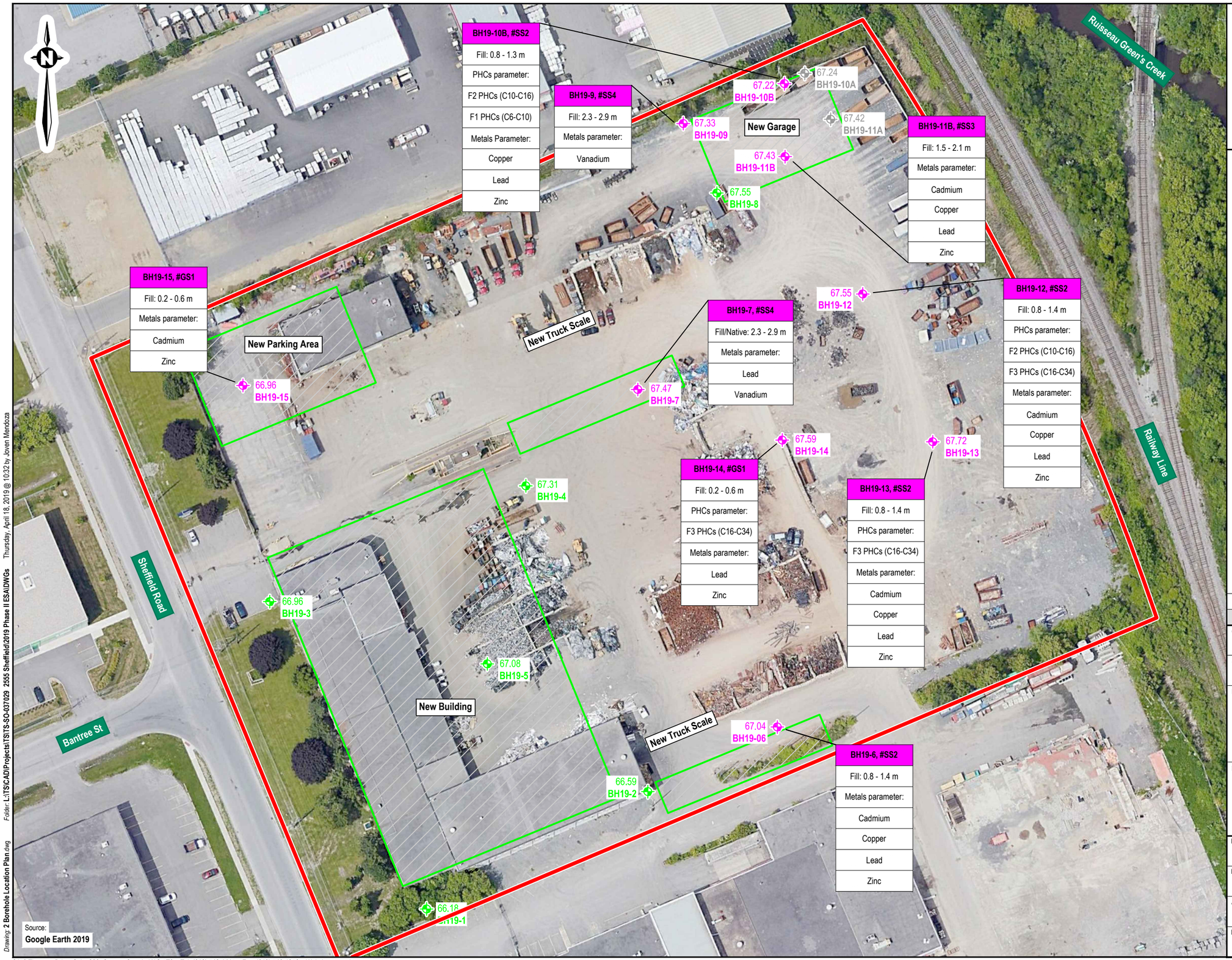
Report Title: Phase II Environmental Site Assessment

Drawing Title: Site Location Plan

Designed By	Date
S.N.	April 2019
Drawn By	Project No.
J.M.	TS-SO-37029
Approved By	Figure No.
S.D.	1
Scale	
As shown	

2150 Thurston Drive, Suite 203, Ottawa, Ontario K1G 5T9 Tel: (613) 748-1415 Fax: (613) 748-1356 Website: www.dstgroup.com

Folder: L:\TS\CAD\Projects\TS\TS-SO-037029 2555 Sheffield\2019 Phase II ESA\DWGs Tuesday, April 16, 2019 @ 13:04 by Joven Mendoza
Drawing: 1 Site Location Plan.dwg



Drawing: 2 Borehole Location Plan.dwg Folder: L:\TS\CAD\Projects\TS\TS-SO-037029 2555 Sheffield\2019 Phase II ESA\DWGs Thursday, April 18, 2019 @ 10:32 by Joven Mendoza

DST consulting engineers a division of Englobe

Note

1. This drawing shall be read in conjunction with the associated technical report.

Legend

- Site Boundary
- Soil Sample Location Exceeds MECP Table 3 Standards
- Soil Sample Location Meets MECP Table 3 Standards
- Soil Sample Not Tested
- Proposed Building Locations

1:1 000

0 10 20 30 40 50 m

0 1:1 5 cm

Scale accurate when printed at 100% using paper size ANSI full bleed B (11.0 x 17.0 Inches)

Revision	Date	Issue	Approval
0	04/18/19	Original	

Client: AIM Recycling Ottawa East

Site: 2555 Sheffield Road, Ottawa, ON

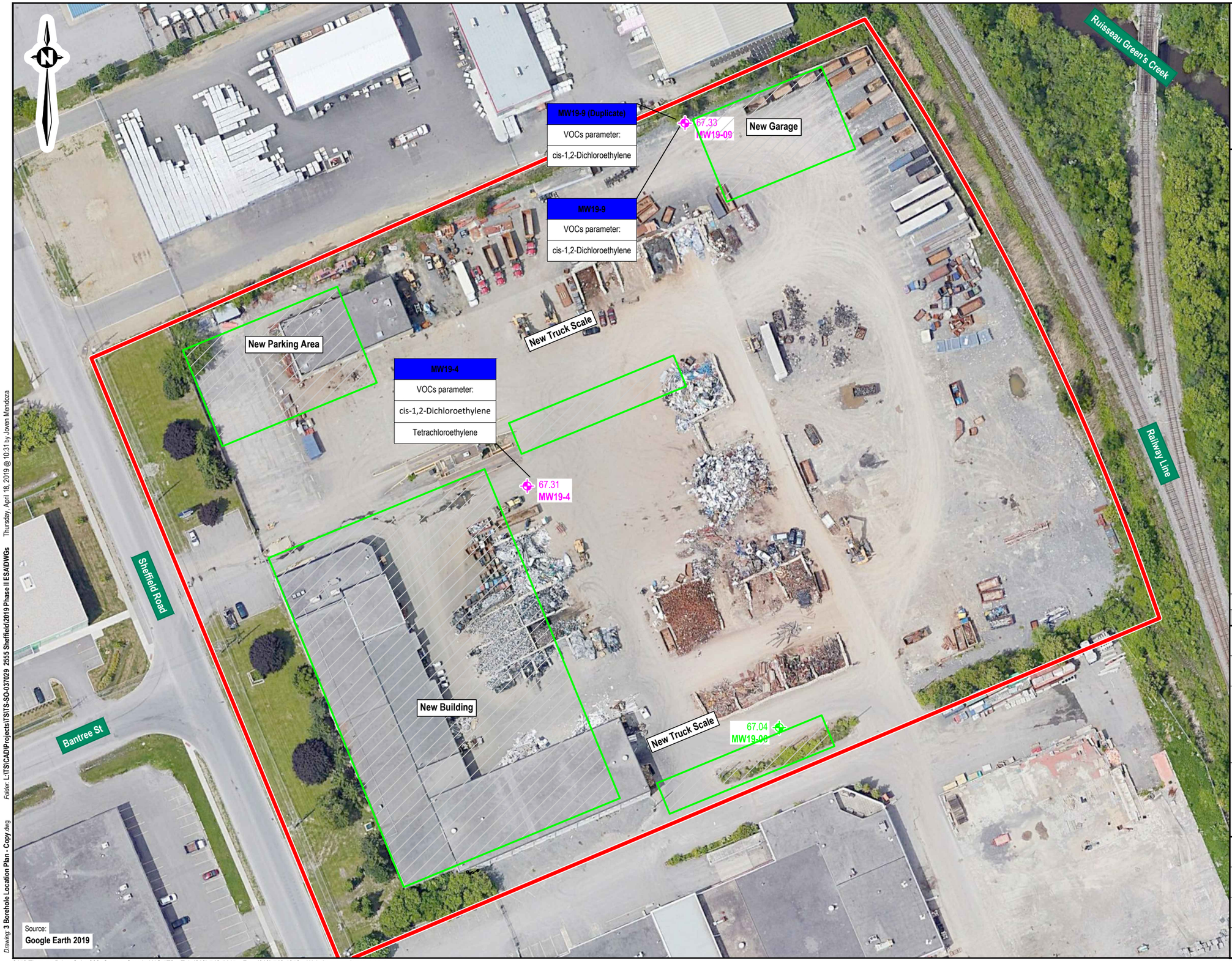
Report Title: Phase II Environmental Site Assessment

Drawing Title: Borehole Location Plan and Soil Sample Exceedances

Designed By	Scale
S.N.	As shown
Drawn By	**Date**
J.M.	April 2019
Approved By	**Project No.**
S.D.	TS-SO-37029

Figure No. 2

2150 Thurston Drive, Suite 203, Ottawa, Ontario K1G 5T9 Tel: (613) 748-1415 Fax: (613) 748-1356 Website: www.dstgroup.com



Drawing: 3 Borehole Location Plan - Copy.dwg Folder: L:\TS\CAD\Projects\TS\TS-SO-037029 2555 Sheffield\2019 Phase II ESA\DWGs Thursday, April 18, 2019 @ 10:31 by Joven Mendoza

consulting engineers
a division of Englobe

Note

1. This drawing shall be read in conjunction with the associated technical report.

Legend

- Site Boundary
- Groundwater Sample Location Exceeds MECP Table 3 Standards
- Groundwater Sample Location Meets MECP Table 3 Standards

1:1 000

0 10 20 30 40 50 m

0 1:1 5 cm

Scale accurate when printed at 100% using paper size ANSI full bleed B (11.0 x 17.0 Inches)

Revision	Date	Issue	Approval
0	04/18/19	Original	

Client
AIM Recycling Ottawa East

Site
2555 Sheffield Road, Ottawa, ON

Report Title
Phase II Environmental Site Assessment

Drawing Title
Groundwater Well Exceedances

Designed By: S.N.	Scale: As shown
Drawn By: J.M.	Date: April 2019
Approved By: S.D.	Project No.: TS-SO-37029

Figure No. **3**

2150 Thurston Drive, Suite 203, Ottawa, Ontario K1G 5T9 Tel: (613) 748-1415 Fax: (613) 748-1356 Website: www.dstgroup.com

APPENDIX C

List of Symbols and Definition for Geotechnical Soil Sampling Borehole Logs

LIST OF SYMBOLS AND DEFINITIONS FOR GEOTECHNICAL SAMPLING AND COMMON LITHOLOGIES

The following is a reference sheet for commonly used symbols and definitions within this report and in any figures or appendices, including borehole logs and test results. Symbols and definitions conform to the standard proposed by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE) wherever possible. Discrepancies may exist when comparing to third-party results using the Unified Soil Classification System (USCS).

PART A – SOILS

Standard Penetration Test (SPT) 'N'

The number of blows required to drive a 50-mm (2 in) split barrel sampler 300 mm (12 in). The standard hammer has a mass of 63.5 kg (140 lbs) and is dropped vertically from a height of 760 mm (30 in). Additional information can be found in ASTM D1586-11 and in §4.5.2 of the CFEM 4th Ed.

For penetration less than 300 mm, 'N' is recorded with the penetration that was achieved.

Non-Cohesive Soils

The relative density of non-cohesive soils relates empirically to SPT 'N' as follows:

Relative Density	'N'
Very Loose	0 – 4
Loose	4 – 10
Compact	10 – 30
Dense	30 – 50
Very Dense	> 50

Cohesive Soils

The consistency and undrained shear strength of cohesive soils relates empirically to SPT 'N' as follows:

Consistency	Undrained Shear Strength (kPa)	'N'
Very Soft	< 12	0 – 2
Soft	12 – 25	2 – 4
Firm	25 – 50	4 – 8
Stiff	50 – 100	8 – 15
Very Stiff	100 – 200	15 – 30
Hard	> 200	> 30

PART B – ROCK

The following parameters are used to describe core recovery and to infer the quality of a rockmass.

Total Core Recovery, TCR (%)

The total length of solid drill core recovered, regardless of the quality or length of the pieces, taken as a percentage of the length of the core run.

Solid Core Recovery, SCR (%)

The total length of solid, full-diameter drill core recovered, taken as a percentage of the length of the core run.

Rock Quality Designation, RQD (%)

The sum of the lengths of solid drill core greater than 100 mm long, taken as a percentage of the length of the core run. RQD is commonly used to infer the quality of the rockmass, as follows:

Rockmass Quality	RQD (%)
Very Poor	< 25
Poor	25 – 50
Fair	50 – 75
Good	75 – 90
Excellent	> 90

Weathering

The terminology used to describe the degree of weathering for recovered rock core is defined as follows, as suggested by the *Geological Society of London*:

Completely weathered: All rock material is decomposed and/or disintegrated to soil. The original mass structure is largely intact.

Highly weathered: More than half the rock material is decomposed and/or disintegrated to soil. Fresh or discolored rock is present either as a discontinuous framework or as core stone.

Moderately weathered: Less than half the rock material is decomposed and/or disintegrates to soil. Fresh or discolored rock is present ether as a continuous framework or as core stone.

Slightly weathered: Discoloration indicates weathering of rock material and discontinuity of surfaces. All the rock material may be discolored by weathering and may be somewhat weaker than its fresh condition.

Fresh: No visible signs of weathering.

PART C – SAMPLING SYMBOLS

Symbol	Description
SS	Split spoon sample
TW	Thin-walled (Shelby Tube) sample
PH	Sampler advanced by hydraulic pressure
WH	Sampler advanced by static weight
SC	Soil core

PART D – IN-SITU AND LAB TESTING

SOIL NAMING CONVENTIONS

Particle sizes are described as follows:

Particle Size Descriptor		Size (mm)
Boulder		> 300
Cobble		75 – 300
Gravel	Coarse	19 – 75
	Fine	4.75 – 19
Sand	Coarse	2.0 – 4.75
	Medium	0.425 – 2.0
	Fine	0.075 – 0425
Silt		0.002 – 0.075
Clay		< 0.002

The principle constituent of a soil is written in uppercase. The minor constituents of a soil are written according to the following convention:

Descriptive Term	Proportion of Soil (%)
Trace	1 – 10
Some	10 – 20
(ey) or (y)	20 – 35
And	35 – 50

Eg.: A soil comprising 65% Silt, 21% Sand and 14% Clay would be described as a: Sandy SILT, Some Clay

LOG OF BOREHOLE BH19-01

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 66.20 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 19, 2019
COORDINATES: 5029984m N, 374710m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	66.20				ASPHALT - Approximately 40 mm thick					
0.1	66.10				FILL - Silty Sand and Gravel (frozen), brown, moist	GS1				
1.0	65				SILTY CLAY - very stiff, grey-brown, moist	SS2		8		PP = 145 kPa
2.0	64					SS3		5		PP = 98 kPa
2.6	63.60				becoming stiff and grey	SS4		6		PP = 50 kPa
3.0	63					FV1			✖	FV1 = 76 kPa, St = 4
3.4	62.80					FV2			✖	FV2 = 76 kPa, St = 4
4.0	62				SILTY SAND (Till) - some Clay, some Gravel, loose, brown, wet	SS5		6		
4.8	61.40					SS6		5		
5.6	60.60					SS7		8		
6.0	60				becoming very dense and gravelly	SS8		53		
7.8	58.40				becoming dense	SS9		35		
8.2	58				End of borehole at approximately 8.2 m in Till.					
9.0	57									
10.0	56									
11.0	55									
12.0	54									
13.0	53									
14.0	52									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 1

LOG OF BOREHOLE BH19-02

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 66.60 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 19, 2019
COORDINATES: 5030015m N, 374771m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	66				FILL - Silty Clay and Gravel, brown, moist	GS1				27 46 (27)
1.0					becoming compact	SS2		12		
	65				SILTY CLAY - very stiff, grey-brown, moist	SS3		10		PP = 195 kPa
2.0										
	64					SS4		6		PP = 98 kPa
3.0					becoming stiff, grey, and wet	SS5		5		PP = 50 kPa
	63									
4.0					becoming very stiff	FV1			>> ✖	FV1 = 125 kPa, St = 4
						FV2			>> ✖	FV2 = 115 kPa, St = 4
	62				SILT - loose, grey, wet	SS6		9		
5.0										
	61				becoming very loose	SS7		4		
6.0										
	60				SILT and SAND (Till) - some Clay, some Gravel, loose, brown, moist	SS8		5		
7.0										
	59				becoming dense	SS9		33		
8.0										
	58				End of borehole at approximately 8.2 m in Till.					
9.0										
	57									
10.0										
	56									
11.0										
	55									
12.0										
	54									
13.0										
	53									
14.0										
	52									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 2

LOG OF BOREHOLE BH19-03

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.00 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 19, 2019
COORDINATES: 5030070m N, 374669m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				ASPHALT - Approximately 50 mm thick					
					FILL - Silty Sand and Gravel, brown, moist	GS1				39 36 (25)
1.0	66				FILL - Clayey Silty Sand, trace Gravel, loose, brown, moist (reworked local soil)	SS2		4		
2.0	65					SS3		3		
						SS4		2		
3.0	64				presence of fibre	SS5		37		
4.0	63				SILT - some Clay, stiff, grey, wet	SS6		6		PP = 98 kPa
5.0	62					SS7		8		PP = 50 kPa
					SILTY SAND (Till) - some Clay, loose, brown, wet	SS8		8		
6.0	61				becoming dense	SS9		40		
7.0	60									
8.0	59					SS10		49		
8.2	58.8				End of borehole at approximately 8.2 m in Till, continued with Dynamic Cone Penetration Test (DCPT). DCPT refusal at 9.3 m.					
9.0	58									
10.0	57									
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 3

LOG OF BOREHOLE BH19-05

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.10 metres

Drilling Data
METHOD: Hollow Stem Auger & Rock Coring
DIAMETER: 200 mm
DATE: March 20, 2019
COORDINATES: 5030051m N, 374727m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				CONCRETE PAVEMENT - Approximately 300 mm thick					
					FILL - Silt, some Gravel (frozen), grey, moist	SS1		24		
1.0	66									
					SILTY CLAY - very stiff, grey-brown, moist	SS2		12		PP = 145 kPa
2.0	65					SS3		10		PP = 145 kPa
3.0	64				becoming stiff	SS4		8		PP = 98 kPa
4.0	63				becoming firm	SS5		7		PP = 49 kPa
						FV1			✖	FV1 = 96 kPa, St = 3
5.0	62					FV2				FV2 = Refusal
					SILT - trace Gravel, loose, grey, wet	SS6		5		10 16 67 7
6.0	61				SANDY SILT (Till) - some Clay, some Gravel, loose, grey-brown, wet	SS7		5		33 33 26 8
7.0	60									
					becoming compact	SS8		19		15 45 (40)
8.0	59				cobbles and/or boulders	RC1				
9.0	58				BEDROCK - Limestone interbedded with Shale, slightly weathered to fresh, dark grey to grey, fine grained, faintly porous, fair rock quality based on RQD	RC2				TCR = 100 % SCR = 61 % RQD = 71 %
10.0	57									
					becoming good rock quality based on RQD	RC3				TCR = 98 % SCR = 82 % RQD = 78 %
11.0	56									
					becoming fair rock quality based on RQD	RC4				TCR = 100 % SCR = 87 % RQD = 67 %
12.0	55				End of borehole at approximately 12.2 m in Bedrock.					
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 4

LOG OF BOREHOLE BH19-07

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.50 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030127m N, 374768m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				CONCRETE PAVEMENT - Approximately 250 mm thick	GS1				
0.3					FILL - Silty Sand and Gravel (frozen), brown, moist, presence of metal	SS2		>99		
1.0	66				SS refusal, continued with augering					
1.5					becoming compact	SS3		21		OVC = 35 PPM
2.0	65									
2.5					SILTY CLAY - very stiff, grey-brown, moist	SS4		10		PP = 145 kPa
3.0	64					SS5		10		PP = 98 kPa
4.0						SS6		7		PP = 74 kPa
4.3	63				becoming stiff					
4.6					CLAY and SILT - firm, grey, wet	SS7		2		PP = 49 kPa
5.0	62					FV1				FV1 > 150 kPa
5.5					SILT - firm, grey, wet				>>✖	
6.0						SS8		5		
6.4	61				End of borehole at approximately 6.4 m in Silt, continued with Dynamic Cone Penetration Test (DCPT).				◆	
7.0	60								◆	
8.0	59								◆	
9.0	58								◆	
10.0	57				DCPT refusal at approximately 10.2 m.				◆	
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 5

LOG OF BOREHOLE BH19-08

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.60 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 18, 2019
COORDINATES: 5030181m N, 374789m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				FILL - Sand and Gravel, grey-brown, moist	GS1				OVC = 155 PPM
1.0					becoming compact to dense	SS2		>99		OVC = 360 PPM
	66				FILL - Silty Clay, grey-brown, moist					
2.0						SS3		23		OVC = 10 PPM
	65					SS4		11		
3.0					SILTY CLAY - stiff, grey-brown, wet					
	64					SS5		8		PP = 123 kPa
4.0						SS6		8		No recovery in SS6
	63									
5.0						SS7		5		PP = 74 kPa
					SILT - trace Clay, trace Sand, stiff, grey, wet	FV1			✖	FV1 = 92 kPa
	62					FV2			✖	FV2 > 96 kPa, St = 6
6.0						SS8		11		
	61				End of borehole at approximately 6.4 m in Silt.					
7.0										
	60									
8.0										
	59									
9.0										
	58									
10.0										
	57									
11.0										
	56									
12.0										
	55									
13.0										
	54									
14.0										
	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 6

LOG OF BOREHOLE BH19-10B

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.20 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 18, 2019
COORDINATES: 5030211m N, 374808m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l) 20 40 60 80	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ 20 40 60 80; SPT (N) □ Blows/0.3m DCPT ◆ 20 40 60 80	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67.20		●		FILL - Silty Sand and Gravel (frozen), grey-black, moist	GS1				OVC = 35 PPM
1.0	66.20				SS refusal, continued with augering	SS2		>99		OVC = 10 PPM
					Auger refusal at 1.2 m in Fill.					
2.0	65.20									
3.0	64.20									
4.0	63.20									
5.0	62.20									
6.0	61.20									
7.0	60.20									
8.0	59.20									
9.0	58.20									
10.0	57.20									
11.0	56.20									
12.0	55.20									
13.0	54.20									
14.0	53.20									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

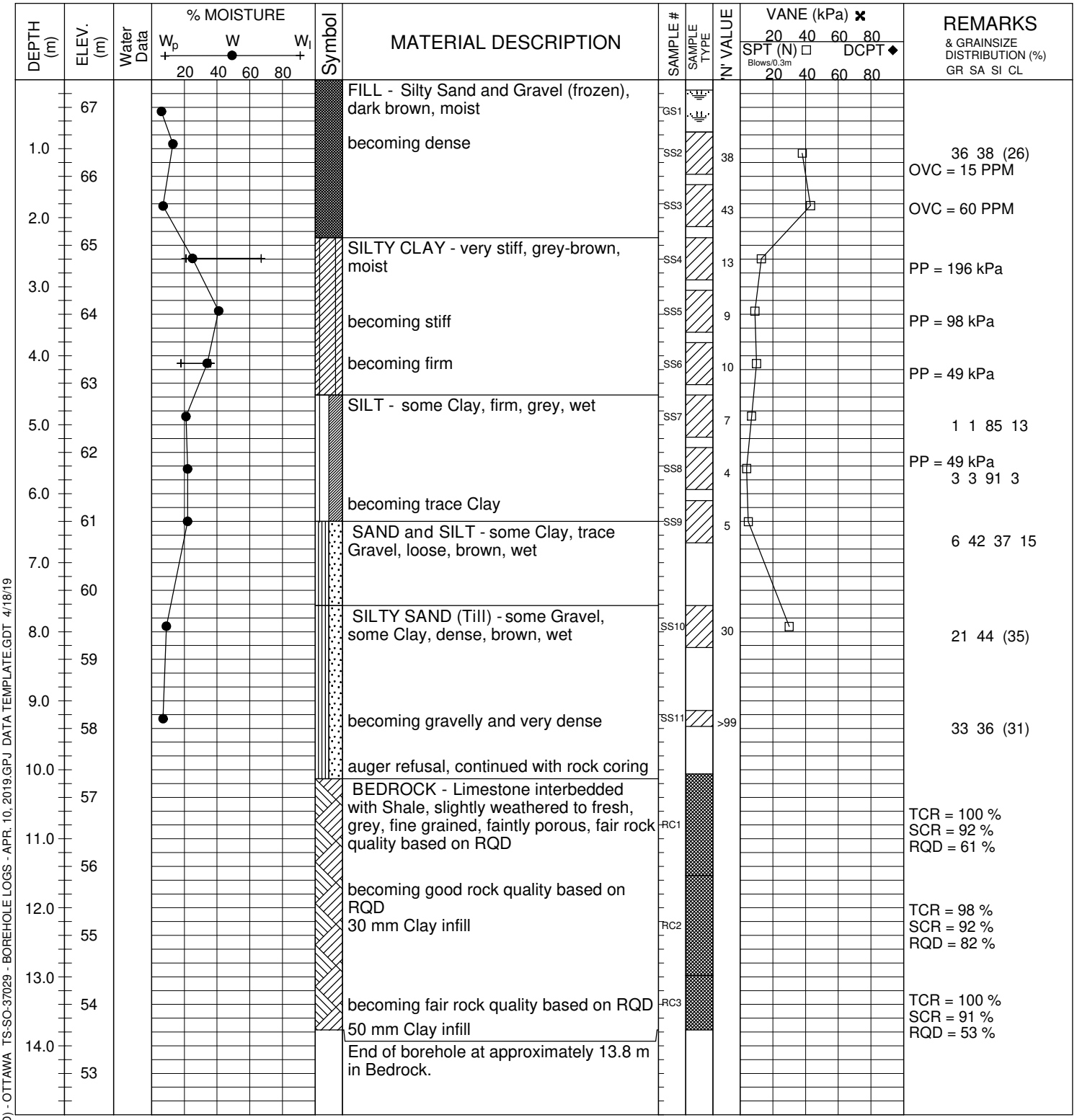
- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 7

LOG OF BOREHOLE BH19-11B

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.40 metres

Drilling Data
METHOD: Hollow Stem Auger & Rock Coring
DIAMETER: 200 mm
DATE: March 20, 2019
COORDINATES: 5030191m N, 374808m E



BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 8

LOG OF BOREHOLE BH19-12

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.60 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030153m N, 374829m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l) 20 40 60 80	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ 20 40 60 80; SPT (N) □ Blows/0.3m DCPT ◆ 20 40 60 80	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67		●		FILL - Silty Sand and Gravel (frozen), some cobbles, dark brown, moist, deleterious material (presence of metal)	GS1				OVC = 75 PPM
1.0					SS refusal, continued with augering	SS2		>99		OVC = 20 PPM
	66				SS refusal, continued with augering	SS3		>99		OVC = 60 PPM
2.0					Auger refusal at 1.8 m in Fill.					
	65									
3.0										
	64									
4.0										
	63									
5.0										
	62									
6.0										
	61									
7.0										
	60									
8.0										
	59									
9.0										
	58									
10.0										
	57									
11.0										
	56									
12.0										
	55									
13.0										
	54									
14.0										
	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 9

LOG OF BOREHOLE BH19-13

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.70 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030112m N, 374849m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				FILL - Silty Sand and Gravel (frozen), trace cobbles, deleterious material (brick, metal, and concrete debris), dark brown, moist	GS1				
1.0	66				becoming dense to very dense presence of steel SS refusal, continued with augering	SS2		71		OVC = 5 PPM
2.0						SS3		77		
3.0	65				SILTY CLAY - very stiff, grey-brown, moist	SS4		13		PP = 122 kPa
						SS5		17		PP = 98 kPa
4.0	64				End of borehole at approximately 3.5 m in Silty Clay.					
5.0	63									
6.0	62									
7.0	61									
8.0	60									
9.0	59									
10.0	58									
11.0	57									
12.0	56									
13.0	55									
14.0	54									
	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 10

LOG OF BOREHOLE BH19-14

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.60 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030113m N, 374810m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l) 20 40 60 80	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ 20 40 60 80; SPT (N) □ Blows/0.3m DCPT ◆ 20 40 60 80	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67		●		FILL - Silty Sand and Gravel (frozen), cobbles, dark brown, moist, deleterious material (presence of bricks and metal) SS refusal, continued with augering	GS1				
1.0	66				Auger refusal at 1.2 m in Fill.	SS2		>99		
2.0	65									
3.0	64									
4.0	63									
5.0	62									
6.0	61									
7.0	60									
8.0	59									
9.0	58									
10.0	57									
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 11

LOG OF BOREHOLE BH19-15

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.00 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030128m N, 374659m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l) 20 40 60 80	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ 20 40 60 80; SPT (N) □ Blows/0.3m DCPT ◆ 20 40 60 80	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				ASPHALT - Approximately 40 mm thick					
					FILL - Silty Sand and Gravel (frozen), brown, damp	GS1				
1.0	66				SILTY CLAY - very stiff, grey-brown, moist	SS2		21		
2.0	65					SS3		10		PP = 145 kPa
					End of borhole at approximately 2.1 m in Silty Clay.					
3.0	64									
4.0	63									
5.0	62									
6.0	61									
7.0	60									
8.0	59									
9.0	58									
10.0	57									
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 12

LOG OF BOREHOLE MW19-04

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.30 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 21, 2019
COORDINATES: 5030100m N, 374737m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l)	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ / SPT (N) □ Blows/0.3m / DCPT ◆	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				CONCRETE PAVEMENT - Approximately 270 mm thick	GS1				
1.0	66				FILL - Sand, some Gravel, presence of bricks, brown, moist SS refusal, continued with augering presence of hydrocarbon staining becoming compact	SS2		50		OVC = 15 PPM
2.0	65					SS3		16		
3.0	64				SILTY CLAY - very stiff, grey-brown, moist	SS4		12		PP = 145 kPa, OVC = 10 PPM
4.0	63				becoming stiff	SS5		8		PP = 145 kPa
5.0	62				SILT and CLAY - firm, grey, wet	SS6		11		PP = 74 kPa
6.0	61				SILT - loose, grey, wet	SS7		4		PP = 49 kPa
7.0	60				SANDY SILT (Till) - some Clay, some Gravel, very loose, brown, wet becoming loose	SS8		7		PP = 49 kPa
8.0	59				becoming compact	SS9		3		
9.0	58				End of borehole at approximately 8.2 m in Till.	SS10		9		
10.0	57					SS11		13		Groundwater at 3.5 mbgs, measured on March 29, 2019.
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

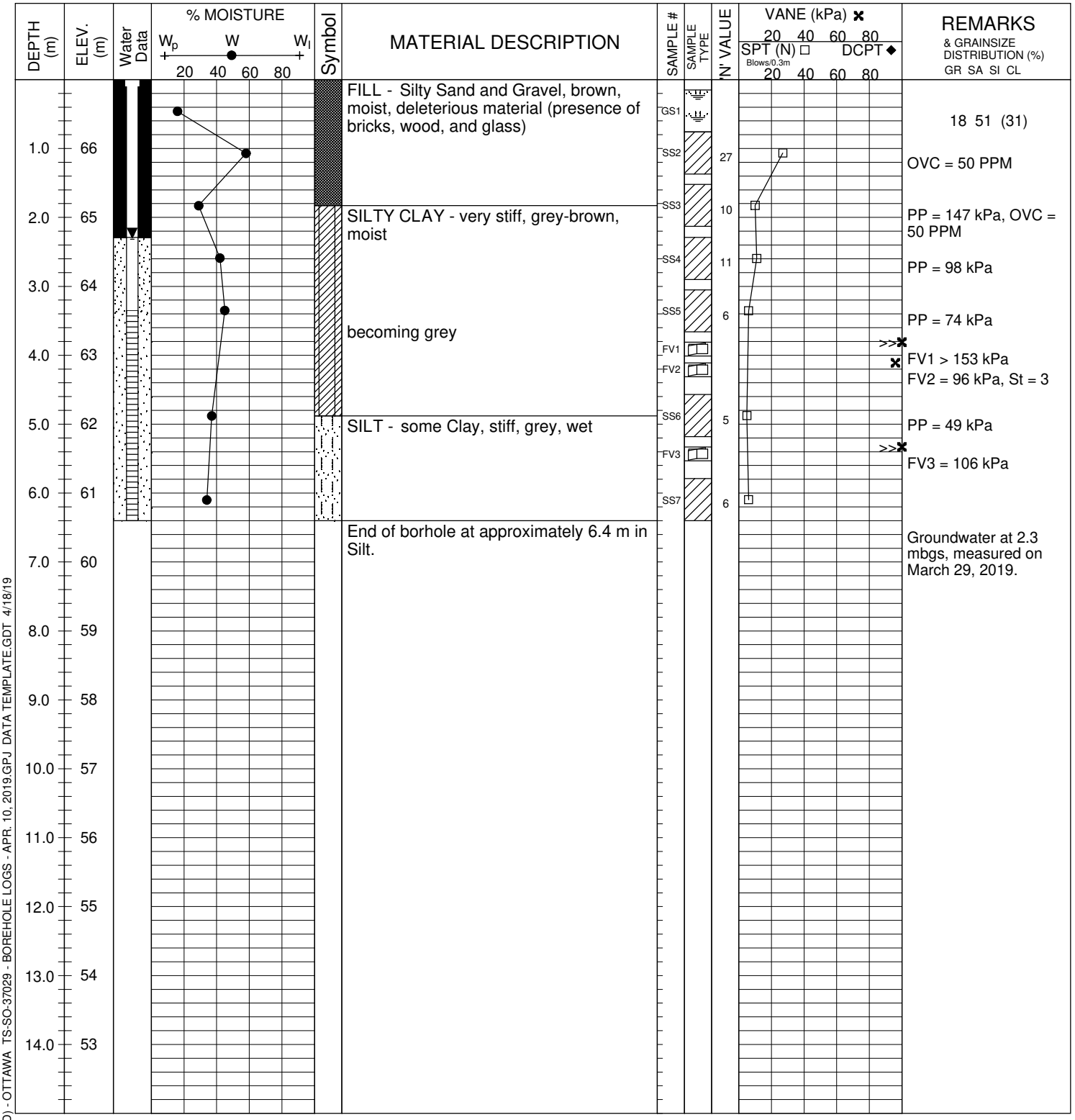
- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 13

LOG OF BOREHOLE MW19-06

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.00 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 19, 2019
COORDINATES: 5030034m N, 374806m E



BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 14

LOG OF BOREHOLE MW19-09

DST REF. No.: TS-SO-037029
CLIENT: AIM Recycling Ottawa East
PROJECT: Limited Phase II Environmental Site Assessment
LOCATION: 2555 Sheffield Road, Ottawa, ON
SURFACE ELEV.: 67.30 metres

Drilling Data
METHOD: Hollow Stem Auger
DIAMETER: 200 mm
DATE: March 18, 2019
COORDINATES: 5030200m N, 374780m E

DEPTH (m)	ELEV. (m)	Water Data	% MOISTURE (W_p W W_l) 20 40 60 80	Symbol	MATERIAL DESCRIPTION	SAMPLE #	SAMPLE TYPE	'N' VALUE	VANE (kPa) ✖ 20 40 60 80; SPT (N) □ Blows/0.3m; DCPT ◆ 20 40 60 80	REMARKS & GRAINSIZE DISTRIBUTION (%) GR SA SI CL
0.0	67				FILL - Silty Sand and Gravel (frozen), dark brown, moist	GS1				OVC = 145 PPM
1.0	66				becoming dense to very dense	SS2		75		OVC = 45 PPM
2.0	65				FILL- Silty Clay, grey-brown, moist	SS3		14		OVC = 115 PPM
						SS4		11		OVC = 55 PPM
3.0	64				SILTY CLAY - stiff, grey-brown, moist	SS5		8		OVC = 25 PPM PP = 98 kPa
4.0	63					SS6		9		PP = 74 kPa
5.0	62					SS7		8		PP = 49 kPa
6.0	61				SILT - loose, grey, wet	SS8		9		Groundwater at 2.3 mbgs, measured on March 29, 2019.
					End of borehole at approximately 6.1 m in Silt.					
7.0	60									
8.0	59									
9.0	58									
10.0	57									
11.0	56									
12.0	55									
13.0	54									
14.0	53									

BOREHOLE (STANDARD) - OTTAWA TS-SO-37029 - BOREHOLE LOGS - APR. 10, 2019.GPJ DATA TEMPLATE.GDT 4/18/19

DST consulting engineers
a division of Englobe

DST Consulting Engineers Inc.
203 - 2150 THURSTON DRIVE
OTTAWA, ONTARIO, K1G 5T9
PH: (613)748-1415
FX: (613)748-1356
Email: ottawa@dstgroup.com
Web: www.dstgroup.com

SAMPLE TYPE LEGEND

- Auger Sample
- Split Spoon Sample
- Bulk Sample
- Rock Core
- Field Vane
- 70mm Thin Wall Tube
- Bentonite
- Sand

ENCLOSURE 15

APPENDIX D

Laboratory Analytical Results

TABLE D-1: SOIL ANALYTICAL RESULTS - HYDROCARBONS

Parameter Description	Standards	Standards	Analytical Results (g/g) Sampling ID / Sampling Date / Depth Interval (m)														
	MOECC Table 1[(1)]	MOECC Table 3[(1)]	BH19-1 SS#5	BH19-2 SS#2	BH19-3 SS#2	BH19-4 SS#2	BH19-5 SS#1	BH19-6 SS#2	BH19-7 SS#4	BH19-8 SS#4	BH19-9 SS#4	BH19-10B SS#2	BH19-11B SS#3	BH19-12 SS#2	BH19-13 SS#2	BH19-14 GS#1	BH19-15 GS#1
			19-Mar-19	19-Mar-19	19-Mar-19	21-Mar-19	20-Mar-19	19-Mar-19	21-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	20-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19
			3.8 - 4.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	2.3 - 2.9	2.3 - 2.9	2.3 - 2.9	0.8 - 1.2	1.5 - 2.1	0.8 - 1.4	0.8 - 1.4	0.2 - 0.6	0.2 - 0.6
BTEX																	
Benzene	0.02	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Toluene	0.2	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.14	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	0.05	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
m,p-Xylene	NG	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.33	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	NG	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.22	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	0.05	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
PHCs																	
F1 PHCs (C6-C10)	25	55	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)	96	ND (7)	ND (7)	ND (7)	ND (7)	ND (7)
F2 PHCs (C10-C16)	10	230	ND (4)	ND (4)	ND (4)	9	ND (4)	ND (40)	ND (4)	ND (4)	ND (4)	265	81	829	65	121	23
F3 PHCs (C16-C34)	240	1700	ND (8)	28	ND (8)	193	22	1020	95	ND (8)	44	1630	1210	2970	2810	895	341
F4 PHCs (C34-C50)	120	3300	ND (6)	ND (6)	ND (6)	55	28	67	24	ND (6)	21	1230	452	1340	1610	358	415

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

Phase II Environmental Site Assessment
AIM Recycling Ottawa East
2555 Sheffield Road, Ottawa, Ontario
DST File No.: TS-SO-037029

TABLE D-2: SOIL ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS (VOCs)

Parameter Description	Standards	Standards	Analytical Results (g/g) Sampling ID / Sampling Date / Depth Interval (m)														
	MOECC Table 1[1]	MOECC Table 3[1]	BH19-1 SS#5	BH19-2 SS#2	BH19-3 SS#2	BH19-4 SS#2	BH19-5 SS#1	BH19-6 SS#2	BH19-7 SS#4	BH19-8 SS#4	BH19-9 SS#4	BH19-10 SS#2	BH19-11B SS#3	BH19-12 SS#2	BH19-13 SS#2	BH19-14 GS#1	BH19-15 GS#1
			19-Mar-19	19-Mar-19	19-Mar-19	21-Mar-19	20-Mar-19	19-Mar-19	21-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	20-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19
			3.8 - 4.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	2.3 - 2.9	2.3 - 2.9	2.3 - 2.9	0.8 - 1.2	1.5 - 2.1	0.8 - 1.4	0.8 - 1.4	0.2 - 0.6	0.2 - 0.6
Acetone	0.5	16	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Benzene	0.02	0.32	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
Bromodichloromethane	0.05	18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromoform	0.05	0.61	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Bromomethane	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Carbon Tetrachloride	0.05	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chlorobenzene	0.05	2.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chloroform	0.05	0.47	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibromochloromethane	0.05	13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dichlorodifluoromethane	0.05	16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichlorobenzene	0.05	6.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichlorobenzene	0.05	9.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,4-Dichlorobenzene	0.05	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethane	0.05	17	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloroethane	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1-Dichloroethylene	0.05	0.064	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,2-Dichloroethylene	0.05	55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,2-Dichloroethylene	0.05	1.3	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,2-Dichloropropane	0.05	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
cis-1,3-Dichloropropylene	0.05	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
trans-1,3-Dichloropropylene	0.05	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,3-Dichloropropene, total	0.05	0.18	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylbenzene	0.05	9.5	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.16	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Ethylene dibromide (dibromoethane, 1,2-	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Hexane	0.05	46	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.13	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methyl Ethyl Ketone (2-Butanone)	0.5	70	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl Isobutyl Ketone	0.5	31	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)	ND (0.50)
Methyl tert-butyl ether	0.05	11	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylene Chloride	0.05	1.6	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Styrene	0.05	34	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1,2-Tetrachloroethane	0.05	0.187	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2,2-Tetrachloroethane	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Tetrachloroethylene	0.05	4.5	ND (0.05)	0.68	0.10	ND (0.05)	ND (0.05)	0.21	ND (0.05)	1.74	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Toluene	0.2	68	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.14	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,1-Trichloroethane	0.05	6.1	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1,1,2-Trichloroethane	0.05	0.05	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichloroethylene	0.05	0.91	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Trichlorofluoromethane	0.25	4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.21	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Vinyl Chloride	0.02	0.032	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)	ND (0.02)
m,p-Xylene	NG	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.33	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
o-Xylene	NG	NG	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.22	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Xylenes, total	0.05	26	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	0.55	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

Phase II Environmental Site Assessment
AIM Recycling Ottawa East
2555 Sheffield Road, Ottawa, Ontario
DST File No.: TS-SO-037029

TABLE D-3: SOIL ANALYTICAL RESULTS - Metals

Parameter Description	Standards	Standards	Analytical Results (g/g) Sampling ID / Sampling Date / Depth Interval (m)														
	MECP Table 1[(1)]	MECP Table 3[(1)]	BH19-1 SS#5	BH19-2 SS#2	BH19-3 SS#2	BH19-4 SS#2	BH19-5 SS#1	BH19-6 SS#2	BH19-7 SS#4	BH19-8 SS#4	BH19-9 SS#4	BH19-10B SS#2	BH19-11B SS#3	BH19-12 SS#2	BH19-13 SS#2	BH19-14 GS#1	BH19-15 GS#1
			19-Mar-19	19-Mar-19	19-Mar-19	21-Mar-19	20-Mar-19	19-Mar-19	21-Mar-19	18-Mar-19	18-Mar-19	18-Mar-19	20-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19	21-Mar-19
			3.8 - 4.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	0.8 - 1.4	2.3 - 2.9	2.3 - 2.9	2.3 - 2.9	0.8 - 1.2	1.5 - 2.1	0.8 - 1.4	0.8 - 1.4	0.2 - 0.6	0.2 - 0.6
Chromium (VI)	0.66	8.0	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Mercury	0.27	3.9	ND (0.1)	ND (0.1)	ND (0.1)	0.2	ND (0.1)	1.1	ND (0.1)	ND (0.1)	ND (0.1)	1.6	1.4	0.9	0.7	1.1	ND (0.1)
Antimony	1.3	40	ND (1.0)	ND (1.0)	ND (1.0)	1.1	ND (1.0)	8.8	2.1	ND (1.0)	ND (1.0)	2.1	8.1	11.2	7.3	6.0	1.9
Arsenic	18	18.0	1.70	4.50	2.70	5.00	3.20	12.90	4.50	2.90	3.50	7.4	9.70	13.1	10.70	11.70	6.10
Barium	220	670	150	239	161	272	151	490	306	105	328	114	490	557	374	116	200
Beryllium	2.5	8.0	ND (0.5)	0.9	0.6	ND (0.5)	0.7	ND (0.5)	1.0	0.6	0.9	ND (0.5)	ND (0.5)	0.6	0.5	ND (0.5)	ND (0.5)
Boron	36	120	5.3	11.4	6.2	14.7	9.6	26.4	10.8	11.6	6.8	24.6	31.1	59.2	27.6	17.3	9.4
Cadmium	1.2	1.9	ND (0.5)	1.2	ND (0.5)	0.5	ND (0.5)	8.6	0.7	ND (0.5)	ND (0.5)	1.6	5.2	10.5	5.5	1.8	5.0
Chromium	70	160	31.0	64.8	43.5	29.3	53.3	69.0	90.8	50.2	91.6	47.3	62.7	96.1	89.7	61.5	24.9
Cobalt	21	80	7.8	17.0	11.3	14.7	12.3	13.7	19.0	10.1	20.3	8.8	10.8	17.3	12.8	10.8	7.3
Copper	92	230	16.9	59.3	23.9	86.8	17.1	249	55.2	22.7	49.1	323	477	510	582	130	50.9
Lead	120	120	4.4	24.3	7.2	91.1	8.1	485	162	8.5	12.5	135	591	681	517	237	112
Molybdenum	2.0	40	ND (1.0)	4.3	ND (1.0)	2.6	ND (1.0)	9.5	1.1	ND (1.0)	ND (1.0)	9.3	10.5	13.1	16.0	8.0	2.2
Nickel	82	270	16.2	35.4	24.3	19.0	24.7	226	52.7	25.7	47.9	48.7	96.2	122	104	43.6	38.7
Selenium	1.5	5.5	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Silver	0.5	34	ND (0.3)	ND (0.3)	ND (0.3)	1.3	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	ND (0.3)	1.5	0.7	5.6	1.0	0.4	ND (0.3)
Thallium	1.0	3.3	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Uranium	2.5	33	1.1	ND (1.0)	ND (1.0)	ND (1.0)	1.1	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vanadium	86	86	45.6	68.7	54.8	24.8	58.6	44.20	93.40	51.3	98.7	26.0	32.4	50.7	49.6	17.4	20.8
Zinc	290	340	44.3	165	69.0	201	86.9	4140	291	78.7	176	579	1850	3740	1980	681	618

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

TABLE D-4: GROUNDWATER ANALYTICAL RESULTS - VOLATILE ORGANIC COMPOUNDS (VOCs)

Parameter Description	Standards	Standards	Analytical Results (g/L) (Sampling ID / Sampling Date)			
	MOECC Table 1[1]	MOECC Table 3[1]	MW19-4	MW19-6	MW19-9	MW19-9 (Duplicate)
			29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
Acetone	2700	130000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Benzene	0.5	44	1.3	ND (0.5)	ND (0.5)	ND (0.5)
Bromodichloromethane	2	85000	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromoform	5	380	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Bromomethane	0.89	5.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Carbon Tetrachloride	0.2	0.79	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Chlorobenzene	0.5	630	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Chloroform	2	2.4	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dibromochloromethane	2	82000	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Dichlorodifluoromethane	590	4400	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
1,2-Dichlorobenzene	0.5	4600	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichlorobenzene	0.5	9600	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,4-Dichlorobenzene	0.5	8	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethane	0.5	320	0.5	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloroethane	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1-Dichloroethylene	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,2-Dichloroethylene	1.6	1.6	4.1	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,2-Dichloroethylene	1.6	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,2-Dichloropropane	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
cis-1,3-Dichloropropylene	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
trans-1,3-Dichloropropylene	1.6	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,3-Dichloropropene, total	0.5	5.2	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylbenzene	0.5	2300	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Ethylene dibromide (dibromoethane, 1,2-)	0.2	0.25	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)
Hexane	5	51	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Methyl Ethyl Ketone (2-Butanone)	400	470000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl Isobutyl Ketone	640	140000	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Methyl tert-butyl ether	15	190	ND (2.0)	ND (2.0)	ND (2.0)	ND (2.0)
Methylene Chloride	5	610	ND (5.0)	ND (5.0)	ND (5.0)	ND (5.0)
Styrene	0.3	1300	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1,2-Tetrachloroethane	1.1	3.3	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2,2-Tetrachloroethane	0.5	3.2	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Tetrachloroethylene	0.5	1.6	1.1	1.5	3.3	3.6
Toluene	0.8	18000	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,1-Trichloroethane	0.5	640	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
1,1,2-Trichloroethane	0.5	4.7	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichloroethylene	0.5	1.6	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Trichlorofluoromethane	150	2500	ND (1.0)	ND (1.0)	ND (1.0)	ND (1.0)
Vinyl Chloride	0.5	0.5	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
m,p-Xylene	NG	NG	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
o-Xylene	NG	NG	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Xylenes, total	72	4200	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

TABLE D-5: GROUNDWATER ANALYTICAL RESULTS - pH and PAHs

Parameter Description	Standards	Standards	Analytical Results (g/L) (Sampling ID / Sampling Date)			
	MOECC Table 1[1]	MOECC Table 3[1]	MW19-4	MW19-6	MW19-9	MW19-9 (Duplicate)
			29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
General						
pH	NG	NG	6.8	7.5	7.4	7.4
PAHs						
Acenaphthene	4.1	600	ND (0.05)	ND (0.05)	0.38	ND (0.05)
Acenaphthylene	1	1.8	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Anthracene	0.1	2.4	ND (0.01)	ND (0.01)	0.05	ND (0.01)
Benzo[a]anthracene	0.2	4.7	ND (0.01)	ND (0.01)	0.04	ND (0.01)
Benzo[a]pyrene	0.01	0.81	ND (0.01)	ND (0.01)	0.03	ND (0.01)
Benzo[b]fluoranthene	0.1	0.75	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[g,h,i]perylene	0.2	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Benzo[k]fluoranthene	0.1	0.4	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Chrysene	0.1	1	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Dibenzo[a,h]anthracene	0.2	0.52	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Fluoranthene	0.4	130	ND (0.01)	ND (0.01)	0.08	ND (0.01)
Fluorene	120	400	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Indeno[1,2,3-cd]pyrene	0.2	0.2	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
1-Methylnaphthalene	NG	1800	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
2-Methylnaphthalene	NG	1800	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Methylnaphthalene (1&2)	2	1800	ND (0.10)	ND (0.10)	ND (0.10)	ND (0.10)
Naphthalene	7	1400	ND (0.05)	ND (0.05)	ND (0.05)	ND (0.05)
Phenanthrene	0.1	580	ND (0.05)	ND (0.05)	0.08	ND (0.05)
Pyrene	0.2	68	ND (0.01)	ND (0.01)	0.07	ND (0.01)
PHCs						
F1 PHCs (C6-C10)	420	750	ND (25)	ND (25)	ND (25)	ND (25)
F2 PHCs (C10-C16)	150	150	ND (100)	ND (100)	ND (100)	ND (100)
F3 PHCs (C16-C34)	500	500	ND (100)	ND (100)	ND (100)	ND (100)
F4 PHCs (C34-C50)	500	500	ND (100)	ND (100)	ND (100)	ND (100)

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

TABLE D-6: GROUNDWATER ANALYTICAL RESULTS - Metals

Parameter Description	Standards	Standards	Analytical Results (g/L) (Sampling ID / Sampling Date)			
	MOECC Table 1[1]	MOECC Table 3[1]	MW19-4	MW19-6	MW19-9	MW19-9 (Duplicate)
			29-Mar-19	29-Mar-19	29-Mar-19	29-Mar-19
Mercury	0.1	0.29	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Antimony	1.5	2000	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Arsenic	13	1900	ND (1)	ND (1)	1	1
Barium	640	29000	187	184	975	993
Beryllium	0.5	67	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)
Boron	1700	45000	836	35	27	27
Cadmium	0.5	2.7	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Chromium	11	810	ND (1)	ND (1)	ND (1)	ND (1)
Chromium (VI)	25	140	ND (10)	ND (10)	ND (10)	ND (10)
Cobalt	3.8	66	3.6	1.0	1.4	1.5
Copper	5	87	1.1	ND (0.5)	0.6	8.7
Lead	1.9	25	0.2	ND (0.1)	0.2	1.3
Molybdenum	23	9200	1.8	1.6	2.3	2.2
Nickel	14	490	13	3	5	6
Selenium	5	63	ND (1)	ND (1)	ND (1)	ND (1)
Silver	0.3	1.5	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Sodium	490000	2300000	198000	29100	36200	37200
Thallium	0.5	510	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)
Uranium	8.9	420	0.9	0.5	3.0	3.3
Vanadium	3.9	250	0.8	0.5	1.4	1.7
Zinc	160	1100	22	ND (5)	11	35

Notes:

(1) Ministry of the Environment, Conservation and Parks (MECP), "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", July 1, 2011. Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition. Industrial/Commercial/Community Property Use. Coarse textured soils.

'NG' indicates that there is no guideline value under MECP Table 3.

All units are expressed in micrograms per gram (g/g), unless otherwise specified.

'ND' indicates that a value is below the laboratory detection limit (value indicated).

Value 'Indicates that a value exceeds MECP Table 3 standards.

Value 'Indicates that a value exceeds MECP Table 1 standards.

Table D-7 - Toxicity Characteristic Leaching Procedure Results

Parameter	Standards	Units	Analytical Results (g/g) Sampling ID / Sampling Date / Depth Interval (m)
	O. Reg. 558 Schedule 4		BH19-12 GS# and BH19-13 GS#1
			21/Mar/19
			0.2 -0.8
TCLP Metals & Inorganics			
Leachable WAD Cyanide (Free)	20	mg/L	0.02
Leachable Fluoride (F-)	150	mg/L	0.45
Leachable Nitrate (N)	NV	mg/L	1
Leachable Nitrite (N)	NV	mg/L	1
Leachable Nitrate + Nitrite (N)	1000	mg/L	2
Leachable Arsenic (As)	2.5	mg/L	0.05
Leachable Barium (Ba)	100	mg/L	1.63
Leachable Boron (B)	500	mg/L	0.2
Leachable Cadmium (Cd)	0.5	mg/L	0.02
Leachable Chromium (Cr)	5	mg/L	0.05
Leachable Lead (Pb)	5	mg/L	0.27
Leachable Mercury (Hg)	0.1	mg/L	0.005
Leachable Selenium (Se)	1	mg/L	0.05
Leachable Silver (Ag)	5	mg/L	0.05
Leachable Uranium (U)	10	mg/L	0.05
TCLP Volatile Organic Compounds (VOCs)			
Leachable Benzene	0.5	mg/L	0.005
Flash Point			
Closed Cup Flash Point	<61	deg. C	>70

Notes

O. Reg. 558 Schedule 4	Schedule 4 - Leachate Quality Criteria of Regulation 347 as amended by Ontario Regulation 558/00.
RDL	Reportable Detection Limit
NV	No Criteria/RDL Value
'<'	Values is less than the RDL

APPENDIX E

Laboratory Certificates of Analysis

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Shahab Nowrozi

Client PO:
Project: TS SO 37029
Custody: 46537

Report Date: 26-Mar-2019
Order Date: 21-Mar-2019

Order #: 1912587

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

Paracel ID	Client ID
1912587-01	BH19-4 SS2
1912587-02	BH19-7 SS4
1912587-03	BH19-12 SS2
1912587-04	BH19-13 SS2
1912587-05	BH19-14 GS1
1912587-06	BH19-15 GS1

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 21-Mar-2019
Project Description: TS SO 37029

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	22-Mar-19	25-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	26-Mar-19	26-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	21-Mar-19	23-Mar-19
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	25-Mar-19	26-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-Mar-19	24-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	26-Mar-19	26-Mar-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	22-Mar-19	24-Mar-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	21-Mar-19	24-Mar-19
Solids, %	Gravimetric, calculation	25-Mar-19	25-Mar-19

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 26-Mar-2019

Order Date: 21-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-4 SS2	BH19-7 SS4	BH19-12 SS2	BH19-13 SS2
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00
	Sample ID:	1912587-01	1912587-02	1912587-03	1912587-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	89.8	79.5	89.5	95.0
Metals					
Antimony	1.0 ug/g dry	1.1	2.1	11.2	7.3
Arsenic	1.0 ug/g dry	5.0	4.5	13.1	10.7
Barium	1.0 ug/g dry	272	306	557	374
Beryllium	0.5 ug/g dry	<0.5	1.0	0.6	0.5
Boron	5.0 ug/g dry	14.7	10.8	59.2	27.6
Cadmium	0.5 ug/g dry	0.5	0.7	10.5	5.5
Chromium	5.0 ug/g dry	29.3	90.8	96.1	89.7
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	14.7	19.0	17.3	12.8
Copper	5.0 ug/g dry	86.8	55.2	510	582
Lead	1.0 ug/g dry	91.1	162	681	517
Mercury	0.1 ug/g dry	0.2	<0.1	0.9	0.7
Molybdenum	1.0 ug/g dry	2.6	1.1	13.1	16.0
Nickel	5.0 ug/g dry	19.0	52.7	122	104
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	1.3	<0.3	5.6	1.0
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	24.8	93.4	50.7	49.6
Zinc	20.0 ug/g dry	201	291	3740	1980
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 26-Mar-2019

Order Date: 21-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-4 SS2	BH19-7 SS4	BH19-12 SS2	BH19-13 SS2
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00
	Sample ID:	1912587-01	1912587-02	1912587-03	1912587-04
	MDL/Units	Soil	Soil	Soil	Soil
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	103%	105%	100%	102%
Dibromofluoromethane	Surrogate	109%	112%	113%	109%
Toluene-d8	Surrogate	99.7%	102%	100%	98.0%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	9	<4	829	65

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 21-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-4 SS2	BH19-7 SS4	BH19-12 SS2	BH19-13 SS2
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00	03/21/2019 00:00
	Sample ID:	1912587-01	1912587-02	1912587-03	1912587-04
	MDL/Units	Soil	Soil	Soil	Soil
F3 PHCs (C16-C34)	8 ug/g dry	193	95	2970	2810
F4 PHCs (C34-C50)	6 ug/g dry	55	24	1340 [1]	1610 [1]
F4G PHCs (gravimetric)	50 ug/g dry	-	-	4600	4370
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.43	<0.02	0.20	0.23
Acenaphthylene	0.02 ug/g dry	0.03	<0.02	0.11	0.88
Anthracene	0.02 ug/g dry	0.95	<0.02	0.45	1.69
Benzo [a] anthracene	0.02 ug/g dry	1.80	<0.02	0.68	1.82
Benzo [a] pyrene	0.02 ug/g dry	1.23	<0.02	0.53	1.22
Benzo [b] fluoranthene	0.02 ug/g dry	1.80	<0.02	1.04	1.55
Benzo [g,h,i] perylene	0.02 ug/g dry	0.75	<0.02	0.34	0.66
Benzo [k] fluoranthene	0.02 ug/g dry	1.07	<0.02	0.82	1.04
Chrysene	0.02 ug/g dry	1.66	<0.02	0.65	1.88
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.24	<0.02	0.10	0.22
Fluoranthene	0.02 ug/g dry	5.06	0.06	1.82	2.73
Fluorene	0.02 ug/g dry	0.50	0.02	0.34	1.33
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.65	<0.02	0.31	0.54
1-Methylnaphthalene	0.02 ug/g dry	0.06	<0.02	0.43	2.10
2-Methylnaphthalene	0.02 ug/g dry	0.08	<0.02	0.18	2.91
Methylnaphthalene (1&2)	0.04 ug/g dry	0.14	<0.04	0.61	5.01
Naphthalene	0.01 ug/g dry	0.36	0.03	0.39	2.88
Phenanthrene	0.02 ug/g dry	4.09	0.07	1.44	5.29
Pyrene	0.02 ug/g dry	3.80	0.04	1.65	3.45
2-Fluorobiphenyl	Surrogate	90.7%	57.7%	93.9%	92.3%
Terphenyl-d14	Surrogate	121%	70.3%	103%	42.1% [5]

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 21-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-14 GS1	BH19-15 GS1	-	-
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	-	-
	Sample ID:	1912587-05	1912587-06	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	96.6	96.9	-	-
Metals					
Antimony	1.0 ug/g dry	6.0	1.9	-	-
Arsenic	1.0 ug/g dry	11.7	6.1	-	-
Barium	1.0 ug/g dry	116	200	-	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	-	-
Boron	5.0 ug/g dry	17.3	9.4	-	-
Cadmium	0.5 ug/g dry	1.8	5.0	-	-
Chromium	5.0 ug/g dry	61.5	24.9	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	10.8	7.3	-	-
Copper	5.0 ug/g dry	130	50.9	-	-
Lead	1.0 ug/g dry	237	112	-	-
Mercury	0.1 ug/g dry	1.1	<0.1	-	-
Molybdenum	1.0 ug/g dry	8.0	2.2	-	-
Nickel	5.0 ug/g dry	43.6	38.7	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.3 ug/g dry	0.4	<0.3	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	10.0 ug/g dry	17.4	20.8	-	-
Zinc	20.0 ug/g dry	681	618	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-

	Client ID:	BH19-14 GS1	BH19-15 GS1	-	-
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	-	-
	Sample ID:	1912587-05	1912587-06	-	-
	MDL/Units	Soil	Soil	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethar	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	100%	103%	-	-
Dibromofluoromethane	Surrogate	108%	109%	-	-
Toluene-d8	Surrogate	98.2%	97.0%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 21-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-14 GS1	BH19-15 GS1	-	-
	Sample Date:	03/21/2019 00:00	03/21/2019 00:00	-	-
	Sample ID:	1912587-05	1912587-06	-	-
	MDL/Units	Soil	Soil	-	-
F2 PHCs (C10-C16)	4 ug/g dry	121	23	-	-
F3 PHCs (C16-C34)	8 ug/g dry	895	341	-	-
F4 PHCs (C34-C50)	6 ug/g dry	358 [1]	415 [1]	-	-
F4G PHCs (gravimetric)	50 ug/g dry	1430	1880	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.05	0.34	-	-
Acenaphthylene	0.02 ug/g dry	0.07	0.26	-	-
Anthracene	0.02 ug/g dry	0.19	1.42	-	-
Benzo [a] anthracene	0.02 ug/g dry	0.36	1.59	-	-
Benzo [a] pyrene	0.02 ug/g dry	0.21	1.10	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.80	1.57	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.15	0.70	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.47	0.93	-	-
Chrysene	0.02 ug/g dry	0.33	1.36	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.05	0.22	-	-
Fluoranthene	0.02 ug/g dry	0.58	4.25	-	-
Fluorene	0.02 ug/g dry	0.12	0.52	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.14	0.70	-	-
1-Methylnaphthalene	0.02 ug/g dry	0.10	0.12	-	-
2-Methylnaphthalene	0.02 ug/g dry	0.15	0.13	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.25	0.25	-	-
Naphthalene	0.01 ug/g dry	0.13	0.17	-	-
Phenanthrene	0.02 ug/g dry	0.64	3.59	-	-
Pyrene	0.02 ug/g dry	0.60	3.39	-	-
2-Fluorobiphenyl	Surrogate	101%	119%	-	-
Terphenyl-d14	Surrogate	104%	131%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.18*		*ug/g*		*88.3*	*50-140*			
Surrogate: Terphenyl-d14	*1.61*		*ug/g*		*121*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*9.04*		*ug/g*		*113*	*50-140*			
Surrogate: Dibromofluoromethane	*9.66*		*ug/g*		*121*	*50-140*			
Surrogate: Toluene-d8	*7.71*		*ug/g*		*96.3*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	13	4	ug/g dry	ND			0.0	30	
F3 PHCs (C16-C34)	60	8	ug/g dry	ND			0.0	30	
F4 PHCs (C34-C50)	17	6	ug/g dry	ND			0.0	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	1.3	1.0	ug/g dry	1.4			2.3	30	
Barium	9.6	1.0	ug/g dry	10.4			7.4	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron	ND	5.0	ug/g dry	ND			0.0	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	7.0	5.0	ug/g dry	7.1			2.1	30	
Cobalt	1.8	1.0	ug/g dry	1.8			1.6	30	
Copper	ND	5.0	ug/g dry	ND			0.0	30	
Lead	2.0	1.0	ug/g dry	1.8			8.6	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	ND	5.0	ug/g dry	ND			0.0	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	19.6	10.0	ug/g dry	18.8			3.9	30	
Zinc	ND	20.0	ug/g dry	ND			0.0	30	
Physical Characteristics									
% Solids	92.8	0.1	% by Wt.	93.3			0.5	25	
Semi-Volatiles									
Acenaphthene	0.249	0.02	ug/g dry	0.427			52.8	40	QR-04
Acenaphthylene	0.021	0.02	ug/g dry	0.030			34.4	40	
Anthracene	0.574	0.02	ug/g dry	0.947			49.0	40	QR-04
Benzo [a] anthracene	0.979	0.02	ug/g dry	1.80			59.1	40	QR-04
Benzo [a] pyrene	0.663	0.02	ug/g dry	1.23			60.0	40	QR-04
Benzo [b] fluoranthene	0.972	0.02	ug/g dry	1.80			59.6	40	QR-04
Benzo [g,h,i] perylene	0.399	0.02	ug/g dry	0.746			60.6	40	QR-04
Benzo [k] fluoranthene	0.624	0.02	ug/g dry	1.07			52.5	40	QR-04
Chrysene	1.06	0.02	ug/g dry	1.66			44.0	40	QR-04
Dibenzo [a,h] anthracene	0.128	0.02	ug/g dry	0.237			59.5	40	QR-04
Fluoranthene	2.76	0.02	ug/g dry	5.06			58.9	40	QR-04
Fluorene	0.312	0.02	ug/g dry	0.503			46.9	40	QR-04
Indeno [1,2,3-cd] pyrene	0.393	0.02	ug/g dry	0.650			49.2	40	QR-04
1-Methylnaphthalene	0.054	0.02	ug/g dry	0.060			10.8	40	
2-Methylnaphthalene	0.072	0.02	ug/g dry	0.082			12.3	40	
Naphthalene	0.251	0.01	ug/g dry	0.356			34.7	40	
Phenanthrene	2.32	0.02	ug/g dry	4.09			55.1	40	QR-04
Pyrene	2.13	0.02	ug/g dry	3.80			56.2	40	QR-04
Surrogate: 2-Fluorobiphenyl	*1.40*		*ug/g dry*		*94.1*	*50-140*			
Surrogate: Terphenyl-d14	*1.74*		*ug/g dry*		*117*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND				50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*9.22*		*ug/g dry*		*102*	*50-140*			
Surrogate: Dibromofluoromethane	*9.29*		*ug/g dry*		*102*	*50-140*			
Surrogate: Toluene-d8	*8.82*		*ug/g dry*		*97.3*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	182	7	ug/g		90.8	80-120			
F2 PHCs (C10-C16)	130	4	ug/g	ND	138	60-140			
F3 PHCs (C16-C34)	355	8	ug/g	ND	154	60-140			QM-06
F4 PHCs (C34-C50)	194	6	ug/g	ND	133	60-140			
F4G PHCs (gravimetric)	980	50	ug/g		98.0	80-120			
Metals									
Antimony	46.6		ug/L	ND	93.2	70-130			
Arsenic	51.6		ug/L	ND	102	70-130			
Barium	53.2		ug/L	4.2	98.1	70-130			
Beryllium	53.9		ug/L	ND	108	70-130			
Boron	49.0		ug/L	ND	95.4	70-130			
Cadmium	51.0		ug/L	ND	102	70-130			
Chromium (VI)	3.6	0.2	ug/g		72.5	70-130			
Chromium	52.5		ug/L	ND	99.2	70-130			
Cobalt	48.6		ug/L	ND	95.7	70-130			
Copper	52.5		ug/L	ND	103	70-130			
Lead	46.4		ug/L	ND	91.3	70-130			
Mercury	1.44	0.1	ug/g	ND	96.0	70-130			
Molybdenum	51.4		ug/L	ND	103	70-130			
Nickel	53.5		ug/L	ND	104	70-130			
Selenium	50.2		ug/L	ND	100	70-130			
Silver	47.1		ug/L	ND	94.1	70-130			
Thallium	47.1		ug/L	ND	94.2	70-130			
Uranium	48.1		ug/L	ND	95.9	70-130			
Vanadium	61.4		ug/L	ND	108	70-130			
Zinc	53.1		ug/L	ND	98.4	70-130			
Semi-Volatiles									
Acenaphthene	0.685	0.02	ug/g	0.427	139	50-140			
Acenaphthylene	0.212	0.02	ug/g	0.030	97.9	50-140			
Anthracene	1.20	0.02	ug/g	0.947	137	50-140			
Benzo [a] anthracene	1.98	0.02	ug/g	1.80	97.1	50-140			
Benzo [a] pyrene	1.37	0.02	ug/g	1.23	72.5	50-140			
Benzo [b] fluoranthene	1.90	0.02	ug/g	1.80	56.5	50-140			
Benzo [g,h,i] perylene	0.843	0.02	ug/g	0.746	52.2	50-140			
Benzo [k] fluoranthene	1.40	0.02	ug/g	1.07	177	50-140			QM-06
Chrysene	2.15	0.02	ug/g	1.66	265	50-140			QM-06
Dibenzo [a,h] anthracene	0.387	0.02	ug/g	0.237	80.7	50-140			
Fluoranthene	5.27	0.02	ug/g	5.06	117	50-140			
Fluorene	0.771	0.02	ug/g	0.503	144	50-140			
Indeno [1,2,3-cd] pyrene	0.810	0.02	ug/g	0.650	86.2	50-140			
1-Methylnaphthalene	0.233	0.02	ug/g	0.060	93.0	50-140			
2-Methylnaphthalene	0.282	0.02	ug/g	0.082	108	50-140			
Naphthalene	0.619	0.01	ug/g	0.356	141	50-140			QM-06
Phenanthrene	4.48	0.02	ug/g	4.09	211	50-140			QM-06
Pyrene	4.08	0.02	ug/g	3.80	152	50-140			QM-06
Surrogate: 2-Fluorobiphenyl	*1.28*		*ug/g*		*86.1*	*50-140*			
Volatiles									
Acetone	12.3	0.50	ug/g		123	50-140			
Benzene	3.84	0.02	ug/g		96.0	60-130			
Bromodichloromethane	4.09	0.05	ug/g		102	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	4.56	0.05	ug/g		114	60-130			
Bromomethane	3.47	0.05	ug/g		86.6	50-140			
Carbon Tetrachloride	3.87	0.05	ug/g		96.7	60-130			
Chlorobenzene	3.52	0.05	ug/g		88.1	60-130			
Chloroform	3.29	0.05	ug/g		82.3	60-130			
Dibromochloromethane	4.82	0.05	ug/g		120	60-130			
Dichlorodifluoromethane	5.13	0.05	ug/g		128	50-140			
1,2-Dichlorobenzene	2.89	0.05	ug/g		72.2	60-130			
1,3-Dichlorobenzene	3.31	0.05	ug/g		82.7	60-130			
1,4-Dichlorobenzene	3.16	0.05	ug/g		79.0	60-130			
1,1-Dichloroethane	4.94	0.05	ug/g		124	60-130			
1,2-Dichloroethane	4.11	0.05	ug/g		103	60-130			
1,1-Dichloroethylene	4.71	0.05	ug/g		118	60-130			
cis-1,2-Dichloroethylene	4.07	0.05	ug/g		102	60-130			
trans-1,2-Dichloroethylene	4.10	0.05	ug/g		102	60-130			
1,2-Dichloropropane	4.23	0.05	ug/g		106	60-130			
cis-1,3-Dichloropropylene	3.50	0.05	ug/g		87.6	60-130			
trans-1,3-Dichloropropylene	2.76	0.05	ug/g		69.1	60-130			
Ethylbenzene	3.74	0.05	ug/g		93.6	60-130			
Ethylene dibromide (dibromoethane	4.33	0.05	ug/g		108	60-130			
Hexane	3.44	0.05	ug/g		85.9	60-130			
Methyl Ethyl Ketone (2-Butanone)	9.22	0.50	ug/g		92.2	50-140			
Methyl Isobutyl Ketone	9.70	0.50	ug/g		97.0	50-140			
Methyl tert-butyl ether	8.21	0.05	ug/g		82.1	50-140			
Methylene Chloride	3.71	0.05	ug/g		92.7	60-130			
Styrene	3.47	0.05	ug/g		86.8	60-130			
1,1,1,2-Tetrachloroethane	4.80	0.05	ug/g		120	60-130			
1,1,2,2-Tetrachloroethane	2.53	0.05	ug/g		63.3	60-130			
Tetrachloroethylene	4.30	0.05	ug/g		107	60-130			
Toluene	3.65	0.05	ug/g		91.2	60-130			
1,1,1-Trichloroethane	3.81	0.05	ug/g		95.2	60-130			
1,1,2-Trichloroethane	4.00	0.05	ug/g		100	60-130			
Trichloroethylene	4.90	0.05	ug/g		122	60-130			
Trichlorofluoromethane	3.72	0.05	ug/g		93.1	50-140			
Vinyl chloride	4.47	0.02	ug/g		112	50-140			
m,p-Xylenes	7.40	0.05	ug/g		92.5	60-130			
o-Xylene	3.94	0.05	ug/g		98.6	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : GC-FID signal did not return to baseline by C50

5 : The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.

QC Qualifiers :

QM-06 : Due to noted non-homogeneity of the QC sample matrix, the spike recoveries were out side the accepted range. Batch data accepted based on other QC.

QR-04 : Duplicate results exceeds RPD limits due to non-homogeneous matrix.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

Paracel ID: 1912587

PARACEL LABORATORIES LTD. | TRUST RESP(RELIABLE .

Blvd. 4J8 ...os.com

Chain of Custody
(Lab Use Only)
№ 46537

Page __ of __

Client Name: DST Group	Project Reference: TS80-37029
Contact Name: Shahab Nowruzi	Quote #
Address:	PO #
Telephone: 613-295-5622	Email Address: snowruzi@dstgroup.com

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: ______

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☒ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ______ ☐ Other: ______

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:
1912587-Bulk
1912588-TCLP

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	BTEX	PAHs	VOCs	PHCs	METALS including:	Mercury Chrom. 6	Lead	TCLP Leached fill			
1	BH19-4 SS2	S			21-March-2019	AM	X	X	X	X	X	X	X				
2	BH19-7 SS4	S			↓	AM	X	X	X	X	X	X	X				
3	BH19-12 SS2	S				PM	X	X	X	X	X	X	X				
4	BH19-13, SS2	S				↓	X	X	X	X	X	X	X				
5	BH19-14 GS1	S					X	X	X	X	X	X	X				
6	BH19-15, GS1	S			↓	↓	X	X	X	X	X	XX	X				
7	BH19-12/13 GS1	S			21-March 2019	PM.	X	X	X	X				X			
8																	
9																	
10																	

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: [signature]	Verified By: [signature]
Relinquished By (Print): Shahab Nowruzi	Date/Time:	Date/Time: Mar 21/19 4:32p	Date/Time: Mar 21/19 4:52p
Date/Time: March 21, 2019 @ 1635	Temperature: ___ °C	Temperature: 18.3 °C	pH Verified [ ] By: NA

Chain of Custody (Blank) - Rev 0.4 Feb 2016 HR

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Shahab Nowrozi

Client PO:
Project: TS SO 37029
Custody: 46534

Report Date: 22-Mar-2019
Order Date: 18-Mar-2019

Order #: 1912128

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

Paracel ID	Client ID
1912128-01	BH19-10 SS2
1912128-02	BH19-9 SS4
1912128-03	BH19-8 SS4

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 18-Mar-2019
Project Description: TS SO 37029

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	19-Mar-19	19-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	21-Mar-19	21-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	19-Mar-19	20-Mar-19
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	21-Mar-19	21-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	19-Mar-19	19-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	20-Mar-19	20-Mar-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	19-Mar-19	20-Mar-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	19-Mar-19	20-Mar-19
Solids, %	Gravimetric, calculation	21-Mar-19	21-Mar-19

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 18-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-10 SS2	BH19-9 SS4	BH19-8 SS4	-
	Sample Date:	03/18/2019 00:00	03/18/2019 00:00	03/18/2019 00:00	-
	Sample ID:	1912128-01	1912128-02	1912128-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	90.0	72.8	85.4	-
Metals					
Antimony	1.0 ug/g dry	2.1	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	7.4	3.5	2.9	-
Barium	1.0 ug/g dry	114	328	105	-
Beryllium	0.5 ug/g dry	<0.5	0.9	0.6	-
Boron	5.0 ug/g dry	24.6	6.8	11.6	-
Cadmium	0.5 ug/g dry	1.6	<0.5	<0.5	-
Chromium	5.0 ug/g dry	47.3	91.6	50.2	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	-
Cobalt	1.0 ug/g dry	8.8	20.3	10.1	-
Copper	5.0 ug/g dry	323	49.1	22.7	-
Lead	1.0 ug/g dry	135	12.5	8.5	-
Mercury	0.1 ug/g dry	1.6	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	9.3	<1.0	<1.0	-
Nickel	5.0 ug/g dry	48.7	47.9	25.7	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	1.5	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	26.0	98.7	51.3	-
Zinc	20.0 ug/g dry	579	176	78.7	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 18-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-10 SS2	BH19-9 SS4	BH19-8 SS4	-
	Sample Date:	03/18/2019 00:00	03/18/2019 00:00	03/18/2019 00:00	-
	Sample ID:	1912128-01	1912128-02	1912128-03	-
	MDL/Units	Soil	Soil	Soil	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Ethylbenzene	0.05 ug/g dry	0.16	<0.05	<0.05	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Hexane	0.05 ug/g dry	0.13	<0.05	<0.05	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	1.74	-
Toluene	0.05 ug/g dry	0.14	<0.05	<0.05	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	-
m,p-Xylenes	0.05 ug/g dry	0.33	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	0.22	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	0.55	<0.05	<0.05	-
4-Bromofluorobenzene	Surrogate	99.5%	111%	110%	-
Dibromofluoromethane	Surrogate	98.1%	90.3%	87.4%	-
Toluene-d8	Surrogate	120%	115%	116%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	96	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	265	<4	<4	-

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 18-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-10 SS2	BH19-9 SS4	BH19-8 SS4	-
	Sample Date:	03/18/2019 00:00	03/18/2019 00:00	03/18/2019 00:00	-
	Sample ID:	1912128-01	1912128-02	1912128-03	-
	MDL/Units	Soil	Soil	Soil	-
F3 PHCs (C16-C34)	8 ug/g dry	1630	44	<8	-
F4 PHCs (C34-C50)	6 ug/g dry	1230 [1]	21	<6	-
F4G PHCs (gravimetric)	50 ug/g dry	2700	-	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	0.04	<0.02	<0.02	-
Acenaphthylene	0.02 ug/g dry	0.03	<0.02	<0.02	-
Anthracene	0.02 ug/g dry	0.09	<0.02	<0.02	-
Benzo [a] anthracene	0.02 ug/g dry	0.18	<0.02	<0.02	-
Benzo [a] pyrene	0.02 ug/g dry	0.14	<0.02	<0.02	-
Benzo [b] fluoranthene	0.02 ug/g dry	0.29	<0.02	<0.02	-
Benzo [g,h,i] perylene	0.02 ug/g dry	0.11	<0.02	<0.02	-
Benzo [k] fluoranthene	0.02 ug/g dry	0.13	<0.02	<0.02	-
Chrysene	0.02 ug/g dry	0.18	<0.02	<0.02	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	0.02	<0.02	<0.02	-
Fluoranthene	0.02 ug/g dry	0.46	0.02	<0.02	-
Fluorene	0.02 ug/g dry	0.07	<0.02	<0.02	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	0.09	<0.02	<0.02	-
1-Methylnaphthalene	0.02 ug/g dry	0.09	<0.02	<0.02	-
2-Methylnaphthalene	0.02 ug/g dry	0.13	<0.02	<0.02	-
Methylnaphthalene (1&2)	0.04 ug/g dry	0.22	<0.04	<0.04	-
Naphthalene	0.01 ug/g dry	0.09	<0.01	<0.01	-
Phenanthrene	0.02 ug/g dry	0.24	<0.02	<0.02	-
Pyrene	0.02 ug/g dry	0.46	0.03	<0.02	-
2-Fluorobiphenyl	Surrogate	92.5%	102%	88.4%	-
Terphenyl-d14	Surrogate	85.7%	98.4%	106%	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	1.1	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.48*		*ug/g*		*111*	*50-140*			
Surrogate: Terphenyl-d14	*1.62*		*ug/g*		*122*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*8.88*		*ug/g*		*111*	*50-140*			
Surrogate: Dibromofluoromethane	*6.86*		*ug/g*		*85.8*	*50-140*			
Surrogate: Toluene-d8	*8.27*		*ug/g*		*103*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	288	4	ug/g dry	265			8.4	30	
F3 PHCs (C16-C34)	1780	8	ug/g dry	1630			9.4	30	
F4 PHCs (C34-C50)	965	6	ug/g dry	1230			24.1	30	
F4G PHCs (gravimetric)	3390	50	ug/g dry	2700			22.6	30	
Metals									
Antimony	1.2	1.0	ug/g dry	ND			0.0	30	
Arsenic	7.4	1.0	ug/g dry	8.0			7.9	30	
Barium	79.9	1.0	ug/g dry	91.0			12.9	30	
Beryllium	0.8	0.5	ug/g dry	0.8			10.1	30	
Boron	12.2	5.0	ug/g dry	13.4			9.4	30	
Cadmium	ND	0.5	ug/g dry	0.6			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	19.6	5.0	ug/g dry	21.6			9.6	30	
Cobalt	8.2	1.0	ug/g dry	9.1			11.1	30	
Copper	16.4	5.0	ug/g dry	17.9			8.2	30	
Lead	11.1	1.0	ug/g dry	11.9			7.0	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	2.6	1.0	ug/g dry	ND			0.0	30	
Nickel	20.7	5.0	ug/g dry	23.2			11.5	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	0.4			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	1.1	1.0	ug/g dry	1.3			18.2	30	
Vanadium	29.6	10.0	ug/g dry	32.4			9.1	30	
Zinc	54.8	20.0	ug/g dry	60.1			9.1	30	
Physical Characteristics									
% Solids	93.8	0.1	% by Wt.	94.1			0.3	25	
Semi-Volatiles									
Acenaphthene	0.043	0.02	ug/g dry	0.043			0.6	40	
Acenaphthylene	0.031	0.02	ug/g dry	0.035			11.1	40	
Anthracene	0.076	0.02	ug/g dry	0.092			19.6	40	
Benzo [a] anthracene	0.162	0.02	ug/g dry	0.182			11.3	40	
Benzo [a] pyrene	0.128	0.02	ug/g dry	0.144			11.8	40	
Benzo [b] fluoranthene	0.217	0.02	ug/g dry	0.291			29.3	40	
Benzo [g,h,i] perylene	0.108	0.02	ug/g dry	0.110			2.1	40	
Benzo [k] fluoranthene	0.098	0.02	ug/g dry	0.129			26.7	40	
Chrysene	0.168	0.02	ug/g dry	0.181			7.7	40	
Dibenzo [a,h] anthracene	0.027	0.02	ug/g dry	0.021			23.6	40	
Fluoranthene	0.415	0.02	ug/g dry	0.460			10.4	40	
Fluorene	0.067	0.02	ug/g dry	0.067			1.2	40	
Indeno [1,2,3-cd] pyrene	0.076	0.02	ug/g dry	0.089			15.0	40	
1-Methylnaphthalene	0.095	0.02	ug/g dry	0.091			4.0	40	
2-Methylnaphthalene	0.139	0.02	ug/g dry	0.133			4.8	40	
Naphthalene	0.102	0.01	ug/g dry	0.090			11.8	40	
Phenanthrene	0.228	0.02	ug/g dry	0.244			7.1	40	
Pyrene	0.432	0.02	ug/g dry	0.459			6.1	40	
Surrogate: 2-Fluorobiphenyl	*1.49*		*ug/g dry*		*100*	*50-140*			
Surrogate: Terphenyl-d14	*1.47*		*ug/g dry*		*99.5*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: 4-Bromofluorobenzene	*10.2*		*ug/g dry*		*112*	*50-140*			
Surrogate: Dibromofluoromethane	*8.78*		*ug/g dry*		*96.3*	*50-140*			
Surrogate: Toluene-d8	*9.97*		*ug/g dry*		*109*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	187	7	ug/g		93.4	80-120			
F2 PHCs (C10-C16)	369	4	ug/g	265	117	60-140			
F3 PHCs (C16-C34)	215	8	ug/g		110	80-120			
F4 PHCs (C34-C50)	125	6	ug/g		100	80-120			
F4G PHCs (gravimetric)	940	50	ug/g		94.0	80-120			
Metals									
Antimony	43.5		ug/L	ND	87.0	70-130			
Arsenic	50.4		ug/L	3.2	94.4	70-130			
Barium	80.9		ug/L	36.4	89.0	70-130			
Beryllium	51.2		ug/L	ND	102	70-130			
Boron	49.5		ug/L	5.4	88.3	70-130			
Cadmium	45.1		ug/L	ND	89.8	70-130			
Chromium (VI)	3.8	0.2	ug/g		75.0	70-130			
Chromium	53.7		ug/L	8.6	90.1	70-130			
Cobalt	48.8		ug/L	3.7	90.3	70-130			
Copper	49.7		ug/L	7.1	85.0	70-130			
Lead	46.6		ug/L	4.8	83.7	70-130			
Mercury	1.60	0.1	ug/g	ND	107	70-130			
Molybdenum	48.1		ug/L	ND	96.2	70-130			
Nickel	56.4		ug/L	9.3	94.3	70-130			
Selenium	45.8		ug/L	ND	91.0	70-130			
Silver	42.5		ug/L	ND	84.7	70-130			
Thallium	42.7		ug/L	ND	84.9	70-130			
Uranium	43.3		ug/L	ND	85.5	70-130			
Vanadium	61.8		ug/L	13.0	97.7	70-130			
Zinc	67.2		ug/L	24.0	86.3	70-130			
Semi-Volatiles									
Acenaphthene	0.238	0.02	ug/g	0.043	105	50-140			
Acenaphthylene	0.201	0.02	ug/g	0.035	89.5	50-140			
Anthracene	0.276	0.02	ug/g	0.092	99.3	50-140			
Benzo [a] anthracene	0.348	0.02	ug/g	0.182	89.7	50-140			
Benzo [a] pyrene	0.274	0.02	ug/g	0.144	70.4	50-140			
Benzo [b] fluoranthene	0.489	0.02	ug/g	0.291	107	50-140			
Benzo [g,h,i] perylene	0.249	0.02	ug/g	0.110	75.1	50-140			
Benzo [k] fluoranthene	0.377	0.02	ug/g	0.129	134	50-140			
Chrysene	0.335	0.02	ug/g	0.181	83.3	50-140			
Dibenzo [a,h] anthracene	0.168	0.02	ug/g	0.021	79.1	50-140			
Fluoranthene	0.638	0.02	ug/g	0.460	95.9	50-140			
Fluorene	0.251	0.02	ug/g	0.067	99.4	50-140			
Indeno [1,2,3-cd] pyrene	0.211	0.02	ug/g	0.089	66.2	50-140			
1-Methylnaphthalene	0.305	0.02	ug/g	0.091	115	50-140			
2-Methylnaphthalene	0.329	0.02	ug/g	0.133	106	50-140			
Naphthalene	0.335	0.01	ug/g	0.090	132	50-140			
Phenanthrene	0.431	0.02	ug/g	0.244	101	50-140			
Pyrene	0.644	0.02	ug/g	0.459	99.7	50-140			
Surrogate: 2-Fluorobiphenyl	*1.42*		*ug/g*		*96.2*	*50-140*			
Volatiles									
Acetone	9.73	0.50	ug/g		97.3	50-140			
Benzene	4.32	0.02	ug/g		108	60-130			
Bromodichloromethane	4.01	0.05	ug/g		100	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	3.64	0.05	ug/g		91.1	60-130			
Bromomethane	2.79	0.05	ug/g		69.8	50-140			
Carbon Tetrachloride	3.71	0.05	ug/g		92.6	60-130			
Chlorobenzene	3.37	0.05	ug/g		84.2	60-130			
Chloroform	4.74	0.05	ug/g		118	60-130			
Dibromochloromethane	3.63	0.05	ug/g		90.8	60-130			
Dichlorodifluoromethane	2.98	0.05	ug/g		74.4	50-140			
1,2-Dichlorobenzene	3.68	0.05	ug/g		92.1	60-130			
1,3-Dichlorobenzene	3.62	0.05	ug/g		90.6	60-130			
1,4-Dichlorobenzene	3.55	0.05	ug/g		88.8	60-130			
1,1-Dichloroethane	4.60	0.05	ug/g		115	60-130			
1,2-Dichloroethane	4.21	0.05	ug/g		105	60-130			
1,1-Dichloroethylene	3.84	0.05	ug/g		96.1	60-130			
cis-1,2-Dichloroethylene	4.87	0.05	ug/g		122	60-130			
trans-1,2-Dichloroethylene	4.20	0.05	ug/g		105	60-130			
1,2-Dichloropropane	4.75	0.05	ug/g		119	60-130			
cis-1,3-Dichloropropylene	4.46	0.05	ug/g		111	60-130			
trans-1,3-Dichloropropylene	4.08	0.05	ug/g		102	60-130			
Ethylbenzene	3.46	0.05	ug/g		86.4	60-130			
Ethylene dibromide (dibromoethane	3.95	0.05	ug/g		98.7	60-130			
Hexane	2.71	0.05	ug/g		67.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	10.8	0.50	ug/g		108	50-140			
Methyl Isobutyl Ketone	11.7	0.50	ug/g		117	50-140			
Methyl tert-butyl ether	12.8	0.05	ug/g		128	50-140			
Methylene Chloride	3.91	0.05	ug/g		97.8	60-130			
Styrene	3.72	0.05	ug/g		93.0	60-130			
1,1,1,2-Tetrachloroethane	3.49	0.05	ug/g		87.3	60-130			
1,1,2,2-Tetrachloroethane	3.89	0.05	ug/g		97.3	60-130			
Tetrachloroethylene	3.51	0.05	ug/g		87.8	60-130			
Toluene	3.23	0.05	ug/g		80.6	60-130			
1,1,1-Trichloroethane	4.54	0.05	ug/g		114	60-130			
1,1,2-Trichloroethane	4.60	0.05	ug/g		115	60-130			
Trichloroethylene	4.52	0.05	ug/g		113	60-130			
Trichlorofluoromethane	3.56	0.05	ug/g		88.9	50-140			
Vinyl chloride	2.68	0.02	ug/g		66.9	50-140			
m,p-Xylenes	6.84	0.05	ug/g		85.5	60-130			
o-Xylene	3.47	0.05	ug/g		86.8	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : GC-FID signal did not return to baseline by C50

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

PARACEL LABORATORIES LTD.

TRI
RE:
REI

Paracel ID: 1912128

urent Blvd.
K1G 4J8
947
acellabs.com

Chain of Custody
(Lab Use Only)
№ 46534

Page 1 of 1

Client Name: DST Group	Project Reference: TSSO-37029	**Turnaround Time:**
Contact Name: Shahab Nuroozi / Cameron Fischl	Quote #	☐ 1 Day ☐ 3 Day
Address: 203-2150 Thurston Drive Ottawa, ON	PO #	☐ 2 Day ☒ Regular
Telephone: 613-295-5622 / 613-402-0398	Email Address: snuroozi@dstgroup.com cfischl@dstgroup.com	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 1912128

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	BTEX	PAHs	VOCs	Metals	PHC F1-F4	Including Mercury	Chrome 6 and lead				
1	BH19-10 SS2	S		2	2019/03/18		X	X	X	X	X	X	X	250 ml (1 Vial)			
2	BH19-9 SS4	S		2	↓		X	X	X	X	X	X	X		↓		
3	BH19-8 SS4	S		2			X	X	X	X	X	X	X				
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments:

Method of Delivery: Courier

Relinquished By (Sign): Cam Fischl	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Cameron Fischl	Date/Time:	Date/Time: 19/03/19 9:27	Date/Time: 3/18/19 16:48
Date/Time: 2019/03/18 4:27 pm	Temperature: ____ °C	Temperature: 15.9 °C	pH Verified [ ] By:

Chain of Custody (Blank) - Rev 0.4 Feb 2016

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Shahab Nowrozi

Client PO:
Project: TS SO 37029
Custody: 47493

Report Date: 22-Mar-2019
Order Date: 19-Mar-2019

Order #: 1912273

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

Paracel ID	Client ID
1912273-01	BH19-1 SS#5
1912273-02	BH19-3 SS#2
1912273-03	BH19-2 SS#2
1912273-04	BH19-6 SS#2

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 19-Mar-2019
Project Description: TS SO 37029

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	19-Mar-19	21-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	22-Mar-19	22-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	20-Mar-19	21-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	19-Mar-19	21-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	21-Mar-19	21-Mar-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	20-Mar-19	21-Mar-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	20-Mar-19	21-Mar-19
Solids, %	Gravimetric, calculation	21-Mar-19	21-Mar-19

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 22-Mar-2019

Order Date: 19-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-1 SS#5	BH19-3 SS#2	BH19-2 SS#2	BH19-6 SS#2
	Sample Date:	03/19/2019 12:00	03/19/2019 12:00	03/19/2019 09:00	03/19/2019 09:00
	Sample ID:	1912273-01	1912273-02	1912273-03	1912273-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	77.9	82.6	79.1	78.5
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	8.8
Arsenic	1.0 ug/g dry	1.7	2.7	4.5	12.9
Barium	1.0 ug/g dry	150	161	239	490
Beryllium	0.5 ug/g dry	<0.5	0.6	0.9	<0.5
Boron	5.0 ug/g dry	5.3	6.2	11.4	26.4
Cadmium	0.5 ug/g dry	<0.5	<0.5	1.2	8.6
Chromium	5.0 ug/g dry	31.0	43.5	64.8	69.0
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	7.8	11.3	17.0	13.7
Copper	5.0 ug/g dry	16.9	23.9	59.3	249
Lead	1.0 ug/g dry	4.4	7.2	24.3	485
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	1.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	4.3	9.5
Nickel	5.0 ug/g dry	16.2	24.3	35.4	226
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	1.1	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	45.6	54.8	68.7	44.2
Zinc	20.0 ug/g dry	44.3	69.0	165	4140
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Benzene	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromoform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Bromomethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Chloroform	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 19-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-1 SS#5	BH19-3 SS#2	BH19-2 SS#2	BH19-6 SS#2
	Sample Date:	03/19/2019 12:00	03/19/2019 12:00	03/19/2019 09:00	03/19/2019 09:00
	Sample ID:	1912273-01	1912273-02	1912273-03	1912273-04
	MDL/Units	Soil	Soil	Soil	Soil
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Hexane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	<0.50	<0.50
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Styrene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	0.05 ug/g dry	<0.05	0.10	0.68	0.21
Toluene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	<0.05	0.21
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	<0.02	<0.02
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
o-Xylene	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	<0.05	<0.05
4-Bromofluorobenzene	Surrogate	115%	114%	109%	115%
Dibromofluoromethane	Surrogate	102%	102%	106%	98.2%
Toluene-d8	Surrogate	114%	107%	105%	115%
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	<7	<7
F2 PHCs (C10-C16)	4 ug/g dry	<4	<4	<4	<40 [1]

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 19-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-1 SS#5	BH19-3 SS#2	BH19-2 SS#2	BH19-6 SS#2
	Sample Date:	03/19/2019 12:00	03/19/2019 12:00	03/19/2019 09:00	03/19/2019 09:00
	Sample ID:	1912273-01	1912273-02	1912273-03	1912273-04
	MDL/Units	Soil	Soil	Soil	Soil
F3 PHCs (C16-C34)	8 ug/g dry	<8	<8	28	1020
F4 PHCs (C34-C50)	6 ug/g dry	<6	<6	<6	67
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.03
Acenaphthylene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.03
Anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.10
Benzo [a] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.19
Benzo [a] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.19
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.36
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.29
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.16
Chrysene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.18
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.03
Fluoranthene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.39
Fluorene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.03
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.16
1-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.02
2-Methylnaphthalene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.04
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	<0.04	<0.04	0.06
Naphthalene	0.01 ug/g dry	<0.01	<0.01	<0.01	0.05
Phenanthrene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.33
Pyrene	0.02 ug/g dry	<0.02	<0.02	<0.02	0.36
2-Fluorobiphenyl	Surrogate	74.8%	76.4%	69.6%	74.6%
Terphenyl-d14	Surrogate	110%	100%	84.6%	84.4%

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.08*		*ug/g*		*80.7*	*50-140*			
Surrogate: Terphenyl-d14	*1.34*		*ug/g*		*101*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						
Dichlorodifluoromethane	ND	0.05	ug/g						

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 22-Mar-2019
Order Date: 19-Mar-2019
Project Description: TS SO 37029

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*9.12*		*ug/g*		*114*	*50-140*			
Surrogate: Dibromofluoromethane	*7.38*		*ug/g*		*92.2*	*50-140*			
Surrogate: Toluene-d8	*8.07*		*ug/g*		*101*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	6	4	ug/g dry	5			9.2	30	
F3 PHCs (C16-C34)	14	8	ug/g dry	17			17.6	30	
F4 PHCs (C34-C50)	7	6	ug/g dry	14			66.5	30	QR-01
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	4.0	1.0	ug/g dry	3.9			1.9	30	
Barium	65.1	1.0	ug/g dry	66.4			2.0	30	
Beryllium	0.7	0.5	ug/g dry	0.8			3.3	30	
Boron	12.6	5.0	ug/g dry	11.6			8.2	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	23.4	5.0	ug/g dry	23.3			0.4	30	
Cobalt	10.0	1.0	ug/g dry	10.1			1.0	30	
Copper	31.2	5.0	ug/g dry	31.3			0.2	30	
Lead	10.9	1.0	ug/g dry	10.8			0.5	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	23.6	5.0	ug/g dry	24.1			1.9	30	
Selenium	1.3	1.0	ug/g dry	1.3			0.8	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	30.1	10.0	ug/g dry	30.5			1.2	30	
Zinc	62.8	20.0	ug/g dry	62.7			0.1	30	
Physical Characteristics									
% Solids	85.8	0.1	% by Wt.	86.0			0.2	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND				40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND				40	
Pyrene	ND	0.02	ug/g dry	ND				40	
Surrogate: 2-Fluorobiphenyl	*1.51*		*ug/g dry*		*88.2*	*50-140*			
Surrogate: Terphenyl-d14	*2.15*		*ug/g dry*		*126*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND			0.0	50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	
Chlorobenzene	ND	0.05	ug/g dry	ND			0.0	50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chloroform	ND	0.05	ug/g dry	ND			0.0	50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND			0.0	50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND			0.0	50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND			0.0	50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND			0.0	50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND			0.0	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND			0.0	50	
Trichloroethylene	ND	0.05	ug/g dry	ND				50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND			0.0	50	
m,p-Xylenes	ND	0.05	ug/g dry	ND			0.0	50	
o-Xylene	ND	0.05	ug/g dry	ND			0.0	50	
Surrogate: 4-Bromofluorobenzene	*10.7*		*ug/g dry*		*57.3*	*50-140*			
Surrogate: Dibromofluoromethane	*11.6*		*ug/g dry*		*62.0*	*50-140*			
Surrogate: Toluene-d8	*13.0*		*ug/g dry*		*69.5*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	178	7	ug/g		88.9	80-120			
F2 PHCs (C10-C16)	117	4	ug/g	5	119	60-140			
F3 PHCs (C16-C34)	321	8	ug/g	17	132	60-140			
F4 PHCs (C34-C50)	207	6	ug/g	14	132	60-140			
Metals									
Antimony	41.8		ug/L	ND	82.9	70-130			
Arsenic	47.1		ug/L	1.6	91.1	70-130			
Barium	70.1		ug/L	26.6	87.0	70-130			
Beryllium	49.6		ug/L	ND	98.6	70-130			
Boron	48.0		ug/L	ND	86.7	70-130			
Cadmium	43.2		ug/L	ND	86.3	70-130			
Chromium (VI)	0.2		mg/L	ND	78.0	70-130			
Chromium	52.9		ug/L	9.3	87.1	70-130			
Cobalt	47.0		ug/L	4.0	86.0	70-130			
Copper	52.8		ug/L	12.5	80.6	70-130			
Lead	46.4		ug/L	4.3	84.1	70-130			
Mercury	1.60	0.1	ug/g	ND	107	70-130			
Molybdenum	45.7		ug/L	ND	90.9	70-130			
Nickel	56.0		ug/L	9.6	92.7	70-130			
Selenium	44.6		ug/L	ND	88.1	70-130			
Silver	41.9		ug/L	ND	83.7	70-130			
Thallium	41.7		ug/L	ND	83.2	70-130			
Uranium	43.4		ug/L	ND	86.4	70-130			
Vanadium	60.7		ug/L	12.2	96.9	70-130			
Zinc	67.2		ug/L	25.1	84.3	70-130			
Semi-Volatiles									
Acenaphthene	0.267	0.02	ug/g	ND	125	50-140			
Acenaphthylene	0.220	0.02	ug/g	ND	103	50-140			
Anthracene	0.227	0.02	ug/g	ND	106	50-140			
Benzo [a] anthracene	0.225	0.02	ug/g	ND	105	50-140			
Benzo [a] pyrene	0.190	0.02	ug/g	ND	88.6	50-140			
Benzo [b] fluoranthene	0.259	0.02	ug/g	ND	121	50-140			
Benzo [g,h,i] perylene	0.194	0.02	ug/g	ND	90.8	50-140			
Benzo [k] fluoranthene	0.251	0.02	ug/g	ND	117	50-140			
Chrysene	0.217	0.02	ug/g	ND	102	50-140			
Dibenzo [a,h] anthracene	0.182	0.02	ug/g	ND	85.2	50-140			
Fluoranthene	0.236	0.02	ug/g	ND	110	50-140			
Fluorene	0.223	0.02	ug/g	ND	104	50-140			
Indeno [1,2,3-cd] pyrene	0.189	0.02	ug/g	ND	88.3	50-140			
1-Methylnaphthalene	0.178	0.02	ug/g	ND	83.4	50-140			
2-Methylnaphthalene	0.206	0.02	ug/g	ND	96.3	50-140			
Naphthalene	0.236	0.01	ug/g	ND	110	50-140			
Phenanthrene	0.231	0.02	ug/g	ND	108	50-140			
Pyrene	0.227	0.02	ug/g	ND	106	50-140			
Surrogate: 2-Fluorobiphenyl	*1.39*		*ug/g*		*81.0*	*50-140*			
Volatiles									
Acetone	7.70	0.50	ug/g		77.0	50-140			
Benzene	4.55	0.02	ug/g		114	60-130			
Bromodichloromethane	4.19	0.05	ug/g		105	60-130			
Bromoform	4.70	0.05	ug/g		117	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromomethane	2.78	0.05	ug/g		69.4	50-140			
Carbon Tetrachloride	4.14	0.05	ug/g		104	60-130			
Chlorobenzene	4.68	0.05	ug/g		117	60-130			
Chloroform	4.72	0.05	ug/g		118	60-130			
Dibromochloromethane	3.87	0.05	ug/g		96.7	60-130			
Dichlorodifluoromethane	3.67	0.05	ug/g		91.8	50-140			
1,2-Dichlorobenzene	4.66	0.05	ug/g		117	60-130			
1,3-Dichlorobenzene	4.70	0.05	ug/g		118	60-130			
1,4-Dichlorobenzene	4.74	0.05	ug/g		118	60-130			
1,1-Dichloroethane	4.88	0.05	ug/g		122	60-130			
1,2-Dichloroethane	4.24	0.05	ug/g		106	60-130			
1,1-Dichloroethylene	3.99	0.05	ug/g		99.7	60-130			
cis-1,2-Dichloroethylene	4.71	0.05	ug/g		118	60-130			
trans-1,2-Dichloroethylene	4.63	0.05	ug/g		116	60-130			
1,2-Dichloropropane	4.67	0.05	ug/g		117	60-130			
cis-1,3-Dichloropropylene	4.05	0.05	ug/g		101	60-130			
trans-1,3-Dichloropropylene	4.93	0.05	ug/g		123	60-130			
Ethylbenzene	4.87	0.05	ug/g		122	60-130			
Ethylene dibromide (dibromoethane	4.13	0.05	ug/g		103	60-130			
Hexane	3.49	0.05	ug/g		87.2	60-130			
Methyl Ethyl Ketone (2-Butanone)	11.8	0.50	ug/g		118	50-140			
Methyl Isobutyl Ketone	10.4	0.50	ug/g		104	50-140			
Methyl tert-butyl ether	12.0	0.05	ug/g		120	50-140			
Methylene Chloride	4.37	0.05	ug/g		109	60-130			
Styrene	4.71	0.05	ug/g		118	60-130			
1,1,1,2-Tetrachloroethane	4.81	0.05	ug/g		120	60-130			
1,1,2,2-Tetrachloroethane	4.45	0.05	ug/g		111	60-130			
Tetrachloroethylene	4.97	0.05	ug/g		124	60-130			
Toluene	3.88	0.05	ug/g		97.0	60-130			
1,1,1-Trichloroethane	4.72	0.05	ug/g		118	60-130			
1,1,2-Trichloroethane	4.03	0.05	ug/g		101	60-130			
Trichloroethylene	3.96	0.05	ug/g		98.9	60-130			
Trichlorofluoromethane	3.66	0.05	ug/g		91.4	50-140			
Vinyl chloride	3.51	0.02	ug/g		87.7	50-140			
m,p-Xylenes	9.79	0.05	ug/g		122	60-130			
o-Xylene	4.85	0.05	ug/g		121	60-130			

Qualifier Notes:

Sample Qualifiers :

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

QC Qualifiers :

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

PARACEL LABORATORIES LTD. | TRUS RESF RELI

Paracel ID: 1912273

ent Blvd.
1G 4J8

llabs.com

Chain of Custody
(Lab Use Only)

№ 47492

Page 1 of 1

Client Name: DST Group	Project Reference: TSSO-37029	**Turnaround Time:**	
Contact Name: Shahab Nowrozi / Cameron F.	Quote #	☐ 1 Day	☐ 3 Day
Address: 203-2150 Thurston Drive	PO #	☐ 2 Day	☒ Regular
Telephone: 613-295-5622	Email Address: snowrozi@dstgroup.com cfischl@" "	Date Required:	

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

Matrix Type: S (Soil Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: 1912273 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	BTEX	PAHs	PCBs	Metals (Includes Mercury, Chromium, and Lead)		PHCs F1-F4				
1	BH19-1 SS#5	S		2	March 19/19	PM	X	X	X	X	X	X	X			
2	BH19-3 SS# 2	S		2	"	PM	X	X	X	X	X	X	X			
3	BH19-2 SS#2	S		2	"	AM	X	X	X	X	X	X	X			
4	BH19-6 SS#2	S		2	"	AM	X	X	X	X	X	X	X			
5																
6																
7																
8																
9																
10																

Comments:

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Kim Stewart	Verified By:
Relinquished By (Print): Shahab NOWROZI	Date/Time:	Date/Time: 19 March 19 16:12	Date/Time: 9/19/19 16:20
Date/Time: 2019/3/19 @ 16:12 HR	Temperature: °C	Temperature: 15.1 °C	pH Verified [ ] By:

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Shahab Nowrozi

Client PO:
Project: TS SO 37029
Custody: 47493

Report Date: 26-Mar-2019
Order Date: 20-Mar-2019

Order #: 1912428

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

Paracel ID	Client ID
1912428-01	BH19-5 SS1
1912428-02	BH19-11B SS3

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 20-Mar-2019
Project Description: TS SO 37029

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	21-Mar-19	25-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	22-Mar-19	22-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	22-Mar-19	24-Mar-19
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	22-Mar-19	22-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	21-Mar-19	21-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	22-Mar-19	22-Mar-19
REG 153: PAHs by GC-MS	EPA 8270 - GC-MS, extraction	23-Mar-19	23-Mar-19
REG 153: VOCs by P&T GC/MS	EPA 8260 - P&T GC-MS	22-Mar-19	24-Mar-19
Solids, %	Gravimetric, calculation	22-Mar-19	22-Mar-19

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 26-Mar-2019

Order Date: 20-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-5 SS1	BH19-11B SS3	-	-
	Sample Date:	03/20/2019 12:00	03/20/2019 09:00	-	-
	Sample ID:	1912428-01	1912428-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	78.8	90.2	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	8.1	-	-
Arsenic	1.0 ug/g dry	3.2	9.7	-	-
Barium	1.0 ug/g dry	151	490	-	-
Beryllium	0.5 ug/g dry	0.7	<0.5	-	-
Boron	5.0 ug/g dry	9.6	31.1	-	-
Cadmium	0.5 ug/g dry	<0.5	5.2	-	-
Chromium	5.0 ug/g dry	53.3	62.7	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	-	-
Cobalt	1.0 ug/g dry	12.3	10.8	-	-
Copper	5.0 ug/g dry	17.1	477	-	-
Lead	1.0 ug/g dry	8.1	591	-	-
Mercury	0.1 ug/g dry	<0.1	1.4	-	-
Molybdenum	1.0 ug/g dry	<1.0	10.5	-	-
Nickel	5.0 ug/g dry	24.7	96.2	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.3 ug/g dry	<0.3	0.7	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	1.1	<1.0	-	-
Vanadium	10.0 ug/g dry	58.6	32.4	-	-
Zinc	20.0 ug/g dry	86.9	1850	-	-
Volatiles					
Acetone	0.50 ug/g dry	<0.50	<0.50	-	-
Benzene	0.02 ug/g dry	<0.02	<0.02	-	-
Bromodichloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Bromoform	0.05 ug/g dry	<0.05	<0.05	-	-
Bromomethane	0.05 ug/g dry	<0.05	<0.05	-	-
Carbon Tetrachloride	0.05 ug/g dry	<0.05	<0.05	-	-
Chlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Chloroform	0.05 ug/g dry	<0.05	<0.05	-	-
Dibromochloromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Dichlorodifluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 20-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-5 SS1	BH19-11B SS3	-	-
	Sample Date:	03/20/2019 12:00	03/20/2019 09:00	-	-
	Sample ID:	1912428-01	1912428-02	-	-
	MDL/Units	Soil	Soil	-	-
1,4-Dichlorobenzene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,2-Dichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,2-Dichloropropane	0.05 ug/g dry	<0.05	<0.05	-	-
cis-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
trans-1,3-Dichloropropylene	0.05 ug/g dry	<0.05	<0.05	-	-
1,3-Dichloropropene, total	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	<0.05	-	-
Ethylene dibromide (dibromoethan	0.05 ug/g dry	<0.05	<0.05	-	-
Hexane	0.05 ug/g dry	<0.05	<0.05	-	-
Methyl Ethyl Ketone (2-Butanone)	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl Isobutyl Ketone	0.50 ug/g dry	<0.50	<0.50	-	-
Methyl tert-butyl ether	0.05 ug/g dry	<0.05	<0.05	-	-
Methylene Chloride	0.05 ug/g dry	<0.05	<0.05	-	-
Styrene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2,2-Tetrachloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Tetrachloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Toluene	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,1-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
1,1,2-Trichloroethane	0.05 ug/g dry	<0.05	<0.05	-	-
Trichloroethylene	0.05 ug/g dry	<0.05	<0.05	-	-
Trichlorofluoromethane	0.05 ug/g dry	<0.05	<0.05	-	-
Vinyl chloride	0.02 ug/g dry	<0.02	<0.02	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	<0.05	-	-
o-Xylene	0.05 ug/g dry	<0.05	<0.05	-	-
Xylenes, total	0.05 ug/g dry	<0.05	<0.05	-	-
4-Bromofluorobenzene	Surrogate	93.6%	92.0%	-	-
Dibromofluoromethane	Surrogate	73.5%	75.7%	-	-
Toluene-d8	Surrogate	71.4%	71.0%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	<7	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	81	-	-

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 20-Mar-2019
Project Description: TS SO 37029

	Client ID:	BH19-5 SS1	BH19-11B SS3	-	-
	Sample Date:	03/20/2019 12:00	03/20/2019 09:00	-	-
	Sample ID:	1912428-01	1912428-02	-	-
	MDL/Units	Soil	Soil	-	-
F3 PHCs (C16-C34)	8 ug/g dry	22	1210	-	-
F4 PHCs (C34-C50)	6 ug/g dry	28	452 [1]	-	-
F4G PHCs (gravimetric)	50 ug/g dry	-	1410	-	-
Semi-Volatiles					
Acenaphthene	0.02 ug/g dry	<0.02	0.24	-	-
Acenaphthylene	0.02 ug/g dry	<0.02	0.08	-	-
Anthracene	0.02 ug/g dry	<0.02	0.60	-	-
Benzo [a] anthracene	0.02 ug/g dry	<0.02	1.01	-	-
Benzo [a] pyrene	0.02 ug/g dry	<0.02	0.76	-	-
Benzo [b] fluoranthene	0.02 ug/g dry	<0.02	0.90	-	-
Benzo [g,h,i] perylene	0.02 ug/g dry	<0.02	0.44	-	-
Benzo [k] fluoranthene	0.02 ug/g dry	<0.02	0.46	-	-
Chrysene	0.02 ug/g dry	<0.02	1.22	-	-
Dibenzo [a,h] anthracene	0.02 ug/g dry	<0.02	0.13	-	-
Fluoranthene	0.02 ug/g dry	<0.02	2.85	-	-
Fluorene	0.02 ug/g dry	<0.02	0.38	-	-
Indeno [1,2,3-cd] pyrene	0.02 ug/g dry	<0.02	0.35	-	-
1-Methylnaphthalene	0.02 ug/g dry	<0.02	0.17	-	-
2-Methylnaphthalene	0.02 ug/g dry	<0.02	0.18	-	-
Methylnaphthalene (1&2)	0.04 ug/g dry	<0.04	0.35	-	-
Naphthalene	0.01 ug/g dry	<0.01	0.30	-	-
Phenanthrene	0.02 ug/g dry	<0.02	2.29	-	-
Pyrene	0.02 ug/g dry	<0.02	2.87	-	-
2-Fluorobiphenyl	Surrogate	88.7%	72.2%	-	-
Terphenyl-d14	Surrogate	121%	66.3%	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g						
Acenaphthylene	ND	0.02	ug/g						
Anthracene	ND	0.02	ug/g						
Benzo [a] anthracene	ND	0.02	ug/g						
Benzo [a] pyrene	ND	0.02	ug/g						
Benzo [b] fluoranthene	ND	0.02	ug/g						
Benzo [g,h,i] perylene	ND	0.02	ug/g						
Benzo [k] fluoranthene	ND	0.02	ug/g						
Chrysene	ND	0.02	ug/g						
Dibenzo [a,h] anthracene	ND	0.02	ug/g						
Fluoranthene	ND	0.02	ug/g						
Fluorene	ND	0.02	ug/g						
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g						
1-Methylnaphthalene	ND	0.02	ug/g						
2-Methylnaphthalene	ND	0.02	ug/g						
Methylnaphthalene (1&2)	ND	0.04	ug/g						
Naphthalene	ND	0.01	ug/g						
Phenanthrene	ND	0.02	ug/g						
Pyrene	ND	0.02	ug/g						
Surrogate: 2-Fluorobiphenyl	*1.08*		*ug/g*		*80.7*	*50-140*			
Surrogate: Terphenyl-d14	*1.34*		*ug/g*		*101*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g						
Benzene	ND	0.02	ug/g						
Bromodichloromethane	ND	0.05	ug/g						
Bromoform	ND	0.05	ug/g						
Bromomethane	ND	0.05	ug/g						
Carbon Tetrachloride	ND	0.05	ug/g						
Chlorobenzene	ND	0.05	ug/g						
Chloroform	ND	0.05	ug/g						
Dibromochloromethane	ND	0.05	ug/g						

Certificate of Analysis
Client: DST Consulting Engineers Inc. (Ottawa)
Client PO:

Report Date: 26-Mar-2019
Order Date: 20-Mar-2019
Project Description: TS SO 37029

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Dichlorodifluoromethane	ND	0.05	ug/g						
1,2-Dichlorobenzene	ND	0.05	ug/g						
1,3-Dichlorobenzene	ND	0.05	ug/g						
1,4-Dichlorobenzene	ND	0.05	ug/g						
1,1-Dichloroethane	ND	0.05	ug/g						
1,2-Dichloroethane	ND	0.05	ug/g						
1,1-Dichloroethylene	ND	0.05	ug/g						
cis-1,2-Dichloroethylene	ND	0.05	ug/g						
trans-1,2-Dichloroethylene	ND	0.05	ug/g						
1,2-Dichloropropane	ND	0.05	ug/g						
cis-1,3-Dichloropropylene	ND	0.05	ug/g						
trans-1,3-Dichloropropylene	ND	0.05	ug/g						
1,3-Dichloropropene, total	ND	0.05	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Ethylene dibromide (dibromoethane	ND	0.05	ug/g						
Hexane	ND	0.05	ug/g						
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g						
Methyl Isobutyl Ketone	ND	0.50	ug/g						
Methyl tert-butyl ether	ND	0.05	ug/g						
Methylene Chloride	ND	0.05	ug/g						
Styrene	ND	0.05	ug/g						
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g						
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g						
Tetrachloroethylene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
1,1,1-Trichloroethane	ND	0.05	ug/g						
1,1,2-Trichloroethane	ND	0.05	ug/g						
Trichloroethylene	ND	0.05	ug/g						
Trichlorofluoromethane	ND	0.05	ug/g						
Vinyl chloride	ND	0.02	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: 4-Bromofluorobenzene	*2.85*		*ug/g*		*89.0*	*50-140*			
Surrogate: Dibromofluoromethane	*3.82*		*ug/g*		*119*	*50-140*			
Surrogate: Toluene-d8	*2.73*		*ug/g*		*85.4*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	225	7	ug/g dry	230			2.1	40	
F2 PHCs (C10-C16)	ND	4	ug/g dry	ND				30	
F3 PHCs (C16-C34)	ND	8	ug/g dry	ND				30	
F4 PHCs (C34-C50)	ND	6	ug/g dry	ND				30	
F4G PHCs (gravimetric)	3390	50	ug/g dry	2700			22.6	30	
Metals									
Antimony	1.3	1.0	ug/g dry	ND			0.0	30	
Arsenic	5.8	1.0	ug/g dry	4.8			18.7	30	
Barium	45.6	1.0	ug/g dry	38.4			17.1	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron	8.2	5.0	ug/g dry	6.8			17.8	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	13.1	5.0	ug/g dry	10.5			22.0	30	
Cobalt	3.9	1.0	ug/g dry	3.2			20.0	30	
Copper	20.6	5.0	ug/g dry	17.3			17.5	30	
Lead	28.9	1.0	ug/g dry	24.4			16.9	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	8.5	5.0	ug/g dry	7.0			20.2	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	21.2	10.0	ug/g dry	16.3			26.2	30	
Zinc	87.1	20.0	ug/g dry	67.6			25.2	30	
Physical Characteristics									
% Solids	86.9	0.1	% by Wt.	88.7			2.0	25	
Semi-Volatiles									
Acenaphthene	ND	0.02	ug/g dry	ND				40	
Acenaphthylene	ND	0.02	ug/g dry	ND				40	
Anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] anthracene	ND	0.02	ug/g dry	ND				40	
Benzo [a] pyrene	ND	0.02	ug/g dry	ND				40	
Benzo [b] fluoranthene	ND	0.02	ug/g dry	ND				40	
Benzo [g,h,i] perylene	ND	0.02	ug/g dry	ND				40	
Benzo [k] fluoranthene	ND	0.02	ug/g dry	ND				40	
Chrysene	ND	0.02	ug/g dry	ND				40	
Dibenzo [a,h] anthracene	ND	0.02	ug/g dry	ND				40	
Fluoranthene	ND	0.02	ug/g dry	ND				40	
Fluorene	ND	0.02	ug/g dry	ND				40	
Indeno [1,2,3-cd] pyrene	ND	0.02	ug/g dry	ND				40	
1-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
2-Methylnaphthalene	ND	0.02	ug/g dry	ND				40	
Naphthalene	ND	0.01	ug/g dry	ND				40	
Phenanthrene	ND	0.02	ug/g dry	ND				40	
Pyrene	ND	0.02	ug/g dry	ND				40	
Surrogate: 2-Fluorobiphenyl	*1.51*		*ug/g dry*		*88.2*	*50-140*			
Surrogate: Terphenyl-d14	*2.15*		*ug/g dry*		*126*	*50-140*			
Volatiles									
Acetone	ND	0.50	ug/g dry	ND				50	
Benzene	ND	0.02	ug/g dry	ND				50	
Bromodichloromethane	ND	0.05	ug/g dry	ND				50	
Bromoform	ND	0.05	ug/g dry	ND				50	
Bromomethane	ND	0.05	ug/g dry	ND				50	
Carbon Tetrachloride	ND	0.05	ug/g dry	ND				50	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Chlorobenzene	ND	0.05	ug/g dry	ND				50	
Chloroform	ND	0.05	ug/g dry	ND				50	
Dibromochloromethane	ND	0.05	ug/g dry	ND				50	
Dichlorodifluoromethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,3-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,4-Dichlorobenzene	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,2-Dichloroethane	ND	0.05	ug/g dry	ND				50	
1,1-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
cis-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
trans-1,2-Dichloroethylene	ND	0.05	ug/g dry	ND				50	
1,2-Dichloropropane	ND	0.05	ug/g dry	ND				50	
cis-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
trans-1,3-Dichloropropylene	ND	0.05	ug/g dry	ND				50	
Ethylbenzene	0.836	0.05	ug/g dry	0.849			1.6	50	
Ethylene dibromide (dibromoethane	ND	0.05	ug/g dry	ND				50	
Hexane	ND	0.05	ug/g dry	ND				50	
Methyl Ethyl Ketone (2-Butanone)	ND	0.50	ug/g dry	ND				50	
Methyl Isobutyl Ketone	ND	0.50	ug/g dry	ND				50	
Methyl tert-butyl ether	ND	0.05	ug/g dry	ND				50	
Methylene Chloride	ND	0.05	ug/g dry	ND				50	
Styrene	ND	0.05	ug/g dry	ND				50	
1,1,1,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2,2-Tetrachloroethane	ND	0.05	ug/g dry	ND				50	
Tetrachloroethylene	ND	0.05	ug/g dry	ND				50	
Toluene	0.237	0.05	ug/g dry	0.237			0.1	50	
1,1,1-Trichloroethane	ND	0.05	ug/g dry	ND				50	
1,1,2-Trichloroethane	ND	0.05	ug/g dry	ND				50	
Trichloroethylene	ND	0.05	ug/g dry	ND			0.0	50	
Trichlorofluoromethane	ND	0.05	ug/g dry	ND				50	
Vinyl chloride	ND	0.02	ug/g dry	ND				50	
m,p-Xylenes	7.67	0.05	ug/g dry	7.85			2.3	50	
o-Xylene	2.48	0.05	ug/g dry	2.50			0.8	50	
Surrogate: 4-Bromofluorobenzene	*3.89*		*ug/g dry*		*103*	*50-140*			
Surrogate: Dibromofluoromethane	*2.99*		*ug/g dry*		*79.1*	*50-140*			
Surrogate: Toluene-d8	*3.02*		*ug/g dry*		*79.9*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	188	7	ug/g		94.1	80-120			
F2 PHCs (C10-C16)	120	4	ug/g	ND	123	60-140			
F3 PHCs (C16-C34)	305	8	ug/g	ND	127	60-140			
F4 PHCs (C34-C50)	184	6	ug/g	ND	122	60-140			
F4G PHCs (gravimetric)	940	50	ug/g		94.0	80-120			
Metals									
Antimony	45.8		ug/L	ND	91.2	70-130			
Arsenic	52.8		ug/L	1.9	102	70-130			
Barium	65.1		ug/L	15.4	99.4	70-130			
Beryllium	53.1		ug/L	ND	106	70-130			
Boron	49.1		ug/L	ND	92.8	70-130			
Cadmium	48.4		ug/L	ND	96.5	70-130			
Chromium (VI)	0.2		mg/L	ND	84.0	70-130			
Chromium	53.3		ug/L	ND	98.2	70-130			
Cobalt	49.2		ug/L	1.3	95.9	70-130			
Copper	52.6		ug/L	6.9	91.4	70-130			
Lead	53.3		ug/L	9.8	87.0	70-130			
Mercury	1.60	0.1	ug/g	ND	107	70-130			
Molybdenum	50.1		ug/L	ND	99.8	70-130			
Nickel	53.4		ug/L	ND	101	70-130			
Selenium	47.9		ug/L	ND	95.4	70-130			
Silver	45.5		ug/L	ND	90.9	70-130			
Thallium	46.4		ug/L	ND	92.7	70-130			
Uranium	48.5		ug/L	ND	96.7	70-130			
Vanadium	60.1		ug/L	ND	107	70-130			
Zinc	75.0		ug/L	27.0	96.0	70-130			
Semi-Volatiles									
Acenaphthene	0.267	0.02	ug/g	ND	125	50-140			
Acenaphthylene	0.220	0.02	ug/g	ND	103	50-140			
Anthracene	0.227	0.02	ug/g	ND	106	50-140			
Benzo [a] anthracene	0.225	0.02	ug/g	ND	105	50-140			
Benzo [a] pyrene	0.190	0.02	ug/g	ND	88.6	50-140			
Benzo [b] fluoranthene	0.259	0.02	ug/g	ND	121	50-140			
Benzo [g,h,i] perylene	0.194	0.02	ug/g	ND	90.8	50-140			
Benzo [k] fluoranthene	0.251	0.02	ug/g	ND	117	50-140			
Chrysene	0.217	0.02	ug/g	ND	102	50-140			
Dibenzo [a,h] anthracene	0.182	0.02	ug/g	ND	85.2	50-140			
Fluoranthene	0.236	0.02	ug/g	ND	110	50-140			
Fluorene	0.223	0.02	ug/g	ND	104	50-140			
Indeno [1,2,3-cd] pyrene	0.189	0.02	ug/g	ND	88.3	50-140			
1-Methylnaphthalene	0.178	0.02	ug/g	ND	83.4	50-140			
2-Methylnaphthalene	0.206	0.02	ug/g	ND	96.3	50-140			
Naphthalene	0.236	0.01	ug/g	ND	110	50-140			
Phenanthrene	0.231	0.02	ug/g	ND	108	50-140			
Pyrene	0.227	0.02	ug/g	ND	106	50-140			
Surrogate: 2-Fluorobiphenyl	*1.39*		*ug/g*		*81.0*	*50-140*			
Volatiles									
Acetone	8.49	0.50	ug/g		84.9	50-140			
Benzene	3.92	0.02	ug/g		98.0	60-130			
Bromodichloromethane	4.30	0.05	ug/g		107	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	4.25	0.05	ug/g		106	60-130			
Bromomethane	3.51	0.05	ug/g		87.8	50-140			
Carbon Tetrachloride	4.29	0.05	ug/g		107	60-130			
Chlorobenzene	3.38	0.05	ug/g		84.4	60-130			
Chloroform	3.81	0.05	ug/g		95.2	60-130			
Dibromochloromethane	4.29	0.05	ug/g		107	60-130			
Dichlorodifluoromethane	2.68	0.05	ug/g		67.0	50-140			
1,2-Dichlorobenzene	3.94	0.05	ug/g		98.4	60-130			
1,3-Dichlorobenzene	4.05	0.05	ug/g		101	60-130			
1,4-Dichlorobenzene	3.28	0.05	ug/g		82.1	60-130			
1,1-Dichloroethane	3.18	0.05	ug/g		79.5	60-130			
1,2-Dichloroethane	3.69	0.05	ug/g		92.2	60-130			
1,1-Dichloroethylene	4.24	0.05	ug/g		106	60-130			
cis-1,2-Dichloroethylene	3.79	0.05	ug/g		94.7	60-130			
trans-1,2-Dichloroethylene	3.70	0.05	ug/g		92.6	60-130			
1,2-Dichloropropane	3.95	0.05	ug/g		98.7	60-130			
cis-1,3-Dichloropropylene	3.53	0.05	ug/g		88.2	60-130			
trans-1,3-Dichloropropylene	3.63	0.05	ug/g		90.7	60-130			
Ethylbenzene	3.17	0.05	ug/g		79.2	60-130			
Ethylene dibromide (dibromoethane	4.41	0.05	ug/g		110	60-130			
Hexane	3.42	0.05	ug/g		85.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	8.27	0.50	ug/g		82.7	50-140			
Methyl Isobutyl Ketone	10.8	0.50	ug/g		108	50-140			
Methyl tert-butyl ether	8.10	0.05	ug/g		81.0	50-140			
Methylene Chloride	3.33	0.05	ug/g		83.3	60-130			
Styrene	4.16	0.05	ug/g		104	60-130			
1,1,1,2-Tetrachloroethane	3.79	0.05	ug/g		94.8	60-130			
1,1,2,2-Tetrachloroethane	2.40	0.05	ug/g		60.1	60-130			
Tetrachloroethylene	4.11	0.05	ug/g		103	60-130			
Toluene	3.12	0.05	ug/g		77.9	60-130			
1,1,1-Trichloroethane	3.99	0.05	ug/g		99.7	60-130			
1,1,2-Trichloroethane	4.29	0.05	ug/g		107	60-130			
Trichloroethylene	4.68	0.05	ug/g		117	60-130			
Trichlorofluoromethane	3.30	0.05	ug/g		82.5	50-140			
Vinyl chloride	2.99	0.02	ug/g		74.6	50-140			
m,p-Xylenes	9.32	0.05	ug/g		116	60-130			
o-Xylene	3.30	0.05	ug/g		82.5	60-130			

Qualifier Notes:

Sample Qualifiers :

1 : GC-FID signal did not return to baseline by C50

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

PARACEL LABORATORIES LTD.

Paracel ID: 1912428

Laurent Blvd.
io K1G 4J8
1947
aracellabs.com

Chain of Custody
(Lab Use Only)
Nº 47493

Page ___ of ___

Client Name: DST Group	Project Reference: TOSO-37029
Contact Name: Shahab Nowrozi / Cameron F.	Quote #:
Address: 203-2150 Thurston Drive Ottawa ON	PO #:
Telephone: 613-295-5622	Email Address: Shnowrozi@...

Turnaround Time:
☐ 1 Day ☐ 3 Day
☐ 2 Day ☒ Regular
Date Required: ___

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ___ ☐ Other: ___

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 1912428

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: BTEX	PAHs	VOCs	Metals	Mercury, Chromium 6, Lead	PHCs
1	BH19-5 SS1	S		2	2019-19	PM	X	X	X	X	X	X
2	BH19-11B SS 3.	S		2	20-03-19	AM	X	X	X	X	X	X
3												
4												
5												
6												
7												
8												
9												
10												

Comments:

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Shahab Nowrozi	Date/Time:	Date/Time: March 20, 19 3	Date/Time: 3/20/19
Date/Time: March 20, 2019 @ 1600 HR	Temperature: ___ °C	Temperature: 10.1 °C	pH Verified [ ] By:

PARACEL LABORATORIES LTD.
TRUSTED. RESPONSIVE. RELIABLE.

300 - 2319 St. Laurent Blvd
Ottawa, ON, K1G 4J8
1-800-749-1947
www.paracellabs.com

Certificate of Analysis

DST Consulting Engineers Inc. (Ottawa)

203-2150 Thurston Dr.
Ottawa, ON K1G 5T9
Attn: Cameron Fischl

Client PO:
Project: TS SO 37029
Custody: 120533

Report Date: 4-Apr-2019
Order Date: 29-Mar-2019

Order #: 1913648

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

Paracel ID	Client ID
1913648-01	BH19-9
1913648-02	BH19-9 Dup
1913648-03	BH19-6
1913648-04	BH19-4

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - water	MOE E3056 - colourimetric	1-Apr-19	1-Apr-19
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	1-Apr-19	1-Apr-19
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Apr-19	1-Apr-19
pH	EPA 150.1 - pH probe @25 °C	1-Apr-19	1-Apr-19
PHC F1	CWS Tier 1 - P&T GC-FID	30-Mar-19	1-Apr-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	1-Apr-19	2-Apr-19
REG 153: PAHs by GC-MS	EPA 625 - GC-MS, extraction	3-Apr-19	4-Apr-19
REG 153: VOCs by P&T GC/MS	EPA 624 - P&T GC-MS	30-Mar-19	1-Apr-19

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 04-Apr-2019

Order Date: 29-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-9	BH19-9 Dup	BH19-6	BH19-4
	Sample Date:	03/29/2019 10:30	03/29/2019 10:30	03/29/2019 12:30	03/29/2019 14:30
	Sample ID:	1913648-01	1913648-02	1913648-03	1913648-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
pH	0.1 pH Units	7.4	7.4	6.8	7.5
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	1	1	<1	<1
Barium	1 ug/L	975	993	187	184
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	27	27	836	35
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	<1	<1	<1
Chromium (VI)	10 ug/L	<10	<10	<10	<10
Cobalt	0.5 ug/L	1.4	1.5	3.6	1.0
Copper	0.5 ug/L	0.6	8.7	1.1	<0.5
Lead	0.1 ug/L	0.2	1.3	0.2	<0.1
Molybdenum	0.5 ug/L	2.3	2.2	1.8	1.6
Nickel	1 ug/L	5	6	13	3
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	36200	37200	198000	29100
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	3.0	3.3	0.9	0.5
Vanadium	0.5 ug/L	1.4	1.7	0.8	0.5
Zinc	5 ug/L	11	35	22	<5
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Benzene	0.5 ug/L	<0.5	<0.5	1.3	<0.5
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromoform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Bromomethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Chloroform	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Client: DST Consulting Engineers Inc. (Ottawa)

Client PO:

Report Date: 04-Apr-2019

Order Date: 29-Mar-2019

Project Description: TS SO 37029

	Client ID:	BH19-9	BH19-9 Dup	BH19-6	BH19-4
	Sample Date:	03/29/2019 10:30	03/29/2019 10:30	03/29/2019 12:30	03/29/2019 14:30
	Sample ID:	1913648-01	1913648-02	1913648-03	1913648-04
	MDL/Units	Water	Water	Water	Water
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	0.5	<0.5
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	4.1	<0.5
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylene dibromide (dibromoethar	0.2 ug/L	<0.2	<0.2	<0.2	<0.2
Hexane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	<2.0	<2.0
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Styrene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	0.5 ug/L	3.3	3.6	1.1	1.5
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	<1.0	<1.0
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Xylenes, total	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
4-Bromofluorobenzene	Surrogate	117%	117%	117%	120%
Dibromofluoromethane	Surrogate	90.6%	92.7%	75.1%	74.5%
Toluene-d8	Surrogate	99.8%	99.2%	99.7%	99.9%
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	<25	<25

Certificate of Analysis

Report Date: 04-Apr-2019

Client: DST Consulting Engineers Inc. (Ottawa)

Order Date: 29-Mar-2019

Client PO:

Project Description: TS SO 37029

	Client ID:	BH19-9	BH19-9 Dup	BH19-6	BH19-4
	Sample Date:	03/29/2019 10:30	03/29/2019 10:30	03/29/2019 12:30	03/29/2019 14:30
	Sample ID:	1913648-01	1913648-02	1913648-03	1913648-04
	MDL/Units	Water	Water	Water	Water
F2 PHCs (C10-C16)	100 ug/L	<100	<100	<100	<100
F3 PHCs (C16-C34)	100 ug/L	<100	<100	<100	<100
F4 PHCs (C34-C50)	100 ug/L	<100	<100	<100	<100
Semi-Volatiles					
Acenaphthene	0.05 ug/L	<0.05	<0.05	0.38	<0.05
Acenaphthylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Anthracene	0.01 ug/L	<0.01	<0.01	0.05	<0.01
Benzo [a] anthracene	0.01 ug/L	<0.01	<0.01	0.04	<0.01
Benzo [a] pyrene	0.01 ug/L	<0.01	<0.01	0.03	<0.01
Benzo [b] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [g,h,i] perylene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Benzo [k] fluoranthene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Chrysene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Dibenzo [a,h] anthracene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Fluoranthene	0.01 ug/L	<0.01	<0.01	0.08	<0.01
Fluorene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Indeno [1,2,3-cd] pyrene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
1-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
2-Methylnaphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Methylnaphthalene (1&2)	0.10 ug/L	<0.10	<0.10	<0.10	<0.10
Naphthalene	0.05 ug/L	<0.05	<0.05	<0.05	<0.05
Phenanthrene	0.05 ug/L	<0.05	<0.05	0.08	<0.05
Pyrene	0.01 ug/L	<0.01	<0.01	0.07	<0.01
2-Fluorobiphenyl	Surrogate	87.5%	98.5%	83.1%	87.5%
Terphenyl-d14	Surrogate	101%	116%	98.7%	115%

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium (VI)	ND	10	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						
Semi-Volatiles									
Acenaphthene	ND	0.05	ug/L						
Acenaphthylene	ND	0.05	ug/L						
Anthracene	ND	0.01	ug/L						
Benzo [a] anthracene	ND	0.01	ug/L						
Benzo [a] pyrene	ND	0.01	ug/L						
Benzo [b] fluoranthene	ND	0.05	ug/L						
Benzo [g,h,i] perylene	ND	0.05	ug/L						
Benzo [k] fluoranthene	ND	0.05	ug/L						
Chrysene	ND	0.05	ug/L						
Dibenzo [a,h] anthracene	ND	0.05	ug/L						
Fluoranthene	ND	0.01	ug/L						
Fluorene	ND	0.05	ug/L						
Indeno [1,2,3-cd] pyrene	ND	0.05	ug/L						
1-Methylnaphthalene	ND	0.05	ug/L						
2-Methylnaphthalene	ND	0.05	ug/L						
Methylnaphthalene (1&2)	ND	0.10	ug/L						
Naphthalene	ND	0.05	ug/L						
Phenanthrene	ND	0.05	ug/L						
Pyrene	ND	0.01	ug/L						
Surrogate: 2-Fluorobiphenyl	*16.9*		*ug/L*		*84.3*	*50-140*			
Surrogate: Terphenyl-d14	*20.6*		*ug/L*		*103*	*50-140*			
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroform	ND	0.5	ug/L						
Dibromochloromethane	ND	0.5	ug/L						

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Ethylene dibromide (dibromoethane,	ND	0.2	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*83.4*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*86.4*		*ug/L*		*108*	*50-140*			
Surrogate: Toluene-d8	*90.3*		*ug/L*		*113*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.6	0.1	pH Units	7.6			0.8	10	
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Metals									
Mercury	ND	0.1	ug/L	ND			0.0	20	
Antimony	0.97	0.5	ug/L	0.71			31.7	20	QR-01
Arsenic	1.1	1	ug/L	1.1			3.6	20	
Barium	137	1	ug/L	138			0.7	20	
Beryllium	ND	0.5	ug/L	ND			0.0	20	
Boron	184	10	ug/L	183			0.3	20	
Cadmium	ND	0.1	ug/L	ND			0.0	20	
Chromium (VI)	ND	10	ug/L	ND				20	
Chromium	ND	1	ug/L	ND			0.0	20	
Cobalt	2.14	0.5	ug/L	2.15			0.4	20	
Copper	7.09	0.5	ug/L	7.11			0.2	20	
Lead	0.54	0.1	ug/L	0.54			0.1	20	
Molybdenum	125	0.5	ug/L	125			0.4	20	
Nickel	3.2	1	ug/L	3.2			2.5	20	
Selenium	ND	1	ug/L	ND			0.0	20	
Silver	ND	0.1	ug/L	ND			0.0	20	
Sodium	104000	200	ug/L	106000			2.6	20	
Thallium	ND	0.1	ug/L	ND			0.0	20	
Uranium	10.4	0.1	ug/L	10.4			0.6	20	
Vanadium	0.73	0.5	ug/L	0.70			4.5	20	
Zinc	7	5	ug/L	7			10.2	20	
Volatiles									
Acetone	ND	5.0	ug/L	ND				30	
Benzene	ND	0.5	ug/L	ND				30	
Bromodichloromethane	ND	0.5	ug/L	ND				30	
Bromoform	ND	0.5	ug/L	ND				30	
Bromomethane	ND	0.5	ug/L	ND				30	
Carbon Tetrachloride	ND	0.2	ug/L	ND				30	
Chlorobenzene	ND	0.5	ug/L	ND				30	
Chloroform	ND	0.5	ug/L	ND				30	
Dibromochloromethane	ND	0.5	ug/L	ND				30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND				30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND				30	
1,1-Dichloroethane	ND	0.5	ug/L	ND				30	
1,2-Dichloroethane	ND	0.5	ug/L	ND				30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND				30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND				30	
1,2-Dichloropropane	ND	0.5	ug/L	ND				30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Ethylene dibromide (dibromoethane,	ND	0.2	ug/L	ND				30	
Hexane	ND	1.0	ug/L	ND				30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND				30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND				30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND				30	
Methylene Chloride	ND	5.0	ug/L	ND				30	
Styrene	ND	0.5	ug/L	ND				30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND				30	

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Tetrachloroethylene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND				30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND				30	
Trichloroethylene	ND	0.5	ug/L	ND				30	
Trichlorofluoromethane	ND	1.0	ug/L	ND				30	
Vinyl chloride	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: 4-Bromofluorobenzene	*82.8*		*ug/L*		*104*	*50-140*			
Surrogate: Dibromofluoromethane	*84.7*		*ug/L*		*106*	*50-140*			
Surrogate: Toluene-d8	*92.9*		*ug/L*		*116*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1950	25	ug/L		97.5	68-117			
F2 PHCs (C10-C16)	1590	100	ug/L		99.3	60-140			
F3 PHCs (C16-C34)	4150	100	ug/L		106	60-140			
F4 PHCs (C34-C50)	2140	100	ug/L		86.4	60-140			
Metals									
Mercury	2.89	0.1	ug/L	ND	96.5	70-130			
Antimony	47.2		ug/L	0.71	93.1	80-120			
Arsenic	56.3		ug/L	1.1	110	80-120			
Barium	178		ug/L	138	79.5	80-120			QM-07
Beryllium	52.8		ug/L	ND	105	80-120			
Boron	228		ug/L	183	90.1	80-120			
Cadmium	47.2		ug/L	ND	94.4	80-120			
Chromium (VI)	207	10	ug/L	ND	104	70-130			
Chromium	58.9		ug/L	ND	117	80-120			
Cobalt	51.1		ug/L	2.15	97.8	80-120			
Copper	58.9		ug/L	7.11	104	80-120			
Lead	45.7		ug/L	0.54	90.3	80-120			
Molybdenum	177		ug/L	125	104	80-120			
Nickel	55.3		ug/L	3.2	104	80-120			
Selenium	49.0		ug/L	ND	96.6	80-120			
Silver	44.3		ug/L	ND	88.7	80-120			
Sodium	63500		ug/L	51800	116	80-120			
Thallium	46.3		ug/L	ND	92.5	80-120			
Uranium	60.4		ug/L	10.4	100	80-120			
Vanadium	60.4		ug/L	0.70	119	80-120			
Zinc	54		ug/L	7	93.1	80-120			
Semi-Volatiles									
Acenaphthene	3.70	0.05	ug/L		74.0	50-140			
Acenaphthylene	3.55	0.05	ug/L		71.0	50-140			
Anthracene	4.05	0.01	ug/L		81.0	50-140			
Benzo [a] anthracene	4.54	0.01	ug/L		90.8	50-140			
Benzo [a] pyrene	4.53	0.01	ug/L		90.7	50-140			
Benzo [b] fluoranthene	5.47	0.05	ug/L		109	50-140			
Benzo [g,h,i] perylene	3.97	0.05	ug/L		79.3	50-140			
Benzo [k] fluoranthene	5.56	0.05	ug/L		111	50-140			
Chrysene	5.47	0.05	ug/L		109	50-140			
Dibenzo [a,h] anthracene	4.04	0.05	ug/L		80.8	50-140			
Fluoranthene	4.13	0.01	ug/L		82.7	50-140			
Fluorene	4.08	0.05	ug/L		81.6	50-140			
Indeno [1,2,3-cd] pyrene	4.31	0.05	ug/L		86.3	50-140			
1-Methylnaphthalene	5.10	0.05	ug/L		102	50-140			
2-Methylnaphthalene	5.57	0.05	ug/L		111	50-140			
Naphthalene	4.78	0.05	ug/L		95.6	50-140			
Phenanthrene	4.24	0.05	ug/L		84.9	50-140			
Pyrene	4.25	0.01	ug/L		84.9	50-140			
Surrogate: 2-Fluorobiphenyl	*20.6*		*ug/L*		*103*	*50-140*			
Volatiles									
Acetone	74.1	5.0	ug/L		74.1	50-140			
Benzene	35.6	0.5	ug/L		89.0	60-130			
Bromodichloromethane	35.4	0.5	ug/L		88.5	60-130			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Bromoform	33.5	0.5	ug/L		83.7	60-130			
Bromomethane	31.4	0.5	ug/L		78.5	50-140			
Carbon Tetrachloride	37.1	0.2	ug/L		92.8	60-130			
Chlorobenzene	35.6	0.5	ug/L		89.0	60-130			
Chloroform	37.3	0.5	ug/L		93.2	60-130			
Dibromochloromethane	35.2	0.5	ug/L		88.0	60-130			
Dichlorodifluoromethane	35.3	1.0	ug/L		88.2	50-140			
1,2-Dichlorobenzene	33.5	0.5	ug/L		83.8	60-130			
1,3-Dichlorobenzene	34.9	0.5	ug/L		87.2	60-130			
1,4-Dichlorobenzene	34.9	0.5	ug/L		87.2	60-130			
1,1-Dichloroethane	38.2	0.5	ug/L		95.4	60-130			
1,2-Dichloroethane	39.6	0.5	ug/L		99.0	60-130			
1,1-Dichloroethylene	31.6	0.5	ug/L		79.1	60-130			
cis-1,2-Dichloroethylene	35.8	0.5	ug/L		89.5	60-130			
trans-1,2-Dichloroethylene	36.5	0.5	ug/L		91.2	60-130			
1,2-Dichloropropane	32.3	0.5	ug/L		80.8	60-130			
cis-1,3-Dichloropropylene	33.6	0.5	ug/L		83.9	60-130			
trans-1,3-Dichloropropylene	33.7	0.5	ug/L		84.3	60-130			
Ethylbenzene	34.8	0.5	ug/L		87.0	60-130			
Ethylene dibromide (dibromoethane,	38.8	0.2	ug/L		97.1	60-130			
Hexane	31.4	1.0	ug/L		78.5	60-130			
Methyl Ethyl Ketone (2-Butanone)	79.5	5.0	ug/L		79.5	50-140			
Methyl Isobutyl Ketone	77.0	5.0	ug/L		77.0	50-140			
Methyl tert-butyl ether	83.4	2.0	ug/L		83.4	50-140			
Methylene Chloride	35.2	5.0	ug/L		88.1	60-130			
Styrene	31.0	0.5	ug/L		77.4	60-130			
1,1,1,2-Tetrachloroethane	37.5	0.5	ug/L		93.6	60-130			
1,1,2,2-Tetrachloroethane	41.6	0.5	ug/L		104	60-130			
Tetrachloroethylene	43.0	0.5	ug/L		108	60-130			
Toluene	37.9	0.5	ug/L		94.6	60-130			
1,1,1-Trichloroethane	37.8	0.5	ug/L		94.6	60-130			
1,1,2-Trichloroethane	36.1	0.5	ug/L		90.2	60-130			
Trichloroethylene	34.4	0.5	ug/L		85.9	60-130			
Trichlorofluoromethane	35.1	1.0	ug/L		87.7	60-130			
Vinyl chloride	29.3	0.5	ug/L		73.3	50-140			
m,p-Xylenes	69.6	0.5	ug/L		87.0	60-130			
o-Xylene	35.4	0.5	ug/L		88.6	60-130			

Qualifier Notes:

QC Qualifiers :

QM-07 : The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on other acceptable QC.

QR-01 : Duplicate RPD is high, however, the sample result is less than 10x the MDL.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.

CCME PHC additional information:

- The method for the analysis of PHCs complies with the Reference Method for the CWS PHC and is validated for use in the laboratory. All prescribed quality criteria identified in the method has been met.
- F1 range corrected for BTEX.
- F2 to F3 ranges corrected for appropriate PAHs where available.
- The gravimetric heavy hydrocarbons (F4G) are not to be added to C6 to C50 hydrocarbons.
- In the case where F4 and F4G are both reported, the greater of the two results is to be used for comparison to CWS PHC criteria.

PARACEL LABORATORIES LTD.

Paracel ID: 1913648

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

Chain of Custody
(Lab Use Only)
№ 120533

Page 1 of 1

Client Name: DST Group	Project Reference: TSD-37029	**Turnaround Time:**
Contact Name: Cameron Fischl	Quote #	☐ 1 Day ☐ 3 Day
Address: 250 Thurston Drive Ottawa, On. K1G 5T9	PO #	☐ 2 Day ☒ Regular
Telephone: 613-402-03983	Email Address: cfischl@dstgroup.com	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ____ ☐ Other: ____

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: 1913648 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	HWD	→ Added as per Cameron SC
1	BH19-9	GW		8	1030	2019/03/28	X	X	X	X	X	X	X	X	
2	BH19-9 Dup	GW		8	1030	↓	X	X	X	X	X	X	X	X	
3	BH19-6	GW		8	1230	↓	X	X	X	X	X	X	X	X	
4	BH19-4	GW		8	1450	↓	X	X	X	X	X	X	X	X	
5															
6															
7															
8															
9															
10															

Method of Delivery: Walk-in

Comments:

Relinquished By (Sign): Cameron Fischl / Cameron Fischl	Received by Driver/Depot:	Received at Lab: Ben Stewart	Verified By:
Relinquished By (Print): Cameron Fischl	Date/Time:	Date/Time: 29 March 19 15:24	Date/Time: 3/29/19 15:42
Date/Time: 2019/03/29 1530	Temperature: °C	Temperature: 13.1 °C	pH Verified ☒ By: NX