Phase Two Environmental Site Assessment

Lincoln Fields Shopping Centre, 2525 Carling Avenue, Ottawa, Ontario

Submitted to:

Marc Calvé
RioCan Management Inc.
RioCan Young Eglinton Centre
2300 Young Street, Suite 500
Toronto, ON
M4P 1E4

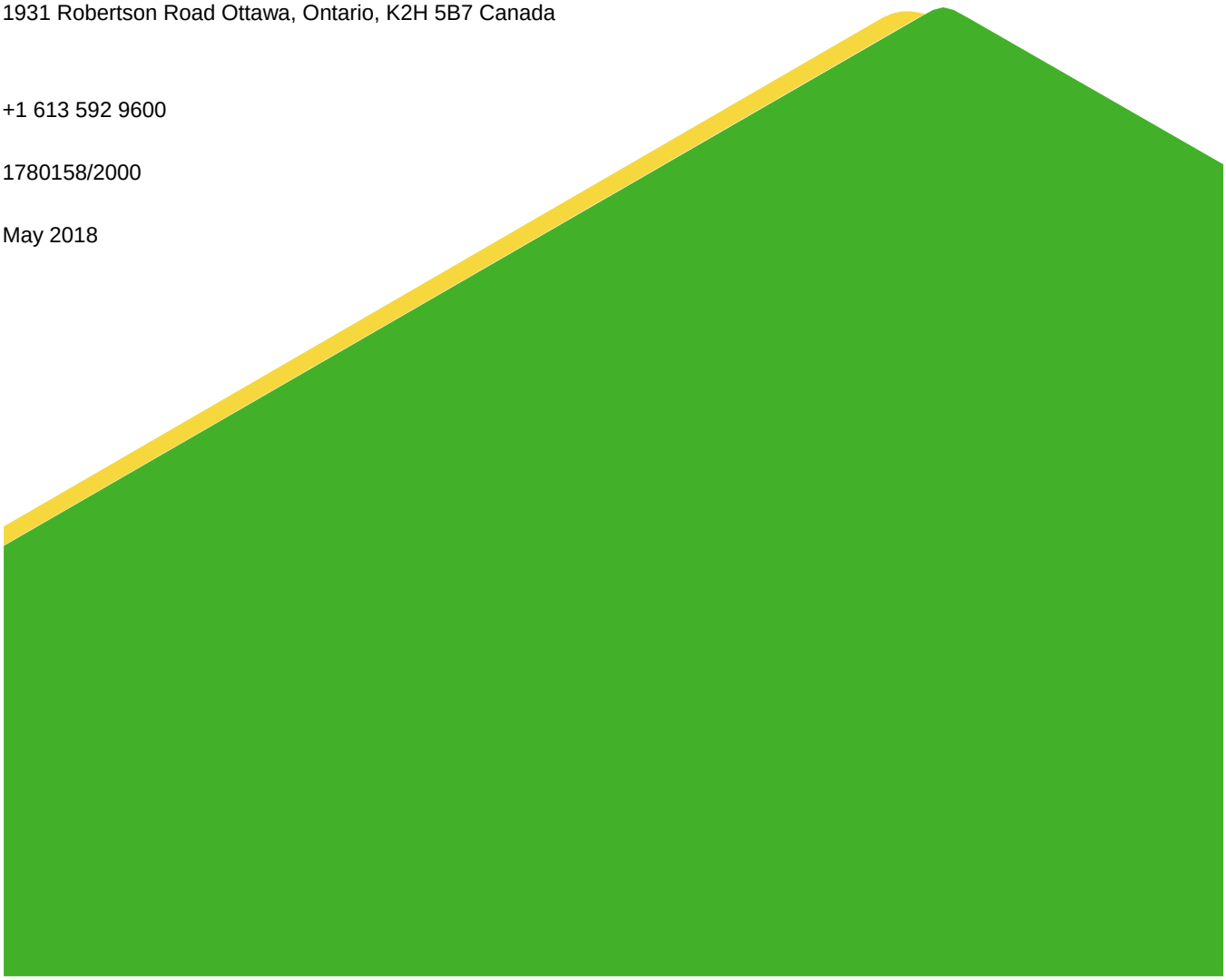
Submitted by:

Golder Associates Ltd.
1931 Robertson Road Ottawa, Ontario, K2H 5B7 Canada

+1 613 592 9600

1780158/2000

May 2018



Distribution List

1 e-copy - RioCan Management Inc.

5 copies - RioCan Management Inc.

1 e-copy - Golder

Executive Summary

The Executive Summary highlights key points from the report only; for complete information and findings, as well as the limitations, the reader should examine the complete report.

Golder Associates Ltd. (Golder) was retained by RioCan Management Inc. (RioCan) to carry out a Phase Two Environmental Site Assessment (ESA) of the property located at Lincoln Fields Shopping Centre, 2525 Carling Avenue, Ottawa, Ontario (herein after referred to as the "Site" or "Phase Two Property") as shown on Figure 1. The Site has a total area of approximately 6.6 hectares (16.2 acres). The Site comprises City of Ottawa property identification numbers (PIN) 039630004, 03960007, and 039630038. Golder understands that RioCan is redeveloping the Site as two areas: Area A, the commercial portion of the Site, and Area B, mixed use residential/commercial towers.

Given that the Site land use will change from less sensitive (commercial) to more sensitive (residential) land use there is a mandatory requirement for filing of a Record of Site Condition (RSC) pursuant to *Ontario Regulation 153/04 – Records of Site Condition – Part XV.1 of the Act*, made under the *Environmental Protection Act.* As such, this Phase Two ESA was completed in accordance with the requirements of Schedule E of O.Reg. 153/04 (as amended) to support the filing of an RSC for the Site. The boundaries of the property for which the RSC will be filed (the "RSC Property) and the Phase Two Property are the same. As such, for reference throughout the report, the RSC Property will be referred as the Site.

The Phase Two ESA was carried out at the Site in accordance with O.Reg. 153/04 to address the following eight (8) APECs identified in the 2018 Golder Phase One ESA recently completed for the Site:

- APEC 1 - Potential for soil and groundwater impacts due to the presence of a transformer vault on the Site. #18. Electricity Generation, Transformation and Power Stations – The transformer vault for Lincoln Fields Shopping Centre in the northeast corner of the building.
- APEC 2 - Potential for soil and groundwater impacts due to the presence of a pad-mounted transformer on the Site.#18. Electricity Generation, Transformation and Power Stations – One pad-mounted transformer was located in the parking lot on the southwest portion of the Site north of Wendy's.
- APEC 3 - Potential for soil and groundwater impacts due to the presence of a hydraulic oil AST associated with the hydraulic elevator.#28. Gasoline and Associated Products in Fixed Tanks – The shopping centre is serviced by one hydraulic lift elevator, with associated hydraulic oil tank, located in the middle of the mall.
- APEC 4 - Potential for soil and groundwater impacts due to suspected former dry cleaning activities within the Phase One Property.#37. Operation of Dry Cleaning Equipment (where chemicals are used) – Review of HLUI and Street directories indicated the presence a dry cleaner on-Site. The cleaners currently on-Site are only a drop-off depot.
- APEC 5 - Potential for soil and groundwater impacts due to the presence of a bulk storage AST, former oil water separator, and former auto servicing activities.#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops – The former Walmart had vehicle servicing bay in the northeast corner of the store operated as a garage for decades. A bulk storage AST in the service bay was identified, as well as an underground oil water separator.

- APEC 6 - Potential for soil and groundwater impacts due to the presence of a waste oil AST with visible staining.#28. Gasoline and Associated Products in Fixed Tanks – A waste oil AST was identified in an enclosure outside the former Walmart auto service bays.
- APEC 7 - Potential for soil and groundwater impacts due to the presence of fill of unknown quality beneath the Site.#30. Importation of Fill Material of Unknown Quality – The Site was graded with fill of unknown origin during the construction of the shopping centre in 1972.
- APEC 8 - Potential for soil and groundwater impacts due to the former presence a retail fuel outlet and garage/#28. Gasoline and Associated Products in Fixed Tanks – Records indicate that off-Site adjacent to the northwest of the Site, was a former gasoline service station with USTs.

All eight APECs were investigated during the Phase Two ESA. Based on the completed scope of work and results of the Phase Two ESA, the following conclusions are provided:

- Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (Residential/Parkland/Institutional Property Use, coarse textured soil, April 15, 2011) are considered applicable and were used to assess the environmental quality of soil and groundwater at the Site.
- Soil sampling completed at the Site indicates that none of the soil samples submitted for laboratory analysis of the COCs related to the eight APECs: PHC F1 to F4, VOCs, PAHs, metals, and/or PCBs exceeded the MOECC Table 3 Standards indicating that none of the eight APECs impacted the soil on the Site.
- Groundwater sampling completed at the Site indicates that none of the groundwater samples submitted for laboratory analyses of PHC F1 to F4, VOCs, and/or PCBs exceeded the MOE Table 3 Standards for the parameters analyzed. No odour, sheen or free product was observed or detected in any of the ten wells during the investigation. Therefore, groundwater at the Site meets the site applicable standards at the time of the investigation.
- Based on the results of the soil and groundwater duplicate samples, trip spike, trip and field blanks and the implemented quality assurance and quality control measures during the Phase Two ESA, it is considered that the data obtained during the Phase Two ESA is reliable, reproducible and representative of the Site conditions.
- Based on the results obtained during the Phase Two ESA, soil or groundwater impacts associated with the eight APECs on the Site were not identified and the soil and groundwater quality at the Site meets the applicable standards at the time of the investigation.
- The monitoring wells installed on the Site as part of the Phase Two ESA should be decommissioned in accordance with Ontario Regulation 903 if no longer required.

Table of Contents

TABLES EMBEDDED WITHIN REPORT

TABLES FOLLOWING REPORT TEXT

FIGURES

APPENDICES

APPENDIX A
Plan of Survey

APPENDIX B
Sampling and Analysis Plan

APPENDIX C
Borehole Logs

APPENDIX D
Laboratory Certificates of Analysis

1.0 INTRODUCTION

1.1 Site Description

Golder Associates Ltd. (Golder) was retained by RioCan Management Inc. (RioCan) to carry out a Phase Two Environmental Site Assessment (ESA) of the property located at Lincoln Fields Shopping Centre, 2525 Carling Avenue, Ottawa, Ontario (herein after referred to as the "Site" or "Phase Two Property") as shown on Figure 1. The Site has a total area of approximately 6.6 hectares (16.2 acres). The Site comprises City of Ottawa property identification numbers (PIN) 039630004, 03960007, and 039630038. Golder understands that RioCan is redeveloping the Site.

Given that the Site land use will change from less sensitive (commercial) to more sensitive (residential) land use there is a mandatory requirement for filing of a Record of Site Condition (RSC) pursuant to *Ontario Regulation 153/04 – Records of Site Condition – Part XV.1 of the Act*, made under the *Environmental Protection Act.* As such, this Phase Two ESA was completed in accordance with the requirements of Schedule E of O.Reg. 153/04 (as amended) to support the filing of an RSC for the Site. The boundaries of the property for which the RSC will be filed (the "RSC Property) and the Phase Two Property are the same. As such, for easy reference throughout the report, the RSC Property will be referred as the Site.

Based on the information provided by a City of Ottawa Property Report, the legal description of the Site is:

Table 1-1: Legal Description of Site

PIN	LEGAL DESCRIPTION
Township	**Ottawa**
039630004	CON 1 OF PT LOT 22 & 23 PLAN;348 PT LOT 45 TO 57 PLAN 311;PT LOT 48 RP 4R-489 PT PT 2;PTS 5 & 11
039630007	CON 1 OF PT LOT 22 & 23 PLAN;348 PT LOT 45 TO 57 PLAN 311;PT LOT 48 RP 4R-489 PT PT 2;PTS 5 & 11
039630038	CON 1 OF PT LOT 22 & 23 PLAN;348 PT LOT 45 TO 57 PLAN 311;PT LOT 48 RP 4R-489 PT PT 2;PTS 5 & 11

The Site Plan and location are provided on Figure 1. A plan of survey for the Site is provided in Appendix A. As mentioned above, the boundaries of the Phase Two Property and the RSC Property are the same and are shown on Figures 1 to 3 and on the survey plan included in Appendix A.

1.2 Property Ownership

Contact information for the Site including the current owner is provided in Table 1-2 below.

Table 1-2: Site Ownership Information

Address	Current Site Owner(s)	Contact Information
2525 Carling Avenue. Ottawa, Ontario, Canada K2B 7Z2	RioCan Management Inc.	Marc Calvé RioCan Management Inc. RioCan Young Eglinton Centre 2300 young Street, Suite 500 Toronto, Ontario M4P 1E4

1.3 Current and Proposed Future Uses

The Phase Two Property is currently developed with three (3) commercial buildings including the Lincoln Fields Shopping Centre, a Wendy's Restaurant, a Pizza Pizza, and associated parking lots. The Lincoln Fields Shopping Centre that is located on the Site is mainly occupied by Metro on the ground floor, and a variety of commercial businesses on the first floor.

The majority of the Site was vacant land used for agriculture prior to the construction of the Lincoln Fields Shopping Centre in 1971. The 1952 aerial photograph shows that Site was used primarily for agriculture, with a few residential homes along the west side of the Site along Croydon Avenue. Therefore, it can be determined that the majority of the Site was first developed with the Lincoln Fields Shopping Centre in 1971. An exception is the western edge of the Site which was first developed with residential homes prior to 1952, and was later redeveloped with the Lincoln Fields Shopping Centre in 1971.

The proposed future use of the Phase Two Property is mixed commercial and residential.

1.4 Applicable Site Condition Standard

The analytical results of the samples collected for this Phase Two ESA were compared to the Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (Residential/Parkland/Institutional (R/P/I) Property Use, coarse textured soil) ("MOECC Table 3 R/I/P") and (Industrial/Commercial/Community (I/C/C) Property Use, coarse textured soil) ("MOECC Table 3 I/C/C") for soil; and Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (All Types of Property Use) ("MOECC Table 3") presented in the Ministry of Environment and Climate Change (MOECC) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011. The applicable site condition standards were selected based on the following rationale:

- The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system and there are no water supply wells which are in use;
- The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water;
- Grain size analysis was performed, and the Site was found to have a coarse soil texture.
- There are no water bodies on the Site. The closest water body is the Ottawa River located approximately 850 m north of the Site;
- There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41 of O.Reg.153/04 as amended. Based on the data obtained from the upper fill material, soil pH ranged from 7.73 to 8.27, which is within MOECC's acceptable pH range of 5 to 9.
- The intended land use for the Phase Two Property is mixed residential and commercial, as such the more sensitive land use (residential) is considered to be applicable for the Site; and,
- The overburden thickness is greater than 2 metres over more than one-third of the Phase Two Property.

1.5 Phase Two ESA Objectives

The Phase Two ESA work was completed in three stages. The first stage of the Phase Two ESA work was completed in the north east part of the Site in the former Walmart in July 2017, the second stage was completed in southwest portion of the Site in November-December 2017, and the third stage for the remaining part of the Site from January - March 2018.

The objective of the Phase Two ESA work was:

- To assess the presence/absence of subsurface impacts at the Site associated with the APECs identified during the Phase One ESA completed for the Site and to determine the location and concentration of contaminants in the land or water on, in or under the Phase Two Property;
- To determine if the soil and groundwater quality at the Site meet the applicable MOECC site condition standards at the time of the Phase Two ESA; and,
- Prepare a Phase Two ESA report including a Phase Two ESA Conceptual Site Model (CSM) for the Site in accordance with Reg.153/04 as amended to support the filing of an RSC for the Site.

2.0 BACKGROUND INFORMATION

This section presents the background conditions of the Phase Two Property including a description of the physical setting and a summary of past investigations conducted.

The objectives of the Phase Two ESA were to obtain information about environmental conditions in the soil and groundwater on, in or under the Site, and to develop the information necessary to complete a Record of Site Condition (RSC) for the property. The objectives of this Phase Two ESA were achieved by:

- Developing an understanding of the geological and hydrogeological conditions at the Site; and,
- Conducting field sampling for all contaminants of concern (COC) associated with all areas of potential environmental concern identified at the Site.

2.1 Physical Setting

The north half of the Site is generally flat with a 1 m rise along the west side. The south half is an asymmetrical flat topped mound that is approximately 3 meters higher where the parking lot meets the shopping centre than at the sides. The surrounding areas are generally flat.

The nearest surface water body is the Ottawa River is located approximately 850 m north of the Site. There are no identified areas of natural significance within the Phase Two Study area.

Based on the Ontario base maps and previous reports completed for the Site, the western portion of the Site is situated on sand deposits whereas the eastern portion of the Site is underlain by clay and silt deposits. Based on borehole logs from the 2002 Phase Two ESA, on average the overlying fill materials consist of sand a gravel fill to 1.4 m then is underlain by native material to an average bedrock depth of 6 mbgs. Bedrock at the Site consists of Beekman Group dolostone and sandstone. The static water level is between 2 and 4 mbgs. Local and regional groundwater flow is anticipated to flow to the north.

Land uses surrounding the Phase Two Property include residential and commercial land uses and is summarized below:

North: Richmond Road runs to the north of the Site. Across Richmond is mixed commercial buildings which includes two used car dealerships and several strip malls, one of which contains a dry cleaners to the northeast.

East: Three high rise apartment buildings, a parking garage, and the transitway.

South: Carling Avenue runs along the south of the Site. A residential neighbourhood is located across Carling Avenue from the Site.

West: Croydon Avenue runs to the west of the Site. A high-rise apartment building and several commercial stores, including an auto repair shop, are east of Croydon Avenue.

2.2 Past Investigations

2.2.1 Environmental and Historical Reports

The following environmental and historical reports related to the Site were completed by Golder for RioCan in 2002 and were reviewed as part of this Phase One ESA. Reports are ordered below from oldest to most recent. Noteworthy findings are summarized in Table 2-1 and a more detailed interpretation of each document follows the table. Golder consulted these reports to develop an understanding of any issues previously identified for the Site and surrounding properties.

1) "1987 First Floor Site Plan" Insurers' Advisory Organization. October 1972. *File No. SR 8364 Lincoln Fields Shopping Centre Ottawa, Ontario.* Prepared for unknown.

2) "1988 Inspection Report" Multipak Inspection Services. July 6, 1988. *Basic Underwriting Survey.* Prepared for Peaches & Cream.

3) "2002 Phase I ESA" Golder Associates Ltd. March 15, 2002. *Phase I Environmental Site Assessment Lincoln Fields Shopping Centre 2525 Carling Avenue Ottawa, Ontario.* Prepared for Riocan Real Estate Investment Trust.

4) "2002 Phase Two ESA" Golder Associates Ltd. April 8, 2002. *Phase II Environmental Site Assessment Lincoln Fields Shopping Centre 2525 Carling Avenue Ottawa, Ontario.* Prepared for Riocan Real Estate Investment Trust.

Table 2-1: Summary of Historical and Environmental Information Review Findings

Report	On/Off Site	Factual Information
1987 First Floor Site Plan	On-Site	- Occupants: grocer, department store, restaurants, various retail stores, and auto service centre. - Building built in 1972, floor poured concrete on metal, gas powered forced air heating
1988 Inspection Report	On-Site	- In 1972 the Lincoln Fields was occupied by: IGA Groceries, Woolco, Ogilvy's, an automobile servicing centre, and the shopping mall. - Public utility underground service connections can be seen coming into the southeast corner, southwest corner, and west side of the building.

Report	On/Off Site	Factual Information
2002 Phase I ESA	On Site	Two issues of environmental concern were identified: - On-Site: Automobile service garage which historically included six service bays and, at the time of the assessment, only had four. The area had an oil water separator which required assessment. There was records of a waste oil UST which was removed in 1995 along with a remediation of 197 tons of contaminated soil. It was unclear whether the remediation was completed to modern standards. Finally, two ASTs, a waste oil and a bulk product AST, as well as hydraulic lifts were noted on the Site; and, - Off-Site: The former presence of a retail fuel outlet adjacent to the northwest side of the property. A 1998 Phase Two ESA reported no impacts. A variety of designated substances within the building were also identified including: - PCBs in the form of light ballasts stored in barrels in a “PCB room”; - Friable and non-friable ACM materials throughout building - Possible lead-based paints, pipes, and solder; - ODS in roof top heating, ventilation, and air conditioning systems, as well as in cooling systems such as fridges, freezers, and vending machines; and, - Possible presence of mercury in electrical equipment.
2002 Phase Two ESA	On Site	- Ten boreholes were tested including two on the northwest side of the property to assess the former service station, and eight in and around the service bays in the Walmart. - Groundwater in service bay area was inferred to flow easterly. Flow could not be inferred near service station due to lack of data. - Along the northwest side adjacent the former service station, TPH-heavy oils were detected in soil and TPH-diesel in groundwater below Table B and Table A respectively at both boreholes. No other detections were noted. - In the service bay area soil samples has trace levels of TPh-heavy oils and TPH-diesel below Table B, and groundwater samples had trace levels of TPH-diesel below Table A.

Both the 1987 Site Plan and 1988 Inspection Report mentioned auto servicing areas, which would be considered a PCA under the regulation.

From the issues of environmental concern noted in the 2002 Phase I ESA, five PCAs were identified for the Phase One Property. There appears to have been three instances of PCA #28: Gasoline and Associated Products Storage in Fixed Tanks including the waste oil UST removed from the Walmart automotive service bay area in 1995, and two ASTs in the same area which contained waste oil and bulk products. Given that that these PCAs are on Site, they would be considered to be contributing to APECs on-Site under the current regulation. The USTs of the former retail fuel outlet adjacent to the northwest side of the site, due to its close proximity, would also be considered a PCA contributing to an APEC.

The 2002 Phase Two ESA includes figures showing the locations of the boreholes drilled during the investigation. Trace concentrations of TPH-diesel and TPH-heavy oils were detected during the investigation in soil and water, however no exceedances of the MOE Guidelines for Use at Contaminated Site in Ontario (February 1997) – Table B non-potable groundwater criteria for commercial/industrial land use, were detected. The available soil and groundwater quality data described in this report were reviewed but could not be compared to currently applicable residential property use standards due to the regulation (O.Reg 153/04) use of the PHC (F1-F4) system rather than TPH.

2.2.2 Phase One ESA

Golder conducted a Phase One ESA entitled, "*Phase One Environmental Site Assessment Lincoln Fields, Ottawa, Ontario*", dated February 2018, to assess the likelihood of soil and/or groundwater contamination resulting from historic or present activities at the Site and surrounding area. This included a review of available historical information on the Site and surrounding area, interviews with persons familiar with the Site and a Site reconnaissance. The APECs identified in the 2018 Phase One ESA are summarized in the following table:

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Site	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1 - Potential for soil and groundwater impacts due to the presence of a transformer vault on the Site.	See Figure 1	A transformer vault is located in the northeast corner of the shopping centre.	On-Site	PHCs/BTEX, PCBs	Soil and Groundwater
APEC 2 - Potential for soil and groundwater impacts due to the presence of a pad-mounted transformer on the Site.	See Figure 1	Pad-mounted transformer located on the southwestern parking lot, north of the Wendy's on the Site.	On-Site	PHCs/BTEX, PCBs	Soil and Groundwater
APEC 3 - Potential for soil and groundwater impacts due to the presence of a hydraulic oil AST associated with the hydraulic elevator.	See Figure 1	Hydraulic oil AST located in the center of the shopping centre.	On-Site	PHCs/BTEX	Soil and Groundwater
APEC 4 - Potential for soil and groundwater impacts due to suspected former dry cleaning activities within the Phase One Property.	See Figure 1	Suspected former dry cleaning facility on the Phase One Property. There is a current dry cleaning drop off depot on-Site.	On-Site	VOCs	Soil and Groundwater

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern on Site	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 5 - Potential for soil and groundwater impacts due to the presence of a bulk storage AST, former oil water separator, and former auto servicing activities.	See Figure 1	Former Walmart auto service bays in the northeast corner of the shopping centre. AST along east side of the service bays, oil water separator under west side of the service bays.	On-Site	PHCs/BTEX	Soil and Groundwater
APEC 6 - Potential for soil and groundwater impacts due to the presence of a waste oil AST with visible staining.	See Figure 1	Waste oil AST located on the sidewalk outside the former Walmart service bays in the northeast of the Site.	On-Site	PHCs/BTEX	Soil and Groundwater
APEC 7 - Potential for soil and groundwater impacts due to the presence of fill of unknown quality beneath the Site.	See Figure 1	Fill underlies the asphalt and buildings across the Site.	On-Site	PHCs/BTEX Metals	Soil
APEC 8 - Potential for soil and groundwater impacts due to the former presence a retail fuel outlet and garage/	See Figure 1	A retail fuel outlet with associated fuel USTs and a garage were formerly located within the Phase One Study Area; approximately 15 m northwest of the Site.	Off-Site	PHCs/BTEX	Soil and Groundwater

Notes
PCA - potentially contaminating activity as listed O.Reg. 153/04, Schedule D, Table 2
PHC - petroleum hydrocarbon compound fractions
PAH - polycyclic aromatic hydrocarbon
VOC - volatile organic compound
BTEX - benzene, toluene, ethylbenzene, xylenes

This report was prepared by the Qualified Person and will be relied upon for the Phase Two investigation.

3.0 SCOPE OF THE INVESTIGATION

The primary objectives of this Phase Two ESA were to assess the absence or presence of the contaminants of concern in relation to the potential environmental concerns identified in the Phase One ESA completed by Golder, to characterize the subsurface conditions at the Phase Two Property and to determine if soil and groundwater quality at the Site meet the applicable site condition standards. In addition, to delineate the horizontal and vertical extent of the subsurface impacts in soil and groundwater (if present) at the Site during the Phase Two ESA. To achieve the objectives of the Phase Two ESA, the location of the boreholes and monitoring wells and the parameters for chemical analysis of soil and groundwater samples were selected to assess the quality of soil and groundwater at the Site in relation to the APECs and PCAs identified in the 2018 Phase One ESA completed by Golder. The rationale for the soil and groundwater sampling locations, and the parameters for analysis of soil and groundwater samples is provided in the Sampling and Analysis Plan in Appendix B.

3.1 Overview of Site Investigation

The Phase Two ESA work was completed in three stages. The first stage of the Phase Two ESA work was completed in the north east part of the Site in the former Walmart in July 2017, the second stage was completed in southwest portion of the Site in November-December 2017, and the third stage for the remaining part of the Site in January-March 2018. The Phase Two was completed in conjunction with a geotechnical investigation completed on the Site as part of the proposed Site redevelopment. As such, select boreholes were completed beyond the depth of environmental interest for geotechnical purposes and required rotary coring methods to achieve the final depth. Bedrock coring was done at select locations for geotechnical purposes only and are therefore not discussed in the Phase Two ESA report.

The Phase Two ESA included the following tasks:

- **Health and Safety Plan**: Preparation of a Health and Safety Plan for internal and subcontractor use prior to initiating any field work at the Site.
- **Utility Clearances**: Prior to drilling, Golder arranged for the completion of public and private utility clearances. A private utility location contractor (USL-1 Inc.) was retained to identify private and public utilities within the work area, to mark the locations of the utilities and clear the proposed drilling locations.
- **Borehole Advancement and Monitoring Well Installation**: The borehole drilling program included drilling of 13 boreholes identified as BH17-01, BH17-06, BH17-08, BH17-19, BH17-20, BH17-21, BH17-23, BH17-24 BH17-25, BH17-101, BH17-108, BH17-109, and BH17-111, in and around the eight APECs identified at the Site. Nine of the 13 boreholes were completed as groundwater monitoring wells identified as MW 17-01, MW 17-06, MW17-08, MW17-19, MW17-20, MW17-21, MW17-25, MW17-101, MW17-108 to investigate the potential for groundwater impacts associated with the APECs identified on the Site. Additionally, two wells, identified as MW02-5 and MW02-6 remaining from the 2002 Golder investigation, were found to still be functional, and were also used to assess groundwater impacts. The rationale for the selected location of the boreholes is provided in the Sampling and Analysis Plan provided in Appendix B. The location of the boreholes and monitoring wells are shown on Figures 1 to 3. The monitoring well construction details are presented in Table 1 following the text of this report.

- **Equipment Used:** The drilling equipment used for borehole drilling varied throughout the project. During the July 2017 and January/February 2018 phases of drilling, a truck mounted drill rig CME-75, supplied and operated by Grenville Drilling ("Grenville") of Grenville, Quebec was used. During the November 2017 phase of drilling a truck mounted drill rig CME-55, supplied and operated by CCC Geotechnical & Environmental Drilling Ltd. (CCC) of Ottawa, Ontario was used.

  Grenville and CCC are licensed as a well contractor by the Ontario Ministry of the Environment and Climate Change (MOECC).

- **Soil Sampling**: Soil samples were collected from the boreholes and selected soil samples (based on visual and olfactory observations, soil vapour readings, and/or from depth horizons at which potential contamination was considered most likely to have occurred) were submitted for chemical analysis of one or more of the following chemicals of concern (COCs); petroleum hydrocarbons fraction 1 to fraction 4 ("PHCs F1-F4"), benzene, toluene, ethylbenzene, xylenes (BTEX), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), metals, pH, and/or polychlorinated biphenyls (PCBs). In total, 29 soil samples (including three (3) duplicate soil samples) were submitted for laboratory analysis of the COCs.

- **Groundwater Monitoring and Sampling**: Groundwater samples were collected from the 11 monitoring wells and submitted for analysis of one or more of the following COCs: PHCs F1-F4, VOCs, and/or PCBs. In total 13 groundwater samples (including two (2) duplicate groundwater samples) were submitted for laboratory analysis of the COCs. Static groundwater levels were measured in the monitoring wells located on the Site on March 7, 2018.

- **Surveying**: An elevation survey relative to a geodetic benchmark was completed for the boreholes and monitoring wells advanced as part of the Phase Two ESA investigation. The survey was completed on March 7, 2018.

- **Reporting**: Golder compiled and assessed the field and laboratory results from the above noted activities into this report.

The Phase Two ESA was conducted in accordance with O. Reg. 153/04 (as amended) and followed the framework of the Sampling and Analysis Plan, included as Appendix B. Subsurface investigation activities as summarized in this report were carried out in general accordance with Golder's Standard Operating Procedures (SOPs), which conform to the requirements of O. Reg. 153/04 and Golder's Quality Assurance Program. The data from the Phase Two ESA investigation completed by Golder at the Site were incorporated into a single Phase Two ESA report following the Phase Two ESA report format required under O. Reg. 153/04 (as amended).

The rationale/purpose for selecting the borehole locations, samples collected and associated rationale, chemical analysis performed, sampling procedures, QA/QC, etc., as required under O. Reg. 153/04, is provided in the Sampling and Analysis Plan included in Appendix B.

There were no impediments or access limitations that would affect the conclusions of this Phase Two ESA report.

3.2 Media Investigated

To address the APECs identified in the Phase One ESA, the Phase Two ESA field program included sampling of subsurface and surface soil from the 13 boreholes and sampling of groundwater from the 11 wells screened within the overburden at the Site. No sediment was present at the Site and therefore no sediment sampling was completed. A summary of the samples collected from each media investigated (soil and groundwater) and submitted for laboratory analysis of the COCs is provided in Tables 2 and 3 following the text of this report.

Details of the number and locations of boreholes and monitoring wells, number of samples, media and parameters investigated at the Phase Two Property are presented in the Sampling and Analysis Plan provided in Appendix B. The locations of the boreholes and monitoring wells used to form the basis for the Phase Two ESA are shown on Figures 1.

3.3 Phase One Conceptual Site Model

The Phase One ESA Conceptual Site Model (CSM), described below, is based on the results of the 2018 Phase One ESA investigation.

- The Site consisted of an approximately 6.6 hectares (16.2 acres) parcel of land. It was occupied by parking lots and three buildings including a Pizza Pizza Restaurant, a Wendy's restaurant and the Lincoln Fields Shopping Centre. Historically, the Site was developed around 1972 with the shopping centre, and prior to 1972 was used as agricultural land.
- No water bodies were identified on the Site. The Ottawa River is located approximately 850 m north of the Site. No areas of natural significance were identified on or within the Phase One Study Area;
- Ten (10) records of borehole from the 2002 Phase Two ESA conducted by Golder, indicate that the stratigraphy at the Site is sand and gravel fill underlain by native sand in the western portion of the Site and native clay and silt in the eastern portion of the Site, which is underlain by dolostone and sandstone bedrock. The static water level is between 2 and 4 mbgs;
- The Site was used as a vehicle garage and is suspected to have operated as a dry cleaning facility. As such, the Site is considered to be an enhanced investigation property; and,
- At the time of the Phase One ESA, the surrounding properties within the Phase One Study Area consisted of residential and commercial (mixed use) land uses. There are indications that surrounding properties in the Phase One Study Area were/are used for the following commercial uses: vehicle garage, bulk liquid dispensing facility, and/or dry cleaning facilities.
- PCAs and were identified in the Phase One Study Area as follows:

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
Site	***#18. Electricity Generation, Transformation and Power Stations –*** The transformer vault for Lincoln Fields Shopping Centre in the northeast corner of the building.	Site Reconnaissance	This PCA is located on-Site. Given that the transformers were located in concrete vaults that reportedly had deficient maintenance, access to the transformer vault was unavailable, the state of the original transformers at removal is unknown, and the age of the original transformers (1970's), it is considered to contribute to an APEC on-Site.
	#18. Electricity Generation, Transformation and Power Stations – One pad-mounted transformer was located in the parking lot on the southwest portion of the Site north of Wendy's.	Site Reconnaissance	This PCA is located on-Site and therefore must be considered to contribute to an APEC.

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
	#28. Gasoline and Associated Products in Fixed Tanks – The shopping centre is serviced by one hydraulic lift elevator, with associated hydraulic oil tank, located in the middle of the mall.	Site Reconnaissance, Site Representative	This PCA is located on-Site and therefore must be considered to contribute to an APEC.
	#37. Operation of Dry Cleaning Equipment (where chemicals are used) – Review of HLUI and Street directories indicates the presence a dry cleaner on-Site. The cleaners currently on-Site are only a drop-off depot.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder), Street Directories, HLUI	While the Site representative and previous reports indicate that the on-Site cleaners have always been a depot, it is considered unlikely that this is the case based on the years of the activity (as early as 1976). The exact location of the 1976 cleaners is unknown. As such, this PCA is considered to contribute to an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops – The former Walmart had vehicle servicing bay in the northeast corner of the store operated as a garage for decades. A bulk storage AST in the service bay was identified, as well as an underground oil water separator.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder), HLUI, EcoLog ERIS Report	Due to the presence of ASTs on the Site, as well as the service bay's long operating life as a garage (>30 years in operation), and the PCA's location on-Site, it is considered to contribute to an APEC on-Site.
Site	***#28. Gasoline and Associated Products in Fixed Tanks –*** A waste oil AST was identified in an enclosure outside the former Walmart auto service bays.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder)	Given this PCA's location on-Site, as well as the staining noted to the east of the tank, this PCA is considered to contribute to an on-Site APEC.
	#30. Importation of Fill Material of Unknown Quality – The Site was graded with fill of unknown origin during the construction of the shopping centre in 1972.	Site Reconnaissance, Previous Environmental Reports (Golder)	Given this PCA's location across the Site, this PCA is considered to contribute to an APEC on-Site.
Phase One Study Area (excluding the Site)	***#28. Gasoline and Associated Products in Fixed Tanks –*** 1386 Richmond Road. A former gasoline service and automotive repair station (15 m northwest of the Site) is known to have had USTs while in operation as a gas station. There was also automotive repair works conducted at this property.	EcoLog ERIS Report, Previous Environmental Reports (Golder)	This PCA is located off-Site. But given its close proximity to the Site (<15 m) and the former presence of gasoline USTs, the PCA is considered to represent an APEC on Site.

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
	#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops 2599 Carling Avenue. A former gasoline service station and automotive repair station (100 m west of the Site) is known to have had USTs while in operation as a gas station. There is also automotive repair works and automotive wholesale conducted at this property.	EcoLog ERIS Report, Site Reconnaissance, Aerial Images, City Directories, HLUI	The PCA is separated from the Site by 100 m including Croydon Avenue and its underlying utilities. It is also hydraulically cross-gradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks - The former Sunoco Service Station (150 m west of the Site) is known to have had USTs while in operation as a gas station.	EcoLog ERIS Report	The PCA is separated from the Site by 150 m including Croydon and Forest Street and their underlying utilities. It is also hydraulically cross-gradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks and #10 Commercial Autobody Shops – 1325 Richmond Road. Former gas station with a UST, automotive wholesalers and automotive repair shops, namely Shell and currently Approval Genie, have been/are present north of the Site (approximately 50 m north of the Site.)	City Directories, EcoLog ERIS Report, HLUI	This PCA is separated from the Site by 50 m including Richmond Road and its underlying services. It is also hydraulically downgradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks and #10 Commercial Autobody Shops – 1377 Richmond Road. Current and historical automotive wholesaler and repair shop. Records indicate a waste oil UST was removed from the property. Approximately 50 m north of the Site.	Ecolog ERIS Report, City Directories, HLUI	Based on its close proximity adjacent to the Site, and its hydraulically upgradient location with respect to the Site, this PCA this is considered to represent an APEC.
	#10 Commercial Autobody Shops – 365 Forest Street. A former and current automotive repair shop; approximately 100 m west of the Site.	City Directories, Ecolog ERIS Report.	This PCA is separated from the Site by 100 m including Croydon Avenue and its underlying services. As such, it is not considered to be a PCA that will result in an APEC on the Site.

- Underground utilities are known to be present at the Site;
- Soil at the Site consists two primary types: medium grained stratified sand and some silt in the form of fluvial terraces and channels cut in marine clay, and clay and silt underlying erosional terraces. Bedrock at the Site consists of Beekmantown Group of dolostone and sandstone. Drift thickness in the area is estimated to be 5 to 10 metres; and,

- Local groundwater flow is anticipated to flow to the northeast in the north half of the Site, and south in the south half of the Site, and regional groundwater flow is expected to flow to the north towards the Ottawa River.

3.4 Deviations from Sampling and Analysis Plan

A sampling and analysis plan is provided in Appendix B which incorporates the investigation program completed in July 2017, November-December 2017 and January-March 2018. The sampling and analysis plan outlines the rationale for the field investigation activities carried out at the Site and the associated methodologies used to meet the objectives of this Phase Two ESA. This plan was prepared prior to the field investigation and outlines the activities undertaken during the Phase Two ESA. The procedures described in the Sampling and Analysis Plan were followed, with the exception of groundwater sampling of MW17-20 which was inaccessible during groundwater sampling periods. There were no other deviations from the SAP.

3.5 Impediments

No impediments to the Phase Two ESA investigation were encountered.

4.0 INVESTIGATION METHOD

4.1 General

The following sections describe the pre-field work activities and field investigation methodology employed during the Phase Two ESA conducted at the Phase Two Property. The field investigation methods were carried out in accordance with Golder's Quality Assurance Program and the SOPs. The fieldwork was conducted in three stages. The first stage was completed in July 2017, the second stage was completed in November-December 2017, and the third stage was completed in January-March 2018. Field methodologies described below include borehole drilling, soil sampling, field screening, groundwater monitoring well installation, measurement of groundwater levels and water quality parameters and groundwater sampling. Details of analytical testing, residue management, elevation surveying and Quality Assurance / Quality Control (QA/QC) measures are also included below.

Prior to initiating the field work, Golder developed and implemented Site-specific protocols to protect the health and safety of its employees and subcontractors through the preparation of a Site-specific Health and Safety Plan. An assessment of potential health and safety hazards at the Phase Two Property and those associated with the proposed work was completed each day of the field program. A health and safety tail gate meeting was held with Golder's subcontractors each day prior to completion of the field work. The document was reviewed and signed on-Site by field personnel prior to commencing work. Additionally, prior to any intrusive investigations, including drilling, Golder retained USL-1 Inc. of Ottawa, Ontario to coordinate utility clearances with the local utility companies and to clear boreholes locations.

4.2 Drilling

As per the SAP, 13 boreholes (BH17-01, BH17-06, BH17-08, BH17-19, BH17-20, BH17-21, BH17-23, BH17-24 BH17-25, BH17-101, BH17-108, BH17-109, and BH17-111) were advanced at the Site. Borehole locations are provided in Figure 1. Boreholes were advanced by Grenville Drilling (Grenville) using a CME-75 truck mounted drill rig, or by CCC Geotechnical & Environmental Drilling Ltd. (CCC) using a CME-55 truck-mounted drilling rig. The borehole drilling and monitoring well installation activities were monitored in the field by an experienced Golder technician. During borehole drilling, overburden soil samples were collected continuously at 0.61 m intervals using a 0.61 m long, 50 mm (2 inch) diameter drive open stainless-steel casing ("split spoon") sampling system.

The drill rig was equipped with a 63.5 kg sampler hammer that was used to advance the split spoon into the ground and collect a discrete soil sample. The split spoon sampler was cleaned with Alconox soap and methyl hydrate then rinsed with distilled water between each sample.

During borehole drilling, overburden soil samples were collected using split spoon soil sampling equipment and augered using 200 mm outside diameter ("OD") solid stem augers. Continuous soil samples were collected using the following method:

- Split-spoon: 0.61 m (2 foot) long, 5.08 cm (2 inch) diameter stainless steel split spoon sampling system at 0.76 m long intervals. Split-spoons were decontaminated between sample locations.

Select boreholes were extended beyond the depth of environmental interest for geotechnical purposes. Bedrock coring was done at select locations for geotechnical purposes only and are therefore not discussed in the Phase Two ESA report.

4.3 Soil: Sampling

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

The subsurface soil conditions within the boreholes were described in terms of their texture, presence of staining, odour and debris, if any. Geologic descriptions of soil samples are presented in the Record of Borehole sheets (Appendix C).

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

Soil samples submitted for chemical analysis were based on visual or olfactory observations (e.g., staining, discolouration, free product, and/or odour, if any), from representative soil layers, and/or from depth horizons at which potential impact would most likely have occurred, such as near the water table. Otherwise, if no visual or olfactory observations were noted, the highest recorded field screening reading and/or depth horizons at which potential contamination was considered most likely to have occurred was used to determine which soil sample to submit for analysis from each test location.

Visual and olfactory observations and results of soil headspace measurements are presented on the Record of Borehole sheets provided in Appendix C.

4.4 Field Screening Measurements

Field measurements of sample headspace concentration were made using the following equipment:

Stage of Field Program	Equipment	Parameters Detected	Detection Limits	Precision	Accuracy	Calibration Standard	Calibration Procedure
First Stage	Photo-ionization detector (PID) RKI Eagle 2	Organic vapours & Combustible Vapours	0 – 2,000 ppm & 0 – 50,000 ppm	N/A	+/- 5%	100 ppm Isobutylene & 100 ppm Hexane	By supplier prior to fieldwork & by Golder Associates field staff during work
Second Stage	Photo-ionization detector (PID) UltraRae 3000 10.6 EV bulb	Organic vapours	0 - 10,000 ppm	N/A	+/- 3%	100 ppm Isobutylene	By supplier prior to fieldwork & by Golder Associates field staff during work
Third Stage	Photo-ionization detector (PID) UltraRae 3000 10.6 EV bulb	Organic vapours	0 - 10,000 ppm	N/A	+/- 3%	100 ppm Isobutylene	By supplier prior to fieldwork & by Golder Associates field staff during work

The PIDs were used to provide an estimate of the relative concentrations of organic vapours in the headspace of each soil sample and was used to support selection of soil samples for submission for laboratory analysis. The selection of “worst case” soil samples submitted for laboratory analysis of the COCs was based on professional judgement which included a consideration of the highest organic vapour readings, visual and olfactory evidence of potential contamination (PHC odour, presence of debris) and the depths of the soil sample collection (depth horizons at which potential impact would most likely have occurred, such as from the upper fill layer or near the water table).

The results of soil headspace screening measurements are provided in the Record of Boreholes in Appendix C.

4.5 Groundwater: Monitoring Well Installation

Following the completion of drilling and soil sampling at the 13 borehole locations, nine of the 13 boreholes were completed with monitoring wells. BH17-01, BH17-06, BH17-08, BH17-19, BH17-20, BH17-21, BH17-25, BH17-101, and BH17-108 were installed with monitoring wells. The depth of the screens of the monitoring wells were selected to intersect the water table in order to capture any PHC contamination from APECs 1 - 8 with the exception of APEC 5.

All monitoring wells were installed by Grenville and CCC using threaded 32 mm diameter, schedule 40, polyvinyl chloride (PVC) well screens and riser pipe, which were brought to the Site in sealed plastic bags. The annulus surrounding the screened portion of the well and an approximately 0.2 to 0.7 m portion of the riser pipe above the slotted pipe was filled with silica filter sand. A bentonite seal was placed above the sand filter pack with a minimum thickness of 0.3 m. The monitoring wells were completed with a flush mount protective well casing set in concrete and the riser pipes were sealed with a protective cap.

The monitoring wells were developed following the drilling of stages two and three of the Phase Two ESA by removing up to ten well volumes or by removing groundwater until the well was purged three times dry, using dedicated Waterra® inertial pumps (polyethylene tubing with foot valves). The monitoring wells installed during the second stage of the Phase Two ESA (MW17-08, MW17-101, and MW17-108) were developed on December 8, 2017 and those installed during the first and third stages of the Phase Two ESA as well as those installed during the 2002 investigation (MW17-01, MW17-06, MW17-19, MW17-20, MW17-21, MW17-25, MW02-5, and MW02-6) were developed on February 27 and March 21, 2016. During monitoring well development, qualitative observations were made of water colour, clarity, and the presence or absence of any hydrocarbon sheen or odours.

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

4.6 Groundwater: Field Measurements for Water Quality Parameters

Groundwater indicator parameters including temperature, pH, conductivity, oxidation-reduction potential (ORP) and dissolved oxygen were measured prior to sampling to ensure adequate well development and purging. A water quality meter was used to measure groundwater quality during monitoring well development and groundwater sampling.

During the first and third stage water sampling, with the exception of MW17-01 and MW17-21, of the Phase Two ESA, the type of water quality meter used was an In-Situ smarTROLL. The instrument wes calibrated using factory supplied solutions for electrical conductivity, pH, turbidity, dissolved oxygen, temperature and ORP parameters. The smarTROLL unit was supplied and calibrated by Pine Environmental. Specifications of the units for each parameter are outlined in the following table:

Parameter	Range	Resolution	Accuracy
pH	0.00 to 14.00 pH	0.01 pH	±0.1 pH
Conductivity	0.00 to 100 mS/cm	0.0001 mS/cm	± 0.5%
Temperature	-5 to 50 ºC	0.01 ºC	± 0.1 ºC
Dissolved Oxygen	0 to 50 mg/L	0.01 mg/L	± 0.2%
Oxidation-Reduction Potential	± 1400 mV	0.1 mV	± 5 mV

During the second stage of the Phase Two ESA, the type of water quality meter used was a Horiba U-52. The Horiba U-22 was supplied and calibrated by Pine Environmental. The instrument was calibrated using factory supplied solutions for electrical conductivity, pH, turbidity, dissolved oxygen, temperature and ORP parameters. Specifications of the Horiba U-52 for each parameter are outlined in the following table:

Parameter	Range	Resolution	Accuracy
pH	0.00 to 14.00 pH	0.01 pH	±0.1 pH
Conductivity	0.00 to 100 mS/cm	0.01 mS/cm	± 0.1%
Temperature	-5 to 55 ºC	0.01 ºC	± (0.3 + 0.005*absolute value of temperature) ºC
Dissolved Oxygen	0 to 50 mg/L	0.01 mg/L	± 0.1%
Oxidation-Reduction Potential	-2000 to +2000 ORP	0.1 mV	± 15 mV

4.7 Groundwater: Water Level Measurement and Sampling

Prior to the groundwater sampling, the water levels were recorded and the potential presence of free product was measured in all eleven monitoring wells using an oil/water interface probe supplied and calibrated by Pine Environmental. The water level measurements and the groundwater sampling were completed more than 24 hours after the well development was completed. The water level measurements were taken from the top of the PVC riser and are summarized in Table 1 following the text of this report. The water levels measured between 1.58 mbgs and 6.01 mbgs.

Following the water level measurement and prior to the groundwater sampling the wells were purged by using a peristaltic pump. During the well purging, qualitative observations were made of water colour, clarity, the presence or absence of any hydrocarbon sheen and any odours present. Free phase product, odour or sheen were not observed in any the monitoring wells during the groundwater purging or sampling. Groundwater sampling of the monitoring wells (MW17-08, MW17-101, and MW17-108) installed during the second stage of the Phase Two ESA was carried out on December 11, 2017 and the groundwater sampling of the monitoring wells (MW17-01, MW17-06, MW17-19, MW17-20, MW17-21, MW17-25, MW02-5, and MW02-6) installed during the first and third stages of the Phase Two ESA, as well as during the 2002 investigations, was carried on February 27-28, 2018, March 7, 2018, and March 21, 2018.

The monitoring well purging and groundwater sampling was conducted using the low flow procedure. This method involved purging each well at a constant pumping rate (between 0.1 and 1 L/min) using dedicated 6.3 mm (1/4 inch) diameter low density polyethylene (LDPE) tubing attached to a peristaltic geo-pump. Multi-parameter water meter (In-Situ smarTROLL and Horiba U-22) was used to measure groundwater temperature, pH, ORP, DO and conductivity during purging and prior to sampling. One groundwater sample was collected from each of the monitoring wells after the water quality parameters and water level stabilized over three successive measurement intervals. Disposable nitrile gloves were worn at all times by the technician to handle the groundwater samples. A dedicated pair of gloves was used for each sample collected to minimize the risk of cross-contamination between samples and potential contaminant exposure to field staff. During the well purging, qualitative observations were made of water colour, clarity, the presence or absence of any hydrocarbon sheen and any odours present. No free product was noted during the groundwater purging or sampling.

Following purging, groundwater samples were collected into the laboratory provided sample bottles, placed in a cooler on ice and delivered under chain-of-custody procedures to AGAT. The groundwater samples were analyzed for one or more of the following parameters: PHC F1, PHCs F2-F4, BTEX, VOCs, and/or PCBs following chain-of-custody procedures. Details of the parameters analyzed at each monitoring well are presented in Table 3.

4.8 Sediment: Sampling

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

4.9 Analytical Testing

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

AGAT Laboratories
5835 Coopers Avenue
Mississauga, Ontario, L4Z 1Y2
Laboratory Contact: Mazen Hussein
905-712-5106

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

4.10 Residue Management Procedures

All residues produced during the investigation (soil cuttings from drilling, groundwater from well development purging, wash water from equipment decontamination) were placed in sealed drums and temporarily stored on-Site. Upon receipt of analytical results, all residues were disposed of off-Site.

4.11 Elevation Surveying

An elevation survey of boreholes and monitoring wells was completed on March 21, 2018. Elevations were determined relative to the surface the parking lot, marked with a dot of survey paint, directly in front of the second most west garage bay door for former Walmart.

4.12 Quality Assurance and Quality Control Measures

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

- The use of standard operating procedures for all field investigation activities;
- All monitoring wells were developed following installation to remove fine particles from the filter pack and any fluids introduced during drilling;
- Monitoring wells were appropriately purged prior to groundwater sample collection to remove stagnant water from the well bore and improve sample representativeness, minimizing sample agitation and aeration to the extent practicable;
- The collection of field duplicate samples at a minimum frequency of one duplicate for every ten samples;

- Submission of one trip blank for laboratory analysis of VOCs during each of the groundwater sampling events completed during all stages of the Phase Two ESA. The trip blanks were supplied and sealed by the laboratory, were brought to the Site and then shipped back to the laboratory unopened for analysis of VOCs.
- Initial calibration of field equipment was performed at the start of each field day, with daily checks of calibration, as needed, using a standard of known concentration;
- Soil and groundwater samples were handled and stored in accordance with the sample collection and preservation requirement of the Ministry of the Environment (MOE) *Protocol for Analytical Methods Used in the Assessment of Properties Under Part XV.I of the Environmental Protection Act*, July 1, 2011. Samples were collected directly into pre-cleaned, laboratory-supplied sample containers with the appropriate preservative for the analyte group. Upon collection, samples were placed in insulated coolers with ice for storage and transport to the analytical laboratory under chain-of-custody;
- Dedicated sampling equipment (tubing and foot valves) and clean disposable Nitrile™ gloves were used at each sampling location to prevent cross-contamination. All non-dedicated sampling equipment (e.g., water level meters, split spoons) was decontaminated between sampling locations. Sampling equipment in contact with soil, groundwater, or sediment was: cleaned by mechanical means; washed with a laboratory-grade detergent (e.g., phosphate-free LiquiNox or AlcoNox) and, if necessary, an appropriate desorbing wash solution; and thoroughly rinsed with analyte-free water;
- Detailed field records documenting the methods and circumstances of collection for each field sample were prepared at the time of sample collection. Each sample was assigned a unique sample identification number recorded in the field notes, along with the date and time of sample collection, the sample matrix, and the requested analyses; and,
- The submission of samples to the analytical laboratory in accordance with standard chain of custody procedures.

Below is a summary of the primary and duplicate samples collected during each stage of the Phase Two ESA (i.e., between October 2015 and February 2016).

Stage of Phase Two ESA	Drilling Dates	Soil Samples Collected	Duplicates
First Stage	July 17 – 21, 2017	17-6 (SA-4), 17-6 (SA-7), 17-19 (SA1), 17-19 (SA4), 17-23 (SA-2), 17-23 (SA-4), 17-24 (SA-1), 17-24 (SA-5), 17-25 (SA-3), and 17-25 (SA-6) **Total of 10 samples**	17-23 (SA-14) (duplicate of 17-23 (SA-4))
Second Stage	November 28 – 29, 2017	17-08 SA1, 17-08 SA4, 17-101 SA1, 17-101 SA 4, 17-108 SA3, and 17-108 SA7 **Total of 6 samples**	17-101 SA44 (duplicate of 17-101 SA4)
Third Stage	February 13 – 22, 2018	17-01 SA3, 17-01 SA4, 17-20 SA2, 17-20 SA5, 17-21 SA1, 17-21 SA2, 17-21 SA3, 17-21 SA5, 17-109 SA4, and 17-111 SA3 **total of 10 samples**	17-20 SA22 (duplicate DUP)

Stage of Phase Two ESA	Groundwater Sample Date	Groundwater Samples Collected	Duplicates
First and Third Stages	February 27 – March 21, 2018	17-01, 17-06, 17-19, 17-21, 17-25, 02-5, and 02-6 **total of 8 samples**	DUP026 (duplicate of 02-6)
Second Stage	December 11, 2017	17-08, 17-101, and 17-108 **total of 3 samples**	DUP1 (duplicate of 17-08)

5.0 REVIEW AND EVALUATION

This section of the report presents a review and evaluation of the results of the drilling, monitoring and sampling activities conducted as part of the Phase Two ESA.

5.1 Geology

The soil conditions encountered during the borehole drilling are presented in the Record of Borehole sheets and provided in Appendix C. The following presents a summary of the subsurface soil conditions encountered during the investigation.

In general, the pavement structure within the project limits consists of asphaltic concrete overlying granular base/subbase. The asphaltic concrete is underlain by a 60 millimetre thick layer of recycled asphalt product (RAP). The composition of the granular base and subbase varies between angular sandy gravel (i.e., crushed stone), gravelly sand, and sand and gravel with some fines. Heterogeneous fill exists beneath the pavement structure at all of the boreholes advanced. The composition of the fill is variable, consisting of sand, silty sand, clayey silt, and silty clay with varying amounts of gravel, concrete chunks, asphalt and organic matter. The fill extends to depths ranging from about 1.1 to 6.9 metres below the existing ground surface.

A layer of silty sand to sandy silt was encountered below the fill in boreholes in the southwest corner of the property. This layer was encountered at a depth of about 2.1 to 3.8 metres and extends to a depth of about 3.1 to 4.7 metres below the existing ground surface.

A thick deposit of sensitive silty clay was encountered beneath the fill and silty sand (where present). At all boreholes, the upper portion of the silty clay has been generally weathered to a grey brown colour (i.e., weathered crust) and extends to depths ranging from about 2.6 to 6.9 metres below the existing ground surface. The silty clay below the weathered crust, where encountered, is grey in colour. The lower grey silty clay extends to depths of between about 3.8 to 6.4 metres below the existing ground surface.

In boreholes that were extended to greater depths, a deposit of glacial till was encountered below the silty clay. The where the glacial till was penetrated it extends to depths of about 11.6 and 13.7 metres below the existing ground surface. In general, the glacial till consist of a heterogeneous mixture of cobbles, boulders, and gravel in a matrix of silty sand to sandy silt.

A layer of native sand was encountered below the glacial till in borehole 17-8. The sand was encountered at a depth of about 6.7 metres but was not fully penetrated and its full thickness was not confirmed. However, this layer was proven to a depth of about 7.6 metres below the existing ground surface

The fill and silty sand layers are the hydrostratigraphic units which are located at a depth between 0.5 and 6.9 mbgs. Underlying the silty sand later is a silty clay layer that limits the potential for downward migration of potential groundwater impacts at the Site. Both the silty clay and the glacial till units are not considered to be water bearing formations at the Phase Two Property.

5.2 Groundwater: Elevations and Flow Direction

A full round of water level measurements at all wells, with the exception of MW17-19, was completed on March 21, 2018. As such, an interpretation of the groundwater flow direction was created based upon the water level measurement completed on March 21, 2018. The water levels were measured more than 24 hours after monitoring well development. Details of the groundwater flow are discussed in the paragraphs below.

The screens of all eleven monitoring wells were installed between 0.91 and 6.10 mbgs with the exception of MW17-108 which was located approximately four metres higher than the other wells and was screened from 6.10 – 9.15 mbgs. All monitoring wells installed during the Phase Two ESA were used for the interpretation of the groundwater flow direction within the fill/silty sand layer based on the water level measurements on March 21, 2018. An exception was MW7-19 which could not be accessed at the time of groundwater measurement. The static groundwater levels measured on March 21, 2018 in these ten accessible monitoring wells were between 0.91 and 6.10 mbgs or at elevations 96.08 metres above bench mark (mABM) (MW17-01) and 100.55 mABM (MW17-08). Based on the water level elevations measured in the ten monitoring wells at the Site on March 21, 2018, the shallow groundwater flow direction at the Site is generally interpreted to be in a north northeast direction, consistent with previous information.

The groundwater elevations measured at the ten shallow monitoring wells and the interpreted groundwater flow directions in the fill and silty sand based on the water levels measured on March 21, 2018 are shown on Figure 2.

Monitoring for free phase product using an interface probe was conducted on March 21, 2018. No evidence of petroleum hydrocarbon free product or sheen in groundwater was observed or measured.

The measured water levels and elevations for monitoring wells are presented on Table 2 following the text of the report and are shown on the Record of Borehole sheets.

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events seasonal trends could not be identified, however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

Any temporary fluctuation in water levels on the Phase Two Property is not anticipated to effect the conclusions of the Phase Two ESA.

5.2.1 Underground Utilities

There are shallow services throughout the Site for building services and parking lot storm drainage. The main utility lines are located off-Site in Croydon Avenue and Richmond Road and the main shopping centre connects to the utilities in Richmond Road. Underground utilities on the Site may influence the groundwater flow direction and migration of COCs in groundwater. However, there were no groundwater exceedances of MOECC Table 3 Standards at the Site and no indication of contaminant migration along the underground utilities within the site.

5.3 Groundwater: Hydraulic Conductivity, Hydraulic Gradients and Velocity

5.3.1 Hydraulic Conductivity

Based on known values for silty sand (Freeze and Cherry, 1979) the measured hydraulic conductivity at the Site for the silty sand/fill is approximately $1x10^{-7}$ m/s. This hydraulic conductivity value was used to calculate the groundwater velocity in the hydrostratigraphic units.

5.3.2 Horizontal Hydraulic Gradients

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions within the fill and silty sand based on water levels collected on March 21, 2018, and the inferred groundwater contours are presented on Figure 2. The horizontal hydraulic gradient for shallow groundwater conditions was calculated to be approximately 0.0146 m/m. Variability in hydraulic gradients calculated at the Phase Two property may be related to the presence of foundations/buried structure, bedding materials, and buried services at the Site.

5.3.3 Vertical Hydraulic Gradients

The vertical hydraulic gradients were not obtained as no groundwater contamination was detected,

5.3.4 Groundwater Velocity

The groundwater flow velocity can be calculated using the Darcy equation as follows:

$$V=ki/n_e$$

Where V =Groundwater flow velocity

k =Hydraulic conductivity

i =Horizontal hydraulic gradient

ne =Effective porosity

Based on the hydraulic conductivity of 1x10-7 m/s for silty sand, and a horizontal hydraulic gradient of approximately 0.0146 and porosities of 25% (max) to 49% (min) (for silty sand), the minimum and the maximum groundwater velocity within the silty clay is estimated to be approximately 1.84x10-1 m/year and 9.40x10-2 m/year, respectively. Note that actual groundwater velocity may vary significantly not only because of variability of the hydraulic gradient, but also because of variability of the hydraulic conductivity within the silty clay.

Based on the hydraulic conductivity of 1x10-7 m/s for glacial till, horizontal hydraulic gradients of 0.0011 (min) and 0.0035 (max) and a porosity of 40% (for glacial till), the minimum and the maximum groundwater velocity within the glacial till is estimated to be approximately 8.57x10-3 m/year and 2.76x10-2 m/year, respectively. Note that actual groundwater velocity may vary significantly not only because of variability of the hydraulic gradient, but also because of variability of the hydraulic conductivity within the glacial till.

5.4 Soil Texture

Based on laboratory grain size analysis, coarse soil texture was considered applicable for the Site.

5.5 Soil: Field Screening

Headspace vapour measurements were conducted on the soil samples collected from each borehole. Organic vapour measurements ranged from non-detect to 10.2 ppm (highest reading measured at 17-108 at a depth between 5.34 and 5.95 mbgs). Combustible vapour measurements ranged from non-detect to 15 ppm (highest reading measured at 17-6 at a depth between 1.83 and 2.44 mbgs).

The results of headspace vapour measurements are presented on the Record of Borehole sheets in Appendix C.

5.6 Soil: Quality

A summary of the soil samples submitted for analysis, the associated test parameters and the soil samples exceedances of the MOECC Table 3 R/I/P and MOECC Table 3 I/C/C Standards is provided in the Table 2 following the text of this report. The analytical results of the soil samples are presented in Tables 4A to 4C following the text of this report. Laboratory Certificates of Analysis for the soil samples are included in Appendix D.

Golder completed soil sampling at the Site during borehole advancement between July 2017 (first stage of the Phase Two ESA), November 2017 (second stage of Phase Two ESA), and January/February 2018 (third stage of the Phase Two ESA). The soil samples were submitted to AGAT for analysis of one or more of the following COCs: PHCs + BTEX, PAHs, VOCs, PCBs, pH, and/or metals.

A summary of the parameters, the number of soil samples analyzed and the number of soil samples exceeding the MOECC Table 3 R/I/P and MOECC Table 3 I/C/C Standards is provided below:

Parameter	Number of soil samples analysed	Number of soil samples exceeding the Table 3 R/I/P Standards	Number of soil samples exceeding the Table 3 I/C/C Standards
PHCs F1 to F4 and BTEX	26 (including 3 duplicate soil samples)	0	0
VOCs	21 (including 3 duplicate soil samples)	0	0
PCBs	5 (including one duplicate soil sample)	0	0
PAHs	9 (including one duplicate soil sample)	0	0
pH	7 (including one duplicate soil sample)	0	0
Metals	28 (including 3 duplicate soil samples)	0	0

The results of this Phase Two ESA indicate that no soil impacts were identified in any of the analyzed soil samples collected from the 13 boreholes completed within the eight APECs identified on the Site. The concentrations of the COCs (PHCs F1 to F4, VOCs, PAHs, metals, and PCBs) associated with the eight APECs were all below both the MOECC Table 3 R/I/P and MOECC Table 3 I/C/C Standards.

5.7 Groundwater: Quality

Monitoring well construction details are summarized in Table 1 and a list of groundwater samples submitted for laboratory analysis is provided in Table 3 following the text of this report. The analytical results for groundwater samples are summarized in Tables 5A through 5C, along with the applicable MOECC Table 3 Standards. Laboratory Certificates of Analysis for groundwater are provided in Appendix D.

A summary of the parameters analyzed, the number of groundwater samples analysed and number of groundwater samples exceeding the MOECC Table 3 Standards is provided below:

Parameter	Number of groundwater samples analysed from the shallow monitoring wells	Number of groundwater samples analysed from the deeper monitoring wells	Number of groundwater samples exceeding the 2011 Table 3 Standards
PHCs F1 to F4, BTEX	13 (including 2 duplicate groundwater samples	0	0
VOCs	13 (including 2 duplicate groundwater samples)	0	0
PCBs	4 (including 2 duplicate groundwater samples)	0	0

A review of the groundwater analytical results from the groundwater sampling completed during the Phase Two ESA indicated that the concentrations of the COCs (PHCs F1-F4, VOCs, and PCBs) associated with the eight APECs were below the laboratory detection limit or were at measured concentrations below the applicable MOE Table 3 Standards. The results show that the groundwater at the Site has not been impacted by the eight APECs.

In addition to numerical standards, the O.Reg.153/04 sets out non-numerical (aesthetic) standards relating to the petroleum hydrocarbons. Specifically, a property does not meet an applicable site condition standard in relation to a petroleum hydrocarbon unless the qualified person has determined that there is no evidence of free product, including but not limited to, any visible petroleum hydrocarbon film or sheen present in the ground water or surface water or in any ground water or surface water samples. Monitoring for free phase product using an interface probe was conducted on December 11, 2017 and March 21, 2018 during the groundwater sampling. No evidence of free product or sheen in groundwater was observed.

Therefore, the groundwater quality at the Site meets the applicable MOECC Table 3 Standards and is not contaminated in terms of the regulation.

5.8 Sediment: Quality

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

5.9 Quality Assurance and Quality Control Results

The quality assurance assessment of the field duplicate sample results was conducted according to the document entitled Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act, March 9, 2004 (amended in July 2009 and effective as of July 1, 2011) (“Analytical Protocol”).

To determine the precision of the analytical methods and field sampling procedures, blind duplicate samples were collected during the soil and groundwater sampling. Precision is determined by the relative percent difference ("RPD") between the duplicate and original samples and was calculated as follows:

$$RPD = \frac{|x_1 - x_2|}{x_m}$$

Where x^1 initial sample results

x^2 duplicate sample results

$^x m$ mean of x^1, x^2

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

The following RPD limits were considered reasonable and are based on Analytical Protocol: RPDs in soil, 30% for metals, 50% for VOCs, 30% for PHCs, 40% for PCBs and 40% for PAHs and in groundwater/surface water, 20% for metals, 30% for VOCs, 30% for PHCs, 30% for PCBs and 30% for PAHs.

RPDs could not be calculated for PHCs, PCBs, PAHs and VOCs in the original and duplicate soil samples, as these results were below the laboratory RDL. The calculated RPDs for the original and duplicate groundwater sample were less than 25% for metals which is considered to be within acceptable limits.

A trip blank was submitted for analysis of VOCs as part of the groundwater monitoring conducted at the Site during each groundwater sampling event of the Phase Two ESA. It is noted that the trip blank samples were found to have no detectable concentrations of VOCs. The quality of the analytical results is further supported by AGAT's internal quality assurance program that includes laboratory blanks, spikes, surrogates and duplicate samples.

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

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

5.10 Phase Two Conceptual Site Model

The Phase Two Conceptual Site Model (CSM) consists of a narrative description of the current condition of the Site and accompanying diagrams, cross-sections and Figures. The Phase Two conceptual site model is presented in the following sections and the Figures that comprise the Phase Two CSM include:

Figure 1: Site Plan

Figure 2: Groundwater Elevations and Interpreted Shallow Groundwater Flow Direction

Figure 3: Cross Section A-A'

Figure 4: Cross Section B-B'

5.10.1 Current and Historical Site Use and Surrounding Land Use

The Site is located at 2525 Carling Avenue, Ottawa, Ontario and consists of an approximately 6.6 hectares (16.2 acres) parcel of land that is occupied by three buildings including the Lincoln Fields Shopping Centre, a Wendy's Restaurant, a Pizza Pizza Restaurant, and associated parking lots. The surrounding properties within the Phase Two Study Area currently include residential, community and commercial (general mixed use) land uses.

Based on the aerial photographs, the majority of the Site was vacant land used for agriculture prior to the construction of the Lincoln Fields Shopping Centre in 1971. The 1952 aerial photograph shows that Site was used primarily for agriculture, with a few residential homes along the west side of the Site along Croydon Avenue. Therefore, it can be determined that the majority of the Site was first developed with the Lincoln Fields Shopping Centre in 1971. An exception is the western edge of the Site which was first developed with residential homes prior to 1952, and was later redeveloped with the Lincoln Fields Shopping Centre in 1971.

5.10.2 Potential Sources of contamination

5.10.2.1 Potentially Contaminating Activities

Based on the information obtained as part of the Phase One ESA, the following potentially contaminating activities (PCAs) were identified on Site and off-Site within the Phase One Study Area.

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
Site	***#18. Electricity Generation, Transformation and Power Stations –*** The transformer vault for Lincoln Fields Shopping Centre in the northeast corner of the building.	Site Reconnaissance	This PCA is located on-Site. Given that the transformers were located in concrete vaults that reportedly had deficient maintenance, access to the transformer vault was unavailable, the state of the original transformers at removal is unknown, and the age of the original transformers (1970's), it is considered to contribute to an APEC on-Site.
	#18. Electricity Generation, Transformation and Power Stations – One pad-mounted transformer was located in the parking lot on the southwest portion of the Site north of Wendy's.	Site Reconnaissance	This PCA is located on-Site and therefore must be considered to contribute to an APEC.
	#28. Gasoline and Associated Products in Fixed Tanks – The shopping centre is serviced by one hydraulic lift elevator, with associated hydraulic oil tank, located in the middle of the mall.	Site Reconnaissance, Site Representative	This PCA is located on-Site and therefore must be considered to contribute to an APEC.

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
	#37. Operation of Dry Cleaning Equipment (where chemicals are used) – Review of HLUI and Street directories indicates the presence a dry cleaner on-Site. The cleaners currently on-Site are only a drop-off depot.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder), Street Directories, HLUI	While the Site representative and previous reports indicate that the on-Site cleaners have always been a depot, it is considered unlikely that this is the case based on the years of the activity (as early as 1976). The exact location of the 1976 cleaners is unknown. As such, this PCA is considered to contribute to an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops – The former Walmart had vehicle servicing bay in the northeast corner of the store operated as a garage for decades. A bulk storage AST in the service bay was identified, as well as an underground oil water separator.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder), HLUI, Ecolog ERIS Report	Due to the presence of ASTs on the Site, as well as the service bay's long operating life as a garage (>30 years in operation), and the PCA's location on-Site, it is considered to contribute to an APEC on-Site.
Site	***#28. Gasoline and Associated Products in Fixed Tanks –*** A waste oil AST was identified in an enclosure outside the former Walmart auto service bays.	Site Reconnaissance, Site Representative, Previous Environmental Reports (Golder)	Given this PCA's location on-Site, as well as the staining noted to the east of the tank, this PCA is considered to contribute to an on-Site APEC.
	#30. Importation of Fill Material of Unknown Quality – The Site was graded with fill of unknown origin during the construction of the shopping centre in 1972.	Site Reconnaissance, Previous Environmental Reports (Golder)	Given this PCA's location across the Site, this PCA is considered to contribute to an APEC on-Site.
Phase One Study Area (excluding the Site)	***#28. Gasoline and Associated Products in Fixed Tanks –*** 1386 Richmond Road. A former gasoline service and automotive repair station (15 m northwest of the Site) is known to have had USTs while in operation as a gas station. There was also automotive repair works conducted at this property.	Ecolog ERIS Report, Previous Environmental Reports (Golder)	This PCA is located off-Site. But given its close proximity to the Site (<15 m) and the former presence of gasoline USTs, the PCA is considered to represent an APEC on Site.

Location	Potentially Contaminating Activity	Information Source	Rationale for Potential Contribution of the PCA to an APEC
	#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops 2599 Carling Avenue. A former gasoline service station and automotive repair station (100 m west of the Site) is known to have had USTs while in operation as a gas station. There is also automotive repair works and automotive wholesale conducted at this property.	EcoLog ERIS Report, Site Reconnaissance, Aerial Images, City Directories, HLUI	The PCA is separated from the Site by 100 m including Croydon Avenue and its underlying utilities. It is also hydraulically cross-gradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks - The former Sunoco Service Station (150 m west of the Site) is known to have had USTs while in operation as a gas station.	EcoLog ERIS Report	The PCA is separated from the Site by 150 m including Croydon and Forest Street and their underlying utilities. It is also hydraulically cross-gradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks and #10 Commercial Autobody Shops – 1325 Richmond Road. Former gas station with a UST, automotive wholesalers and automotive repair shops, namely Shell and currently Approval Genie, have been/are present north of the Site (approximately 50 m north of the Site.)	City Directories, EcoLog ERIS Report, HLUI	This PCA is separated from the Site by 50 m including Richmond Road and its underlying services. It is also hydraulically downgradient from the Site. As such, it is not considered to be a PCA that will result in an APEC on the Site.
	#28. Gasoline and Associated Products in Fixed Tanks and #10 Commercial Autobody Shops – 1377 Richmond Road. Current and historical automotive wholesaler and repair shop. Records indicate a waste oil UST was removed from the property. Approximately 50 m north of the Site.	Ecolog ERIS Report, City Directories, HLUI	Based on its close proximity adjacent to the Site, and its hydraulically upgradient location with respect to the Site, this PCA this is considered to represent an APEC.
	#10 Commercial Autobody Shops – 365 Forest Street. A former and current automotive repair shop; approximately 100 m west of the Site.	City Directories, Ecolog ERIS Report.	This PCA is separated from the Site by 100 m including Croydon Avenue and its underlying services. As such, it is not considered to be a PCA that will result in an APEC on the Site.

5.10.2.2 Areas of Potential Environmental Concern

The following eight APECs were identified on the Site. The location of the eight APECs is shown on Figure 1.

Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 1 - Potential for soil and groundwater impacts due to the presence of a transformer vault on the Site.	A transformer vault is located in the northeast corner of the shopping centre.	On-Site	PHCs/BTEX, PCBs	Soil and Groundwater
APEC 2 - Potential for soil and groundwater impacts due to the presence of a pad-mounted transformer on the Site.	Pad-mounted transformer located on the southwestern parking lot, north of the Wendy's on the Site.	On-Site	PHCs/BTEX, PCBs	Soil and Groundwater
APEC 3 - Potential for soil and groundwater impacts due to the presence of a hydraulic oil AST associated with the hydraulic elevator.	Hydraulic oil AST located in the center of the shopping centre.	On-Site	PHCs/BTEX	Soil and Groundwater
APEC 4 - Potential for soil and groundwater impacts due to suspected former dry cleaning activities within the Phase One Property.	Suspected former dry cleaning facility on the Phase One Property. There is a current dry cleaning drop off depot on-Site.	On-Site	VOCs	Soil and Groundwater
APEC 5 - Potential for soil and groundwater impacts due to the presence of a bulk storage AST, former oil water separator, and former auto servicing activities.	Former Walmart auto service bays in the northeast corner of the shopping centre. AST along east side of the service bays, oil water separator under west side of the service bays.	On-Site	PHCs/BTEX	Soil and Groundwater

Area of Potential Environmental Concern	Potentially Contaminating Activity	Location of PCA (on-Site or off-Site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or Sediment)
APEC 6 - Potential for soil and groundwater impacts due to the presence of a waste oil AST with visible staining.	Waste oil AST located on the sidewalk outside the former Walmart service bays in the northeast of the Site.	On-Site	PHCs/BTEX	Soil and Groundwater
APEC 7 - Potential for soil and groundwater impacts due to the presence of fill of unknown quality beneath the Site.	Fill underlies the asphalt and buildings across the Site.	On-Site	PHCs/BTEX, Metals	Soil
APEC 8 - Potential for soil and groundwater impacts due to the former presence a retail fuel outlet and garage/	A retail fuel outlet with associated fuel USTs and a garage were formerly located within the Phase One Study Area; approximately 15 m northwest of the Site.	Off-Site	PHCs/BTEX	Soil and Groundwater

5.10.3 Subsurface Structures and Utilities and Potential Migration of COCs

The Site and surrounding area are serviced with storm sewers, sanitary sewers, municipal water, natural gas and telecommunication. The main utility lines are located off-Site in Croydon Avenue and Richmond Road and the main shopping centre connects to the utilities in Richmond Road. Underground utilities on the Site may influence the groundwater flow direction and migration of COCs in groundwater. However, there were no groundwater exceedances of MOECC Table 3 Standards at the Site and no indication of contaminant migration along the underground utilities within the Site.

5.10.4 Physical Setting

5.10.4.1 Stratigraphy

Representative geologic cross-sections of the Site are presented in Figures 4 and 5.

In general, the subsurface stratigraphy at the Site consists of pavement structure comprised of gravelly sand (associated with the parking lot pavement structure) overlying silty sand fill which is generally underlain by sensitive silty clay, overlying glacial till. The silty sand and fill layers extended from depths ranging from approximately 0.1 mbgs to 6.9 mbgs. The silty clay layer ranged from 2.1 mbgs to 6.9 mbgs, and the glacial till generally ranged from the bottom of the clay to 11 to 14 mbgs.

5.10.4.2 Hydrogeological Characteristics

The fill and silty sand layers are the hydrostratigraphic units which are located at a depth between 0.5 and 6.9 mbgs. Underlying the silty sand later is a silty clay layer that limits the potential for downward migration of potential groundwater impacts at the Site. Both the silty clay and the glacial till units are not considered to be water bearing formations at the Phase Two Property.

Groundwater: Elevations and Flow Direction

A full round of water level measurements at all wells, with the exception of MW17-19, was completed on March 21, 2018. As such, an interpretation of the groundwater flow direction was created based upon the water level measurement completed on March 21, 2018. The water levels were measured more than 24 hours after monitoring well development. Details of the groundwater flow are discussed in the paragraphs below.

The screens of all eleven monitoring wells were installed between 0.91 and 6.10 mbgs with the exception of MW17-108 which was located approximately four metres higher than the other wells and was screened from 6.10 – 9.15 mbgs. All monitoring wells installed during the Phase Two ESA were used for the interpretation of the groundwater flow direction within the fill/silty sand layer based on the water level measurements on March 21, 2018. An exception was MW7-19 which could not be accessed at the time of groundwater measurement. The static groundwater levels measured on March 21, 2018 in these ten accessible monitoring wells were between 0.91 and 6.10 mbgs or at elevations 96.08 metres above bench mark (mABM) (MW17-01) and 100.55 mABM (MW17-08). Based on the water level elevations measured in the ten monitoring wells at the Site on March 21, 2018, the shallow groundwater flow direction at the Site is generally interpreted to be in a north northeast direction, consistent with previous information.

The groundwater elevations measured at the ten shallow monitoring wells and the interpreted groundwater flow directions in the fill and silty sand based on the water levels measured on March 21, 2018 are shown on Figure 2.

Monitoring for free phase product using an interface probe was conducted on March 21, 2018. No evidence of petroleum hydrocarbon free product or sheen in groundwater was observed or measured.

The measured water levels and elevations for monitoring wells are presented on Table 2 following the text of the report and are shown on the Record of Borehole sheets.

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events seasonal trends could not be identified, however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter.

Any temporary fluctuation in water levels on the Phase Two Property is not anticipated to effect the conclusions of the Phase Two ESA.

Underground Utilities

There are shallow services throughout the Site for building services and parking lot storm drainage. The main utility lines are located off-Site in Croydon Avenue and Richmond Road and the main shopping centre connects to the utilities in Richmond Road. Underground utilities on the Site may influence the groundwater flow direction and migration of COCs in groundwater. However, there were no groundwater exceedances of MOECC Table 3 Standards at the Site and no indication of contaminant migration along the underground utilities within the site.

Hydraulic Conductivity

Based on known values for silty sand (Freeze and Cherry, 1979) the measured hydraulic conductivity at the Site for the silty sand/fill is approximately $1x10^{-7}$ m/s. This hydraulic conductivity value was used to calculate the groundwater velocity in the hydrostratigraphic units.

Horizontal Hydraulic Gradients

The average horizontal hydraulic gradient was estimated for shallow groundwater conditions within the fill and silty sand based on water levels collected on March 21, 2018, and the inferred groundwater contours are presented on Figure 2. The horizontal hydraulic gradient for shallow groundwater conditions was calculated to be approximately 0.0146 m/m. Variability in hydraulic gradients calculated at the Phase Two property may be related to the presence of foundations/buried structure, bedding materials, and buried services at the Site.

Vertical Hydraulic Gradients

The vertical hydraulic gradients were not obtained as no groundwater contamination was detected,

Groundwater Velocity

The groundwater flow velocity can be calculated using the Darcy equation as follows:

$$V=ki/n_e$$

Where V =Groundwater flow velocity

k =Hydraulic conductivity

i =Horizontal hydraulic gradient

ne =Effective porosity

Based on the hydraulic conductivity of 1x10-7 m/s for silty sand, and a horizontal hydraulic gradient of approximately 0.0146 and porosities of 25% (max) to 49% (min) (for silty sand), the minimum and the maximum groundwater velocity within the silty clay is estimated to be approximately 1.84x10-1 m/year and 9.40x10-2 m/year, respectively. Note that actual groundwater velocity may vary significantly not only because of variability of the hydraulic gradient, but also because of variability of the hydraulic conductivity within the silty clay.

Based on the hydraulic conductivity of 1x10-7 m/s for glacial till, horizontal hydraulic gradients of 0.0011 (min) and 0.0035 (max) and a porosity of 40% (for glacial till), the minimum and the maximum groundwater velocity within the glacial till is estimated to be approximately 8.57x10-3 m/year and 2.76x10-2 m/year, respectively. Note that actual groundwater velocity may vary significantly not only because of variability of the hydraulic gradient, but also because of variability of the hydraulic conductivity within the glacial till.

5.10.5 Shallow Soil Property or Water Body (as per section 43.1 of O.Reg. 153/04)

Based on the information obtained from the Phase Two ESA, the sandstone bedrock was encountered at depths ranging from 9.7 to 13.7 mbgs. According to O.Reg.153/04, as amended, “shallow soil property” refers to a property for which 1/3 or more of the area consists of soil equal to or less than 2 metres in depth beneath the soil surface, excluding any non-soil surface treatment such as asphalt, concrete or aggregate. As such, based on the depth to bedrock encountered at the Site, the Site is not considered a shallow soil property.

5.10.6 Potable Water Wells

No potable water wells are located on the Site or within 250 m of the Site, based on the results of the Phase One ESA. As such, the Site is not considered to be a potable water site.

5.10.7 Environmentally Sensitive Areas (as per section 41 of O.Reg. 153/04)

The Site is developed with a commercial plaza and there is no habitat for potential species of risk at the Site. In addition, based on the information provided in the Ministry of Natural Resource and Forestry on-line database, no areas of natural significance are present on the Site or within 30 m of the Site. In addition, based on the data obtained from the upper fill material, soil pH ranged from 7.73 to 8.27, which is within MOECC's acceptable pH range of 5 to 9. As such, the Site is not considered to be environmentally sensitive.

5.10.8 Applicable Site Condition Standard

The analytical results of the samples collected for this Phase Two ESA were compared to the Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (Residential/Parkland/Institutional (R/P/I) Property Use, coarse textured soil) ("MOECC Table 3 R/I/P") and (Industrial/Commercial/Community (I/C/C) Property Use, coarse textured soil) ("MOECC Table 3 I/C/C") for soil; and Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (All Types of Property Use) ("MOECC Table 3") presented in the Ministry of Environment and Climate Change (MOECC) "*Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011. The applicable site condition standards were selected based on the following rationale:

- The Site and all other properties located, in whole or in part, within 250 metres of the Site are supplied by the City of Ottawa municipal drinking water system and there are no water supply wells which are in use;
- The Site is not located in an area designated in a municipal official plan as a well-head protection area or other designation identified by the municipality for the protection of ground water;
- Grain size analysis was performed, and the Site was found to have a coarse soil texture.
- There are no water bodies on the Site. The closest water body is the Ottawa River located approximately 850 m north of the Site;
- There are no features on the Phase Two Property that would meet the conditions of an environmentally sensitive site, as described in Section 41 of O.Reg.153/04 as amended. Based on the data obtained from the upper fill material, soil pH ranged from 7.73 to 8.27, which is within MOECC's acceptable pH range of 5 to 9.
- The intended land use for the Phase Two Property is mixed residential and commercial, as such the more sensitive land use (residential) is considered to be applicable for the Site; and,
- The overburden thickness is greater than 2 metres over more than one-third of the Phase Two Property.

5.10.9 Findings of the Phase Two ESA (Golder, 2016) with respect to APECs

To address the APECs identified at the Site, soil and groundwater sampling and analysis of potential COCs was completed as part of this Phase Two ESA. MOECC Table 3 Standards for Residential/Parkland/Institutional Property Use (April 15, 2011) were used for comparison of the soil and groundwater results. A summary of the findings of the Phase Two ESA with respect to the APECs identified by the Phase One ESA (Golder, 2017) is provided in the table below:

APEC (location shown on Figure 1)	PCA resulting in APEC (location shown on Figure 1)	Boreholes/Monitoring to Address APEC (locations are shown on Figure 1)	COC Laboratory Analysis	Soil and/or Groundwater Exceedances of 2011 MOE Table 3 R/P/I Standards
APEC 1 - Potential for soil and groundwater impacts due to the presence of a transformer vault on the Site.	***#18. Electricity Generation, Transformation and Power Stations –*** The transformer vault for Lincoln Fields Shopping Centre in the northeast corner of the building.	Completion of BH17-23 within APEC 1 and the sampling of groundwater in MW02-06.	Soil: PHCs F1 to F4, PCBs, VOCs Groundwater: PHCs F1 to F4, PCBs, VOCs	None
APEC 2 - Potential for soil and groundwater impacts due to the presence of a pad-mounted transformer on the Site.	***#18. Electricity Generation, Transformation and Power Stations –*** One pad-mounted transformer was located in the parking lot on the southwest portion of the Site north of Wendy's.	Completion of BH17-08 installed with a monitoring well within APEC 2.	Soil: PHCs F1 to F4, PCBs, VOCs Groundwater: PHCs F1 to F4, PCBs, VOCs	None
APEC 3 - Potential for soil and groundwater impacts due to the presence of a hydraulic oil AST associated with the hydraulic elevator.	***#28. Gasoline and Associated Products in Fixed Tanks –*** The shopping centre is serviced by one hydraulic lift elevator, with associated hydraulic oil tank, located in the middle of the mall.	Completion of BH17-6 installed with a monitoring well within APEC 3.	Soil: PHCs F1 to F4, VOCs Groundwater: PHCs F1 to F4, VOCs	None
APEC 4 - Potential for soil and groundwater impacts due to suspected former dry cleaning activities within the Phase One Property.	***#37. Operation of Dry Cleaning Equipment (where chemicals are used) –*** Review of HLUI and Street directories indicated the presence a dry cleaner on-Site. The cleaners currently on-Site are only a drop-off depot.	Completion BH17-109 installed with a monitoring well near the current dry cleaning depot. The testing for VOCs in all groundwater and soil samples taken from the Site.	Soil: VOCs, PHCs F1 to F4 Groundwater: VOCs, PHCs F1 to F4	None

APEC (location shown on Figure 1)	PCA resulting in APEC (location shown on Figure 1)	Boreholes/Monitoring to Address APEC (locations are shown on Figure 1)	COC Laboratory Analysis	Soil and/or Groundwater Exceedances of 2011 MOE Table 3 R/P/I Standards
APEC 5 - Potential for soil and groundwater impacts due to the presence of a bulk storage AST, former oil water separator, and former auto servicing activities.	***#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops –*** The former Walmart had vehicle servicing bay in the northeast corner of the store operated as a garage for decades. A bulk storage AST in the service bay was identified, as well as an underground oil water separator.	Completion of four boreholes (BH17-6, BH17-23, BH17-24, and BH17-25) within APEC 5. The installation of monitoring wells in BH17-6, and BH17-25 within APEC 5. Groundwater sampling from MW17-6, MW17-25, MW02-05, and MW02-06.	Soil: PHCs F1 to F4, VOCs Groundwater: PHCs F1 to F4, VOCs	None
APEC 6 - Potential for soil and groundwater impacts due to the presence of a waste oil AST with visible staining.	***#28. Gasoline and Associated Products in Fixed Tanks –*** A waste oil AST was identified in an enclosure outside the former Walmart auto service bays.	Completion of BH17-19 installed with a monitoring well within APEC 6.	Soil: PHCs F1 to F4, VOCs Groundwater: PHCs F1 to F4, VOCs	None
APEC 7 - Potential for soil and groundwater impacts due to the presence of fill of unknown quality beneath the Site.	***#30. Importation of Fill Material of Unknown Quality –*** The Site was graded with fill of unknown origin during the construction of the shopping centre in 1972.	Completion of BH17-111 and BH17-109, as well as additional sampling from BH17-20 and BH17-19.	Soil: PHCs F1 to F4, VOCs, metals, PAHs, pH.	None
APEC 8 - Potential for soil and groundwater impacts due to the former presence a retail fuel outlet and garage/	***#28. Gasoline and Associated Products in Fixed Tanks –*** Records indicate that off-Site adjacent to the northwest of the Site, was a former gasoline service station with USTs.	Completion of three boreholes (BH17-1, BH17-20, and BH17-21) installed with monitoring wells within APEC 8.	Soil: PHCs F1 to F4, VOCs Groundwater: PHCs F1 to F4, VOCs	None

As summarized in the above table, the results of this Phase Two ESA indicate that no soil or groundwater impacts associated with the eight APECs were identified in any of the analyzed soil and groundwater samples collected from the boreholes and the monitoring wells completed within the eight APECs at the Site. The concentrations of the COCs (PHCs F1 to F4, VOCs, PAHs and PCBs) in soil and groundwater associated with the eight APECs were all below the MOECC Table 3 R/P/I Standards.

5.10.10 Meteorological and Climatic Considerations

Seasonal fluctuation in water levels on the Site should be expected. Given the limited number of monitoring events seasonal trends could not be identified, however shallow groundwater water levels are typically highest following the spring recharge and decline throughout the summer and fall months into the winter. The entire site is paved and serviced by storm sewer catchments connected to the City storm sewer. As such, not much local recharge is anticipated. In addition, given that the concentrations of the COCs in soil and groundwater were below the applicable MOECC Table 3 Standards and no impacts in soil or groundwater were identified, the temporal fluctuations in the groundwater levels due to variable effects of climatic or meteorological conditions would not influence the distribution and migration of contaminants on the Site.

5.10.11 Soil Vapour Intrusion Pathways

No volatile compounds exceeding MOECC Table 3 Standards were identified in soil or groundwater at the Site. As such, vapour intrusion was not investigated as part of this Phase Two ESA as it is not considered to be a concern for the Site.

5.10.12 Cross-Sections

Lateral and Vertical Distribution of Contaminants

No COCs were identified in soil or groundwater at the Site.

Representative cross-sections of the Site are presented in Figures 4 and 5.

5.10.13 Potential Exposure Pathways and Receptors

Given that the concentrations of the COCs in soil and groundwater were below the applicable MOECC Table 3 Standards and no impacts in soil or groundwater were identified there is no potential for contaminant release and migration at the Site.

As such, no description of the potential contaminant release and transport mechanisms, exposure pathways and human and ecological receptors located on-Site in relation to COCs is provided as part of the report.

5.10.14 Summary of Current On-Site Conditions

Based on findings of the Phase Two ESA, no exceedances of the applicable MOE Table 3 Standards were identified in soil and groundwater for the contaminants of concern associated with the eight APECs on the Site (PHC F1 to F4, VOCs (including BTEX), PCBs, metals, and PAHs.

Vapour intrusion was not investigated as part of this Phase Two ESA as it is not of concern for the Site (no VOCs impacts were identified on the Site).

6.0 CONCLUSIONS

The Phase Two ESA was carried out at the Site in accordance with O.Reg. 153/04 to address the following eight APECs identified in the 2018 Golder Phase One ESA recently completed for the Site:

- APEC 1 - Potential for soil and groundwater impacts due to the presence of a transformer vault on the Site. #18. Electricity Generation, Transformation and Power Stations – The transformer vault for Lincoln Fields Shopping Centre in the northeast corner of the building.
- APEC 2 - Potential for soil and groundwater impacts due to the presence of a pad-mounted transformer on the Site.#18. Electricity Generation, Transformation and Power Stations – One pad-mounted transformer was located in the parking lot on the southwest portion of the Site north of Wendy's.
- APEC 3 - Potential for soil and groundwater impacts due to the presence of a hydraulic oil AST associated with the hydraulic elevator.#28. Gasoline and Associated Products in Fixed Tanks – The shopping centre is serviced by one hydraulic lift elevator, with associated hydraulic oil tank, located in the middle of the mall.
- APEC 4 - Potential for soil and groundwater impacts due to suspected former dry cleaning activities within the Phase One Property.#37. Operation of Dry Cleaning Equipment (where chemicals are used) – Review of HLUI and Street directories indicated the presence a dry cleaner on-Site. The cleaners currently on-Site are only a drop-off depot.
- APEC 5 - Potential for soil and groundwater impacts due to the presence of a bulk storage AST, former oil water separator, and former auto servicing activities.#28. Gasoline and Associated Products in Fixed Tanks, #10 Commercial Autobody Shops – The former Walmart had vehicle servicing bay in the northeast corner of the store operated as a garage for decades. A bulk storage AST in the service bay was identified, as well as an underground oil water separator.
- APEC 6 - Potential for soil and groundwater impacts due to the presence of a waste oil AST with visible staining.#28. Gasoline and Associated Products in Fixed Tanks – A waste oil AST was identified in an enclosure outside the former Walmart auto service bays.
- APEC 7 - Potential for soil and groundwater impacts due to the presence of fill of unknown quality beneath the Site.#30. Importation of Fill Material of Unknown Quality – The Site was graded with fill of unknown origin during the construction of the shopping centre in 1972.
- APEC 8 - Potential for soil and groundwater impacts due to the former presence a retail fuel outlet and garage/#28. Gasoline and Associated Products in Fixed Tanks – Records indicate that off-Site adjacent to the northwest of the Site, was a former gasoline service station with USTs.

All eight APECs were investigated during the Phase Two ESA. Based on the completed scope of work and results of the Phase Two ESA, the following conclusions are provided:

- Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition (Residential/Parkland/Institutional Property Use, coarse textured soil, April 15, 2011) are considered applicable and were used to assess the environmental quality of soil and groundwater at the Site.
- Soil sampling completed at the Site indicates that none of the soil samples submitted for laboratory analysis of the COCs related to the eight APECs: PHC F1 to F4, VOCs, PAHs, metals, and/or PCBs exceeded the MOECC Table 3 Standards indicating that none of the eight APECs impacted the soil on the Site.

- Groundwater sampling completed at the Site indicates that none of the groundwater samples submitted for laboratory analyses of PHC F1 to F4, VOCs, and/or PCBs exceeded the MOE Table 3 Standards for the parameters analyzed. No odour, sheen or free product was observed or detected in any of the ten wells during the investigation. Therefore, groundwater at the Site meets the site applicable standards at the time of the investigation.
- Based on the results of the soil and groundwater duplicate samples, trip spike, trip and field blanks and the implemented quality assurance and quality control measures during the Phase Two ESA, it is considered that the data obtained during the Phase Two ESA is reliable, reproducible and representative of the Site conditions.
- Based on the results obtained during the Phase Two ESA, soil or groundwater impacts associated with the eight APECs on the Site were not identified and the soil and groundwater quality at the Site meets the applicable standards at the time of the investigation.
- The monitoring wells installed on the Site as part of the Phase Two ESA should be decommissioned in accordance with Ontario Regulation 903 if no longer required.

7.0 REFERENCES

MOECC. 2004. *Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act,* March 9, 2004 (amended in July 2009 and effective as of July 1, 2011).

MOECC. 2011. *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act*, dated April 15, 2011

MOECC. 2011. Ontario Regulation 153/04, as amended, *Record of Site Condition - Part XV.1 of the Environmental Protection Act*, amended October 31, 2011

MOECC, 2013. Report Template for Phase Two Environmental Site Assessment Conducted in Accordance with Ontario Regulation 153/04, as amended, prepared by Association of Professional Geoscientists of Ontario, dated October, 2013.

MOECC, 2011. Guide for Completing Phase Two Environmental Site Assessments under Ontario Regulation 153/04, dated June, 2011.

R. Allan Freeze and John A. Cherry, *Groundwater*, dated 1979

Golder Associates (Golder), *Phase I Environmental Site Assessment Lincoln Fields Shopping Centre 2525 Carling Avenue Ottawa, Ontario,* dated March 2002.

Golder Associates (Golder), *Phase II Environmental Site Assessment Lincoln Fields Shopping Centre 2525 Carling Avenue Ottawa, Ontario,* dated April 2002.

Golder, 2018 Phase One ESA Report No. 1783221 entitled, "*Phase One Environmental Site Assessment, Lincoln Fields, Ottawa, Ontario*", dated February 2018

8.0 LIMITATIONS

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

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

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

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

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

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

Signature Page

We trust that this report meets your current needs. If you have any questions, or if we may be of further assistance, please contact the undersigned.

Golder Associates Ltd.

Alex Wood, EIT
Environmental Consultant

Berend Jan Velderman, PGeo, QPESA, RA
Principal

AW/BJV/ca/hw

https://golderassociates.sharepoint.com/sites/13747g/deliverables/enviro folder/full site - phase two esa/final/1783221 - riocan lincoln fields phase two esa_15may2018.docx

Tables

Table 1
Monitoring Well Construction and Groundwater Elevation Details

Monitoring Well ID	Location (UTM 18)		Installation Date	End of Borehole (mbgs)	Screen (mbgs)	Ground Surface Elevation (in relation to benchmark)	Water Level Depth (mbgs)	Water Level Elevation (in relation to benchmark)
	Easting	Northing						
MW17-01	438303.82	5023779.31	21/02/2018	10.82	2.89 - 5.94	102.18	5.97	96.08
MW17-06	438451 (1)	5023823 (1)	14/07/2017	6.86	1.52 - 4.57	100.04	1.58	98.41
MW17-08	438359.92	5023668.76	28/11/2017	7.02	3.05 - 6.10	102.75	2.11	100.55
MW17-19	438464.00	5023861.00	21/07/2017	6.10	1.52 - 4.57	NA	NA	NA
MW17-20	438321.12	5023785.80	20/02/2018	5.94	2.89 - 5.94	101.66	2.17	99.42
MW17-21	438318.24	5023811.38	22/02/2018	5.94	2.89 - 5.94	100.77	1.96	98.66
MW17-25	438465 (1)	5023846 (1)	18/07/2017	6.10	1.52 - 4.57	100.05	2.07	97.89
MW17-101	438330.01	5023733.50	24/11/2017	6.70	3.20 - 6.25	102.71	2.54	100.07
MW17-108	438424.05	5023739.24	29/11/2017	9.15	6.10 - 9.15	105.9	6.01	99.81
MW02-05	438469 (1)	5023857 (1)	03/2002	3.96	0.91 - 3.96	100.05	2.21	97.79
MW02-06	438478 (1)	5023860 (1)	03/2002	4.42	0.95 - 4.00	100.05	2.35	97.65

Table 2
Summary of Soil Samples Submitted for Laboratory Analysis

Borehole ID	Soil Samples Submitted for Analysis	Sample Depths (mbgs)	PID (ppm) IBL or IBL/HEX	Sample Collection Date	Analytical Paramaters	MOECC Table 3 Exceedances (1)
BH17-01	17-01 SA3	2.29 - 2.90	0.7	21/02/18	PHCs and VOCs	None
	17-01 SA4	3.05 - 3.66	0.9	21/02/18	PHCs and VOCs	None
BH17-06	17-6 (SA-4)	1.83 - 2.44	0/15	19/07/17	PHCs and VOCs	None
	17-6 (SA-7)	3.66 - 4.27	0/0	19/07/17	PHCs and VOCs	None
BH17-08	17-08 SA1	2.29 - 2.90	0.6	28/11/17	153 Metals, PHCs + BTEX, PAHs and PCBs	None
	17-08 SA4	4.57 - 5.18	0.4	28/11/17	PHCs + BTEX, pH and PCBs	None
BH17-19	17-19 (SA1)	0.15 - 0.45	0/0	21/07/17	Metals and Inorganics, PHCs, and VOCs	None
	17-19 (SA4)	2.29 - 2.90	2/0	21/07/17	PHCs and VOCs	None
BH17-20	17-20 SA2	1.52 - 2.51	0.6	20/02/18	Metals and Inorganics, PHCs, VOCs, and PAHs	None
	17-20 SA2 DUP	1.52 - 2.51	0.6	20/02/18	Metals and Inorganics, PHCs, VOCs, and PAHs	None
	17-20 SA5	3.81 - 4.42	0.9	20/02/18	PHCs and VOCs	None
BH17-21	17-21 SA1	0.76 - 1.37	0.3	22/02/18	PHCs and VOCs	None
	17-21 SA2	1.52 - 2.13	0.4	22/02/18	PHCs and VOCs	None
	17-21 SA3	2.29 - 2.90	0.4	22/02/18	PHCs and VOCs	None
	17-21 SA5	3.31 - 4.42	0.3	22/02/18	PHCs and VOCs	None
BH17-23	17-23 (SA-2)	0.61 - 1.22	0/0	17/07/17	PHCs, VOCs, and PCBs	None
	17-23 (SA-4)	1.83 - 2.44	0/0	17/07/17	PHCs, VOCs, and PCBs	None
	17-23 (SA-14)					None
BH17-24	17-24 (SA-1)	0.15 - 0.61	0/10	17/07/17	PHCs and VOCs	None
	17-24 (SA-5)	2.44 - 3.05	0/0	17/07/17	PHCs and VOCs	None
BH17-25	17-25 (SA-3)	1.37 - 1.98	2/0	18/07/17	PHCs and VOCs	None
	17-25 (SA-6)	3.05 - 3.66	2/10	18/07/17	PHCs and VOCs	None
BH17-101	17-101 SA1	0.76 - 1.32	1.2	28/11/17	153 Metals, PHCs + BTEX, and PAHs	None
	17-101 SA4	3.05 - 3.66	1	28/11/17	PHCs + BTEX	None
	17-101 SA44					None
BH17-108	17-108 SA3	2.24 - 2.90	0.6	29/11/17	153 Metals, PHCs + BTEX, and PAHs	None
	17-108 SA7	5.34 - 5.95	10.2	29/11/17	153 Metals, VOCs, PHCs, and PAHs	None
BH17-109	17-109 SA4	3.81 - 4.42	5	13/02/18	Metals and Inorganics, PHCs, and PAHs	None
BH17-111	17-111 SA3	0.76 - 1.37	0.5	20/02/18	Metals and Inorganics, PHCs, and PAHs	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, coarse-textured soil, April 15, 2011 (MOECC Table 3 Standards).
None = Not detected above method detection limit and/ or does not exceed MOE Table 3 Standards
N/A - Not applicable

Table 3
Summary of Groundwater Samples Submitted for Laboratory Analysis

Monitoring Well ID	Groundwater Samples Submitted for Analysis	Date Sampled	Observations	Analytical Paramaters	MOECC Table 3 Exceedances (1)
MW17-01	17-01	21/03/2018	Turbid, grey, some sediment, no odour, no sheen	PHCs and VOCs	None
MW17-06	17-06	28/02/2018	Clear, slight grey/brown colour, odourless	PHCs and VOCs	None
MW17-08	17-08	11/12/2017	Clear, colourless, no sediment, no odour, no sheen	PHCs, PCBs, and VOCs	None
Duplicate (MW17-08)	DUP1	11/12/2017		PHCs, PCBs, and VOCs	None
MW17-19	17-19	28/02/2018	Clear and odourless	PHCs and VOCs	None
MW17-20	Not Sampled (Inaccessible)				
MW17-21	17-21	27/02/2018	Clear, odourless, transparent	PHCs and VOCs	None
		21-03-2018	Clear, colourless, no sediment, no odour, no sheen	PHCs and VOCs	None
MW17-25	17-25	28/02/2018	None	PHCs and VOCs	None
MW17-101	17-101	11/12/2017	Clear, colourless, no sediment, no odour, no sheen	PHCs and VOCs	None
MW17-108	17-108	11/12/2017	Clear, colourless, no sediment, no odour, no sheen	PHCs and VOCs	None
MW02-05	02-5	28/02/2018	Clear, transparent to translucent, slight odour.	PHCs and VOCs	None
MW02-06	02-6	28/02/2018 (PCHs, & VOCs) 07/03/2018 (PCBs)	Slightly turbid, grey, no odour, no sed, no sheen.	PHCs, PCBs, and VOCs	None
Duplicate (MW02-06)	DUP026	28/02/2018 (PCHs, & VOCs) 07/03/2018 (PCBs)	None	PHCs, PCBs, and VOCs	None
Trip Blank 1	Trip Blank	11/12/2017	NA	PHCs and VOCs	None
Trip Blank 2	Trip Blank	28/02/2018	NA	PHCs and VOCs	None
Trip Blank 2	Trip Blank	21/03/2018	NA	PHCs and VOCs	None

(1) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3 Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, All Property Use, coarse-textured soil, April 15, 2011 (MOECC Table 3 Standards).
None = Not detected above method detection limit and/ or does not exceed MOE Table 3 Standards
N/A - Not applicable

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-1	17-1	17-101	17-101	17-101	17-108	17-108	17-109	17-111	17-19
				21-Feb-2018	21-Feb-2018	28-Nov-2017	28-Nov-2017	28-Nov-2017	29-Nov-2017	29-Nov-2017	13-Feb-2018	20-Feb-2018	21-Jul-2017
				17-01 SA3	17-01 SA4	17-101 SA1	17-101 SA4	17-101 SA44 (Field Duplicate)	17-108 SA3	17-108 SA7	17-109 SA4	17-111 SA3	17-19 (SA1)
Sample Depth	m			2.29 - 2.9	3.05 - 3.66	0.76 - 1.32	3.05 - 3.66	3.05 - 3.66	2.24 - 2.9	5.34 - 5.95	3.81 - 4.42	0.76 - 1.37	0.15 - 0.45
General Chemistry													
Conductivity	ms/cm	0.7	1.4	--	--	--	--	--	--	--	--	--	0.508
Cyanide (free)	ug/g	0.051	0.051	--	--	--	--	--	--	--	--	--	<0.040
Moisture, Percent	%	--	--	10.8	10.0	5.4 5.4	26.5	27.8	15.3 15.3	11.2 11.2	5.0	10.3	2.8
pH	-	--	--	--	--	--	--	--	--	--	7.95	8.27	8.15
PCBs													
Aroclor 1242	ug/g	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1248	ug/g	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1254	ug/g	--	--	--	--	--	--	--	--	--	--	--	--
Aroclor 1260	ug/g	--	--	--	--	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls	ug/g	0.35	1.1	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-19 21-Jul-2017 17-19 (SA4)	17-20 20-Feb-2018 17-20 SA2	17-20 20-Feb-2018 DUP (Field Duplicate)	17-20 20-Feb-2018 17-20 SA5	17-21 22-Feb-2018 17-21 SA1	17-21 22-Feb-2018 17-21 SA3	17-21 22-Feb-2018 17-21 SA2	17-21 22-Feb-2018 17-21 SA5	17-23 17-Jul-2017 17-23 (SA-2)	17-23 17-Jul-2017 17-23 (SA-4)
Sample Depth	m			2.29 - 2.9	1.52 - 2.51	1.52 - 2.51	3.81 - 4.42	0.76 - 1.37	2.29 - 2.9	1.52 - 2.13	3.31 - 4.42	0.61 - 1.22	1.83 - 2.44
General Chemistry													
Conductivity	ms/cm	0.7	1.4	--	--	--	--	--	--	--	--	--	--
Cyanide (free)	ug/g	0.051	0.051	--	--	--	--	--	--	--	--	--	--
Moisture, Percent	%	--	--	19.8	11.4	11.0	6.9	17.9	11.3	6.4	9.3	25.3 25.3	20.2 20.2
pH	-	--	--	--	7.84	7.79	--	7.61	--	--	--	--	--
PCBs													
Aroclor 1242	ug/g	--	--	--	--	--	--	--	--	--	--	<0.1	<0.1
Aroclor 1248	ug/g	--	--	--	--	--	--	--	--	--	--	<0.1	<0.1
Aroclor 1254	ug/g	--	--	--	--	--	--	--	--	--	--	<0.1	<0.1
Aroclor 1260	ug/g	--	--	--	--	--	--	--	--	--	--	<0.1	<0.1
Polychlorinated Biphenyls	ug/g	0.35	1.1	--	--	--	--	--	--	--	--	<0.1	<0.1

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-23 17-Jul-2017 17-23 (SA-14) (Field Duplicate)	17-24 17-Jul-2017 17-24 (SA-1)	17-24 17-Jul-2017 17-24 (SA-5)	17-25 18-Jul-2017 17-25 (SA-3)	17-25 18-Jul-2017 17-25 (SA-6)	17-6 19-Jul-2017 17-6 (SA-4)	17-6 19-Jul-2017 17-6 (SA-7)	17-8 28-Nov-2017 17-08 SA1	17-8 28-Nov-2017 17-08 SA4
Sample Depth	m			1.83 - 2.44	0.15 - 0.61	2.44 - 3.05	1.37 - 1.98	3.05 - 3.66	1.83 - 2.44	3.66 - 4.27	2.29 - 2.9	4.57 - 5.18
General Chemistry												
Conductivity	ms/cm	0.7	1.4	--	--	--	--	--	--	--	--	--
Cyanide (free)	ug/g	0.051	0.051	--	--	--	--	--	--	--	--	--
Moisture, Percent	%	--	--	18.4 18.4	22.9 22.9	31.9 31.9	26.2 26.2	30.9 30.9	17.1 17.1	13.0 13.0	15.2 15.2	31.4
pH	-	--	--	--	--	--	--	--	--	--	--	7.73
PCBs												
Aroclor 1242	ug/g	--	--	<0.1	--	--	--	--	--	--	--	--
Aroclor 1248	ug/g	--	--	<0.1	--	--	--	--	--	--	--	--
Aroclor 1254	ug/g	--	--	<0.1	--	--	--	--	--	--	--	--
Aroclor 1260	ug/g	--	--	<0.1	--	--	--	--	--	--	--	--
Polychlorinated Biphenyls	ug/g	0.35	1.1	<0.1	<0.1	<0.1	--	--	--	--	<0.1	<0.1

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-101 28-Nov-2017 17-101 SA1	17-108 29-Nov-2017 17-108 SA3	17-108 29-Nov-2017 17-108 SA7	17-109 13-Feb-2018 17-109 SA4	17-111 20-Feb-2018 17-111 SA3	17-19 21-Jul-2017 17-19 (SA1)	17-20 20-Feb-2018 17-20 SA2	17-20 20-Feb-2018 DUP (Field Duplicate)	17-8 28-Nov-2017 17-08 SA1
Sample Depth	m			0.76 - 1.32	2.24 - 2.9	5.34 - 5.95	3.81 - 4.42	0.76 - 1.37	0.15 - 0.45	1.52 - 2.51	1.52 - 2.51	2.29 - 2.9
Metals												
Antimony	ug/g	7.5	40	--	--	--	<0.8	<0.8	<0.8	<0.8	<0.8	--
Arsenic	ug/g	18	18	--	--	--	1	1	3	2.00	2.00	--
Barium	ug/g	390	670	29	58	76	29	290	169	93.00	74.00	32
Beryllium	ug/g	4	8	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
Boron	ug/g	120	120	<5	<5	<5	<5	<5	13	6.00	7.00	<5
Boron, Hot Water Soluble	ug/g	1.5 [3]	2 [3]	--	--	--	--	--	1.07	--	--	--
Cadmium	ug/g	1.2	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	ug/g	160	160	8	23	17	7	55	10	13.00	13.00	9
Cobalt	ug/g	22	80	2.8	7.4	5.7	3.8	15.9	7.4	7.1	6.90	2.6
Copper	ug/g	140	230	6	11	13	9	33	12	13	13.00	4
Hexavalent Chromium	ug/g	8	8	--	--	--	--	--	<0.2	--	--	--
Lead	ug/g	120	120	3	4	4	3	7	12	6	6.00	5
Mercury	ug/g	0.27	3.9	--	--	--	--	--	<0.10	--	--	--
Molybdenum	ug/g	6.9	40	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	1.0	0.90	<0.5
Nickel	ug/g	100	270	5	12	13	6	34	15	13	12.00	4
Selenium	ug/g	2.4	5.5	--	--	--	<0.4	<0.4	<0.4	<0.4	<0.4	--
Silver	ug/g	20	40	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	ug/g	1	3.3	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	ug/g	23	33	<0.5	0.8	<0.5	<0.5	0.7	<0.5	<0.5	0.50	0.5
Vanadium	ug/g	86	86	13	25	24	12	55	19	16	16.00	16
Zinc	ug/g	340	340	10	23	27	12	90	16	19	17.00	16

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-1 21-Feb-2018 17-01 SA3	17-1 21-Feb-2018 17-01 SA4	17-101 28-Nov-2017 17-101 SA1	17-101 28-Nov-2017 17-101 SA4	17-101 28-Nov-2017 17-101 SA44 (Field Duplicate)	17-108 29-Nov-2017 17-108 SA3	17-108 29-Nov-2017 17-108 SA7
Sample Depth	m			2.29 - 2.9	3.05 - 3.66	0.76 - 1.32	3.05 - 3.66	3.05 - 3.66	2.24 - 2.9	5.34 - 5.95
Petroleum Hydrocarbons										
Benzene	ug/g	0.21	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	2	9.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	ug/g	--	--	<0.05	<0.05	--	--	--	--	<0.05
o-Xylene	ug/g	--	--	<0.05	<0.05	--	--	--	--	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F1 (C6-C10) -BTEX	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	98	230	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16) less Naphthalene	ug/g	--	--	--	--	<10	--	--	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	300	1700	<50	<50	<50	<50	<50	<50	<50
Petroleum Hydrocarbons - F3 (C16-C34) less PAHs	ug/g	--	--	--	--	<50	--	--	<50	<50
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	2800	3300	<50	<50	<50	<50	<50	<50	<50
Toluene	ug/g	2.3	68	<0.02	<0.02	<0.08	<0.08	<0.08	<0.08	<0.02
Xylenes, Total	ug/g	3.1	26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-109 13-Feb-2018 17-109 SA4	17-111 20-Feb-2018 17-111 SA3	17-19 21-Jul-2017 17-19 (SA1)	17-19 21-Jul-2017 17-19 (SA4)	17-20 20-Feb-2018 17-20 SA2	17-20 20-Feb-2018 DUP (Field Duplicate)	17-20 20-Feb-2018 17-20 SA5
Sample Depth	m			3.81 - 4.42	0.76 - 1.37	0.15 - 0.45	2.29 - 2.9	1.52 - 2.51	1.52 - 2.51	3.81 - 4.42
Petroleum Hydrocarbons										
Benzene	ug/g	0.21	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	2	9.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	ug/g	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/g	--	--	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F1 (C6-C10) -BTEX	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	98	230	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16) less Naphthalene	ug/g	--	--	<10	<10	--	--	<10	<10	--
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	300	1700	210	<50	150	<50	<50	<50	<50
Petroleum Hydrocarbons - F3 (C16-C34) less PAHs	ug/g	--	--	210	<50	--	--	<50	<50	--
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	2800	3300	110	<50	170	<50	<50	<50	<50
Toluene	ug/g	2.3	68	<0.08	<0.08	<0.02	<0.02	<0.02	<0.02	<0.02
Xylenes, Total	ug/g	3.1	26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-21	17-21	17-21	17-21	17-23	17-23	17-23
				22-Feb-2018	22-Feb-2018	22-Feb-2018	22-Feb-2018	17-Jul-2017	17-Jul-2017	17-Jul-2017
				17-21 SA1	17-21 SA3	17-21 SA2	17-21 SA5	17-23 (SA-2)	17-23 (SA-4)	(SA-14) (Field Dup
Sample Depth	m			0.76 - 1.37	2.29 - 2.9	1.52 - 2.13	3.31 - 4.42	0.61 - 1.22	1.83 - 2.44	1.83 - 2.44
Petroleum Hydrocarbons										
Benzene	ug/g	0.21	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	2	9.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	ug/g	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/g	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F1 (C6-C10) -BTEX	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	98	230	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16) less Naphthalene	ug/g	--	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	300	1700	<50	<50	<50	<50	<50	<50	<50
Petroleum Hydrocarbons - F3 (C16-C34) less PAHs	ug/g	--	--	--	--	--	--	--	--	--
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	2800	3300	<50	<50	<50	<50	<50	<50	<50
Toluene	ug/g	2.3	68	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Xylenes, Total	ug/g	3.1	26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-24	17-24	17-25	17-25	17-6	17-6	17-8	17-8
				17-Jul-2017	17-Jul-2017	18-Jul-2017	18-Jul-2017	19-Jul-2017	19-Jul-2017	28-Nov-2017	28-Nov-2017
				17-24 (SA-1)	17-24 (SA-5)	17-25 (SA-3)	17-25 (SA-6)	17-6 (SA-4)	17-6 (SA-7)	17-08 SA1	17-08 SA4
Sample Depth	m			0.15 - 0.61	2.44 - 3.05	1.37 - 1.98	3.05 - 3.66	1.83 - 2.44	3.66 - 4.27	2.29 - 2.9	4.57 - 5.18
Petroleum Hydrocarbons											
Benzene	ug/g	0.21	0.32	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Ethylbenzene	ug/g	2	9.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m,p-Xylenes	ug/g	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--
o-Xylene	ug/g	--	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--	--
Petroleum Hydrocarbons - F1 (C6-C10)	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F1 (C6-C10) -BTEX	ug/g	55 [4]	55 [4]	<5	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	ug/g	98	230	<10	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F2 (C10-C16) less Naphthalene	ug/g	--	--	--	--	--	--	--	--	<10	--
Petroleum Hydrocarbons - F3 (C16-C34)	ug/g	300	1700	<50	<50	<50	<50	<50	<50	<50	<50
Petroleum Hydrocarbons - F3 (C16-C34) less PAHs	ug/g	--	--	--	--	--	--	--	--	<50	--
Petroleum Hydrocarbons - F4 (C34-C50)	ug/g	2800	3300	<50	<50	<50	<50	<50	<50	<50	<50
Toluene	ug/g	2.3	68	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.08	<0.08
Xylenes, Total	ug/g	3.1	26	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-1 21-Feb-2018 17-01 SA3	17-1 21-Feb-2018 17-01 SA4	17-108 29-Nov-2017 17-108 SA7	17-19 21-Jul-2017 17-19 (SA1)	17-19 21-Jul-2017 17-19 (SA4)	17-20 20-Feb-2018 17-20 SA2	17-20 20-Feb-2018 DUP (Field Duplicate)	17-20 20-Feb-2018 17-20 SA5
Sample Depth	m			2.29 - 2.9	3.05 - 3.66	5.34 - 5.95	0.15 - 0.45	2.29 - 2.9	1.52 - 2.51	1.52 - 2.51	3.81 - 4.42
VOCs											
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.087	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1,1-Trichloroethane	ug/g	0.38	6.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1-Dichloroethane	ug/g	3.5	17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethylene	ug/g	0.05	0.064	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/g	3.4	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	ug/g	0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichloropropane	ug/g	0.05	0.16	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,3-Dichlorobenzene	ug/g	4.8	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, Total	ug/g	0.05	0.18	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,4-Dichlorobenzene	ug/g	0.083	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	ug/g	16	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	ug/g	1.7	31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acetone	ug/g	16	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	ug/g	13	18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	ug/g	0.27	0.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	ug/g	2.4	2.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	ug/g	0.05	0.47	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
cis-1,2-Dichloroethene	ug/g	3.4	55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	ug/g	9.4	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	ug/g	16	16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-Butyl Ether	ug/g	0.75	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	1.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
n-Hexane	ug/g	2.8	46	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	ug/g	0.28	4.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethene	ug/g	0.084	1.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	ug/g	0.061	0.91	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichlorofluoromethane	ug/g	4	4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.032	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-21 22-Feb-2018 17-21 SA1	17-21 22-Feb-2018 17-21 SA3	17-21 22-Feb-2018 17-21 SA2	17-21 22-Feb-2018 17-21 SA5	17-23 17-Jul-2017 17-23 (SA-2)	17-23 17-Jul-2017 17-23 (SA-4)
Sample Depth	m			0.76 - 1.37	2.29 - 2.9	1.52 - 2.13	3.31 - 4.42	0.61 - 1.22	1.83 - 2.44
VOCs									
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.087	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1,1-Trichloroethane	ug/g	0.38	6.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1-Dichloroethane	ug/g	3.5	17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethylene	ug/g	0.05	0.064	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/g	3.4	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	ug/g	0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichloropropane	ug/g	0.05	0.16	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,3-Dichlorobenzene	ug/g	4.8	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, Total	ug/g	0.05	0.18	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,4-Dichlorobenzene	ug/g	0.083	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	ug/g	16	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	ug/g	1.7	31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acetone	ug/g	16	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	ug/g	13	18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	ug/g	0.27	0.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	ug/g	2.4	2.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	ug/g	0.05	0.47	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
cis-1,2-Dichloroethene	ug/g	3.4	55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	ug/g	9.4	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	ug/g	16	16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-Butyl Ether	ug/g	0.75	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	1.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
n-Hexane	ug/g	2.8	46	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	ug/g	0.28	4.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethene	ug/g	0.084	1.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	ug/g	0.061	0.91	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichlorofluoromethane	ug/g	4	4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.032	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Parameter	Unit	REG153 (11) T3-R/P/I SOIL COARSE [1]	REG153 (11) T3-I/C/C SOIL COARSE [2]	17-23 17-Jul-2017 17-23 (SA-14) (Field Duplicate)	17-24 17-Jul-2017 17-24 (SA-1)	17-24 17-Jul-2017 17-24 (SA-5)	17-25 18-Jul-2017 17-25 (SA-3)	17-25 18-Jul-2017 17-25 (SA-6)	17-6 19-Jul-2017 17-6 (SA-4)	17-6 19-Jul-2017 17-6 (SA-7)
Sample Depth	m			1.83 - 2.44	0.15 - 0.61	2.44 - 3.05	1.37 - 1.98	3.05 - 3.66	1.83 - 2.44	3.66 - 4.27
VOCs										
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.087	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1,1-Trichloroethane	ug/g	0.38	6.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2-Trichloroethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,1-Dichloroethane	ug/g	3.5	17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,1-Dichloroethylene	ug/g	0.05	0.064	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dibromoethane	ug/g	0.05	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichlorobenzene	ug/g	3.4	6.8	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloroethane	ug/g	0.05	0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichloropropane	ug/g	0.05	0.16	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,3-Dichlorobenzene	ug/g	4.8	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene, Total	ug/g	0.05	0.18	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,4-Dichlorobenzene	ug/g	0.083	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Ethyl Ketone	ug/g	16	70	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Methyl Isobutyl Ketone	ug/g	1.7	31	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Acetone	ug/g	16	16	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Bromodichloromethane	ug/g	13	18	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromoform	ug/g	0.27	0.61	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.21	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chlorobenzene	ug/g	2.4	2.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chloroform	ug/g	0.05	0.47	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
cis-1,2-Dichloroethene	ug/g	3.4	55	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	ug/g	9.4	13	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dichlorodifluoromethane	ug/g	16	16	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-Butyl Ether	ug/g	0.75	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	1.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
n-Hexane	ug/g	2.8	46	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	34	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Tetrachloroethylene	ug/g	0.28	4.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-1,2-Dichloroethene	ug/g	0.084	1.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	ug/g	0.061	0.91	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichlorofluoromethane	ug/g	4	4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.032	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Parameter	Unit	REG153 (11) T3-R/P/I SOIL	REG153 (11) T3-I/C/C SOIL	17-101 28-Nov-2017 17-101 SA1	17-108 29-Nov-2017 17-108 SA3	17-108 29-Nov-2017 17-108 SA7	17-109 13-Feb-2018 17-109 SA4	17-111 20-Feb-2018 17-111 SA3	17-20 20-Feb-2018 17-20 SA2	17-20 20-Feb-2018 DUP (Field Duplicate)	17-8 28-Nov-2017 17-08 SA1
Sample Depth	m			0.76 - 1.32	2.24 - 2.9	5.34 - 5.95	3.81 - 4.42	0.76 - 1.37	1.52 - 2.51	1.52 - 2.51	2.29 - 2.9
Semi-VOCs											
1-Methylnaphthalene	ug/g	0.99 (5)	76 (5)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4-Methyl-2-pentanone	ug/g	1.7	31	--	--	<0.50	--	--	<0.50	<0.50	--
Acenaphthene	ug/g	7.9	96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	ug/g	0.15	0.15	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	ug/g	0.67	0.67	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]anthracene	ug/g	0.5	0.96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[a]pyrene	ug/g	0.3	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[b]fluoranthene	ug/g	0.78	0.96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[g,h,i]perylene	ug/g	6.6	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	ug/g	0.78	0.96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	ug/g	7	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenzo[a,h]anthracene	ug/g	0.1	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	ug/g	0.69	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	ug/g	62	62	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno[1,2,3-cd]pyrene	ug/g	0.38	0.76	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Naphthalene	ug/g	0.6	9.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	ug/g	6.2	12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	ug/g	78	96	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	34	--	--	<0.05	--	--	<0.05	<0.05	--

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than REG153 (11) T3-R/P/I SOIL COARSE
Value	Parameter is greater than REG153 (11) T3-I/C/C SOIL COARSE

(1) O.Reg 153 (2011) Table 3 Standards for residential/parkland/institutional property use for coarse textured soil in full depth generic site condition in a non-potable groundwater condition

(2) O.Reg 153 (2011) Table 3 Standards for industrial/commerical/community property use for coarse textured soil in full depth generic site condition in a non-potable groundwater condition

(3) The boron standards are for hot water soluble extract for all surface soils. For subsurface soils the standards are for total boron (mixed strong acid digest), as ecological criteria are not considered.

(4) F1 fraction does not include BTEX; however, the proponent has the choice as to whether or not to subtract BTEX from the analytical result.

Parameter	Unit	REG153 (09) T3-GW COARSE [1]	02-5 28-Feb-2018 02 - 5	02-6 28-Feb-2018 02 - 6	02-6 07-Mar-2018 MW02-6	06-Feb 07-Mar-2018 DUP-P (Field Duplicate)	17-101 11-Dec-2017 17-101	17-108 11-Dec-2017 17-108	17-19 28-Feb-2018 17 - 19	17-21 28-Feb-2018 17 - 21	17-21 21-Mar-2018 17-21	17-25 28-Feb-2018 17 - 25	17-6 28-Feb-2018 17 - 06	17-8 11-Dec-2017 17-08	17-8 11-Dec-2017 DUP1 (Field Duplicate)
General Chemistry															
Conductivity (Field)	ms/cm	-- [2]	1.90	2.93	-	-	7.09	7.09	2.36	2.46	2.27	3.47	1.59	7.09	-
Dissolved Oxygen (Field)	ug/l	--	7130	8250	-	-	870	870	7030	9640	2130	3250	5620	870	-
Oxidation-Reduction Potential (Field)	millivolts	--	219	227	-	-	132	132	140	-7	-137	191	183	132	-
pH (Field)	-	--	7.68	7.73	-	-	7.50	7.50	7.59	1.83	7.60	7.59	7.60	7.50	-
Temperature (Field)	deg c	--	13.72	13.28	-	-	8.82	8.82	11.26	9.44	6.21	13.47	16.91	8.82	-
Turbidity (Field)	NTU	--	198	158	-	-	232	232	30.3	150	24.8	281	800	232	-
PCBs															
Polychlorinated Biphenyls	ug/l	7.8	-	-	<0.1	<0.1	-	-	-	-	-	-	-	<0.1	<0.1

Parameter	Unit	REG153 (09) T3-GW COARSE [1]	02-5 28-Feb-2018 02 - 5	02-6 28-Feb-2018 02 - 6	02-6 28-Feb-2018 DUP026 (Field Duplicate)	17-1 21-Mar-2018 17-1	17-101 11-Dec-2017 17-101	17-108 11-Dec-2017 17-108	17-19 28-Feb-2018 17 - 19	17-21 28-Feb-2018 17 - 21
Petroleum Hydrocarbons										
Benzene	ug/l	44	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	ug/l	2300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m,p-Xylenes	ug/l	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/l	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Petroleum Hydrocarbons - F1 (C6-C10)	ug/l	750 [3]	<25	<25	<25	<25	<25	<25	<25	<25
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	ug/l	750 [3]	<25	<25	<25	<25	<25	<25	<25	<25
Petroleum Hydrocarbons - F2 (C10-C16)	ug/l	150	<100	<100	<100	<100	<100	<100	<100	<100
Petroleum Hydrocarbons - F3 (C16-C34)	ug/l	500	<100	<100	<100	<100	<100	<100	<100	<100
Petroleum Hydrocarbons - F4 (C34-C50)	ug/l	500	<100	<100	<100	<100	<100	<100	<100	<100
Toluene	ug/l	18000	<0.20	<0.20	<0.20	7.3	0.64	0.84	<0.20	<0.20
Xylenes, Total	ug/l	4200	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Parameter	Unit	REG153 (09) T3-GW COARSE [1]	17-21 21-Mar-2018 17-21	17-25 28-Feb-2018 17 - 25	17-6 28-Feb-2018 17 - 06	17-8 11-Dec-2017 17-08	17-8 11-Dec-2017 DUP1 (Field Duplicate)	[TB] 11-Dec-2017 Trip Blank	[TB] 28-Feb-2018 Trip Blank	[TB] 19-Mar-2018 Trip Blank
Petroleum Hydrocarbons										
Benzene	ug/l	44	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	ug/l	2300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m,p-Xylenes	ug/l	--	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/l	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Petroleum Hydrocarbons - F1 (C6-C10)	ug/l	750 [3]	<25	<25	<25	<25	<25	--	<25	--
Petroleum Hydrocarbons - F1 (C6-C10)-BTEX	ug/l	750 [3]	<25	<25	<25	<25	<25	--	<25	--
Petroleum Hydrocarbons - F2 (C10-C16)	ug/l	150	<100	<100	<100	<100	<100	--	--	--
Petroleum Hydrocarbons - F3 (C16-C34)	ug/l	500	<100	<100	<100	<100	<100	--	--	--
Petroleum Hydrocarbons - F4 (C34-C50)	ug/l	500	<100	<100	<100	<100	<100	--	--	--
Toluene	ug/l	18000	<0.20	<0.20	<0.20	0.28	0.32	<0.20	<0.20	<0.20
Xylenes, Total	ug/l	4200	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Parameter	Unit	REG153 (09) T3-GW COARSE [1]	02-5 28-Feb-2018 02 - 5	02-6 28-Feb-2018 02 - 6	02-6 28-Feb-2018 DUP026 (Field Duplicate)	17-1 21-Mar-2018 17-1	17-101 11-Dec-2017 17-101	17-108 11-Dec-2017 17-108	17-19 28-Feb-2018 17 - 19	17-21 28-Feb-2018 17 - 21	17-21 21-Mar-2018 17-21	17-25 28-Feb-2018 17 - 25
VOCs												
1,1,1,2-Tetrachloroethane	ug/l	3.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1-Trichloroethane	ug/l	640	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2,2-Tetrachloroethane	ug/l	3.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2-Trichloroethane	ug/l	4.7	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	ug/l	320	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-Dichloroethylene	ug/l	1.6	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,2-Dibromoethane	ug/l	0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	ug/l	4600	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	ug/l	16	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	ug/l	9600	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene, Total	ug/l	5.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	ug/l	8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Methyl Ethyl Ketone	ug/l	470000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Isobutyl Ketone	ug/l	140000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acetone	ug/l	130000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/l	85000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	ug/l	380	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	5.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbon Tetrachloride	ug/l	0.79	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	ug/l	630	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloroform	ug/l	2.4	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,2-Dichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	ug/l	82000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorodifluoromethane	ug/l	4400	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-Butyl Ether	ug/l	190	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methylene Chloride	ug/l	610	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
n-Hexane	ug/l	51	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Styrene	ug/l	1300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
trans-1,2-Dichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	ug/l	2500	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	ug/l	0.5	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

Parameter	Unit	REG153 (09) T3-GW COARSE [1]	17-6 28-Feb-2018 17 - 06	17-8 11-Dec-2017 17-08	17-8 11-Dec-2017 DUP1 (Field Duplicate)	[TB] 11-Dec-2017 Trip Blank	[TB] 28-Feb-2018 Trip Blank	[TB] 19-Mar-2018 Trip Blank
VOCs								
1,1,1,2-Tetrachloroethane	ug/l	3.4	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,1-Trichloroethane	ug/l	640	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2,2-Tetrachloroethane	ug/l	3.2	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2-Trichloroethane	ug/l	4.7	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	ug/l	320	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-Dichloroethylene	ug/l	1.6	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,2-Dibromoethane	ug/l	0.25	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	ug/l	4600	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichloroethane	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	ug/l	16	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,3-Dichlorobenzene	ug/l	9600	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene, Total	ug/l	5.2	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-Dichlorobenzene	ug/l	8	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Methyl Ethyl Ketone	ug/l	470000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Methyl Isobutyl Ketone	ug/l	140000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acetone	ug/l	130000	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Bromodichloromethane	ug/l	85000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromoform	ug/l	380	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Bromomethane	ug/l	5.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Carbon Tetrachloride	ug/l	0.79	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorobenzene	ug/l	630	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chloroform	ug/l	2.4	<0.20	0.22	0.26	<0.20	<0.20	<0.20
cis-1,2-Dichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	ug/l	82000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dichlorodifluoromethane	ug/l	4400	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-Butyl Ether	ug/l	190	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methylene Chloride	ug/l	610	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
n-Hexane	ug/l	51	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Styrene	ug/l	1300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
trans-1,2-Dichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethene	ug/l	1.6	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	ug/l	2500	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Vinyl Chloride	ug/l	0.5	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17

Footnotes:

Tables should be read in conjunction with the accompanying document.

< Indicates parameter not detected above laboratory method detection limit.

> Indicates parameter detected above equipment analytical range.

-- Chemical not analyzed or criteria not defined.

Value Parameter is greater than REG153 (09) T3-GW COARSE

(1) O.Reg 153 (2009) Table 3 Standards for all types of property use for groundwater in coarse textured soil in full depth generic site condition in a non-potable ground water condition

(2) Not Applicable.

(3) F1 fraction does not include BTEX; however, the proponent has the choice as to whether or not to subtract BTEX from the analytical result.

Figures

KEY MAP

SCALE 1:50,000

LEGEND

- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION
- (1) PCA/APEC 1: TRANSFORMER VAULT
- (2) PCA/APEC 2: PAD MOUNTED TRANSFORMER
- (3) PCA/APEC 3: HYDRAULIC ELEVATOR OIL AST
- (4) PCA/APEC 4: SUSPECTED HISTORIC DRY CLEANER
- (5) PCA/APEC 5: FORMER WALMART AUTO SERVICE BAY
- (6) PCA/APEC 6: WASTE OIL AST
- (7) PCA/APEC 7: FILL OF UNKNOWN QUALITY
- (8) PCA/APEC 8: GASOLINE SERVICE STATION AND GARAGE
- ROADWAY
- APPROXIMATE SITE BOUNDARY

REFERENCE(S)

1. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83,
COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100

1:1,750 METRES

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

CLIENT
RIOCAN MANAGEMENT INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LINCOLN FIELDS SHOPPING MALL, 2525 CARLING AVENUE
OTTAWA, ONTARIO

TITLE
SITE PLAN

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-23
DESIGNED	----
PREPARED	JEM
REVIEWED	AW
APPROVED	BJV

PROJECT NO.	CONTROL	REV.	FIGURE
1780158	0003	0	1

Path: N:\Active\Spatial_IM\RioCan_Management_Inc\Lincoln Field s\99_PROJ\1780158_RIOCAN_Geotech\40_PROD\0003_Phase II_ESA\1780158-0003-HS-0001.mxd

LEGEND

- APPROXIMATE BOREHOLE/MONITORING WELL LOCATION
- ROADWAY
- CROSS-SECTION LOCATION
- APPROXIMATE SITE BOUNDARY
- 9999 GROUNDWATER ELEVATION CONTOUR, metres (MARCH 21, 2018)
- GROUNDWATER ELEVATION CONTOUR, metres
- INTERPRETED GROUNDWATER FLOW DIRECTION

REFERENCE(S)

1. PROJECTION: TRANSVERSE MERCATOR, DATUM: NAD 83, COORDINATE SYSTEM: UTM ZONE 18, VERTICAL DATUM: CGVD28

0 25 50 100

1:1,750 METRES

CLIENT

RIOCAN MANAGEMENT INC.

PROJECT

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LINCOLN FIELDS SHOPPING MALL, 2525 CARLING AVENUE
OTTAWA, ONTARIO

TITLE

GROUNDWATER ELEVATIONS AND INTERPRETED GROUNDWATER FLOW DIRECTION

CONSULTANT

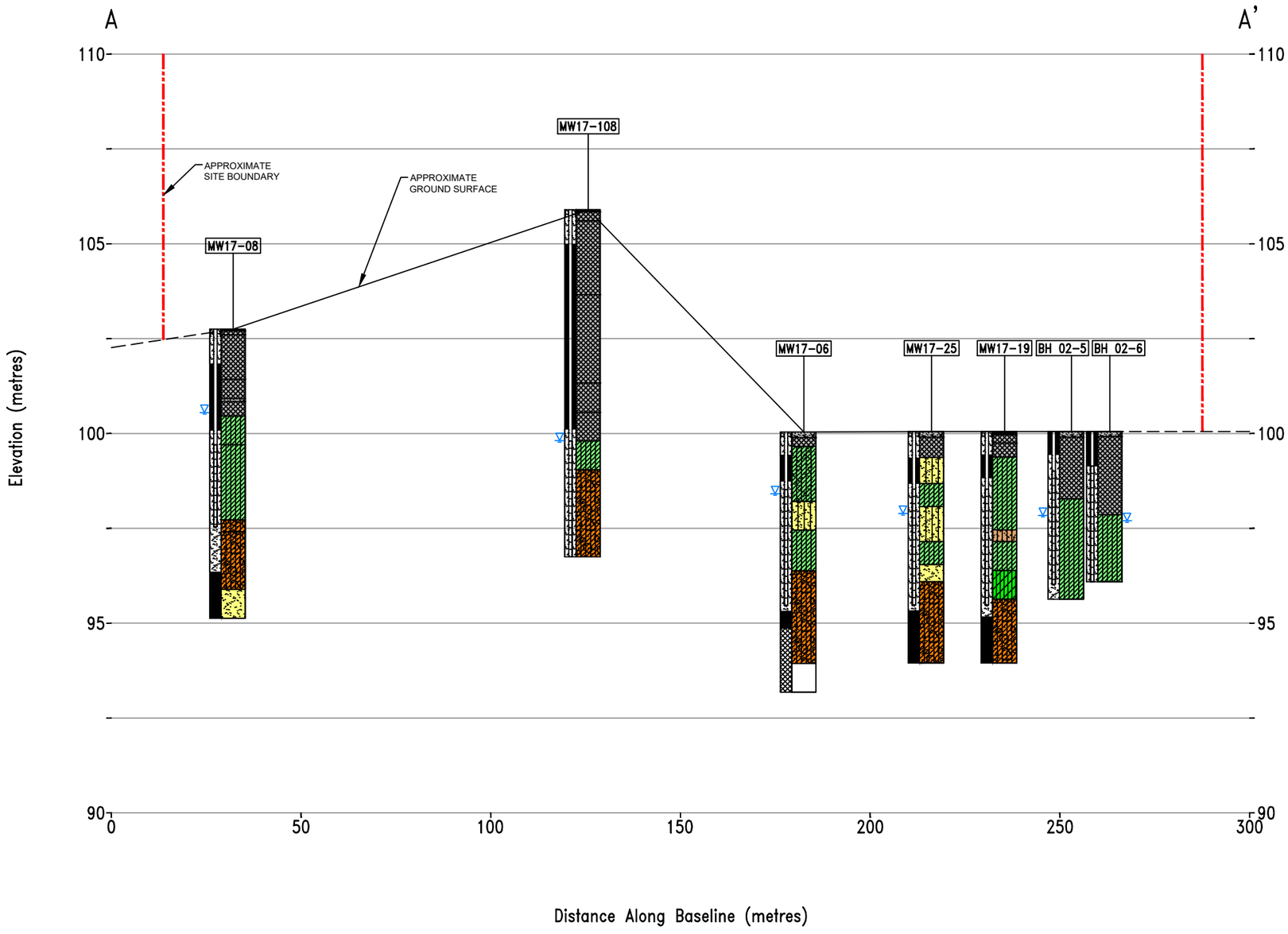
Golder Associates

YYYY-MM-DD	2018-04-23
DESIGNED	----
PREPARED	JEM
REVIEWED	AW
APPROVED	BJV

PROJECT NO.	CONTROL	REV.	FIGURE
1780158	0003	0	**2**

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

Path: N:\Active\Spatial_IM\RioCan_Management_Inc\Lincoln Fields\69_PROJ\1780158_RIOCAN_Geotech\40_PROD\0003_Phase II_ESA\1780158-0003-HS-0002.mxd



LEGEND

BOREHOLE/MONITORING IDENTIFIER → 17-01

GROUNDWATER LEVEL (MARCH 21, 2018)

STRATIGRAPHY

WELL SCREEN

STRATIGRAPHY LEGEND

- ASPHALTIC CONCRETE
- CONCRETE
- FILL
- SILTY CLAY
- SILTY SAND
- GLACIAL TILL
- SAND
- SANDY SILT
- CLAYEY SILT

NOTE(S)

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

0 2.5 5
1:125 VERTICAL METRES

0 25 50
1:1,250 HORIZONTAL METRES

CLIENT
RIOCAN MANAGEMENT INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LINCOLN FIELDS SHOPPING MALL, 2525 CARLING AVENUE
OTTAWA, ONTARIO

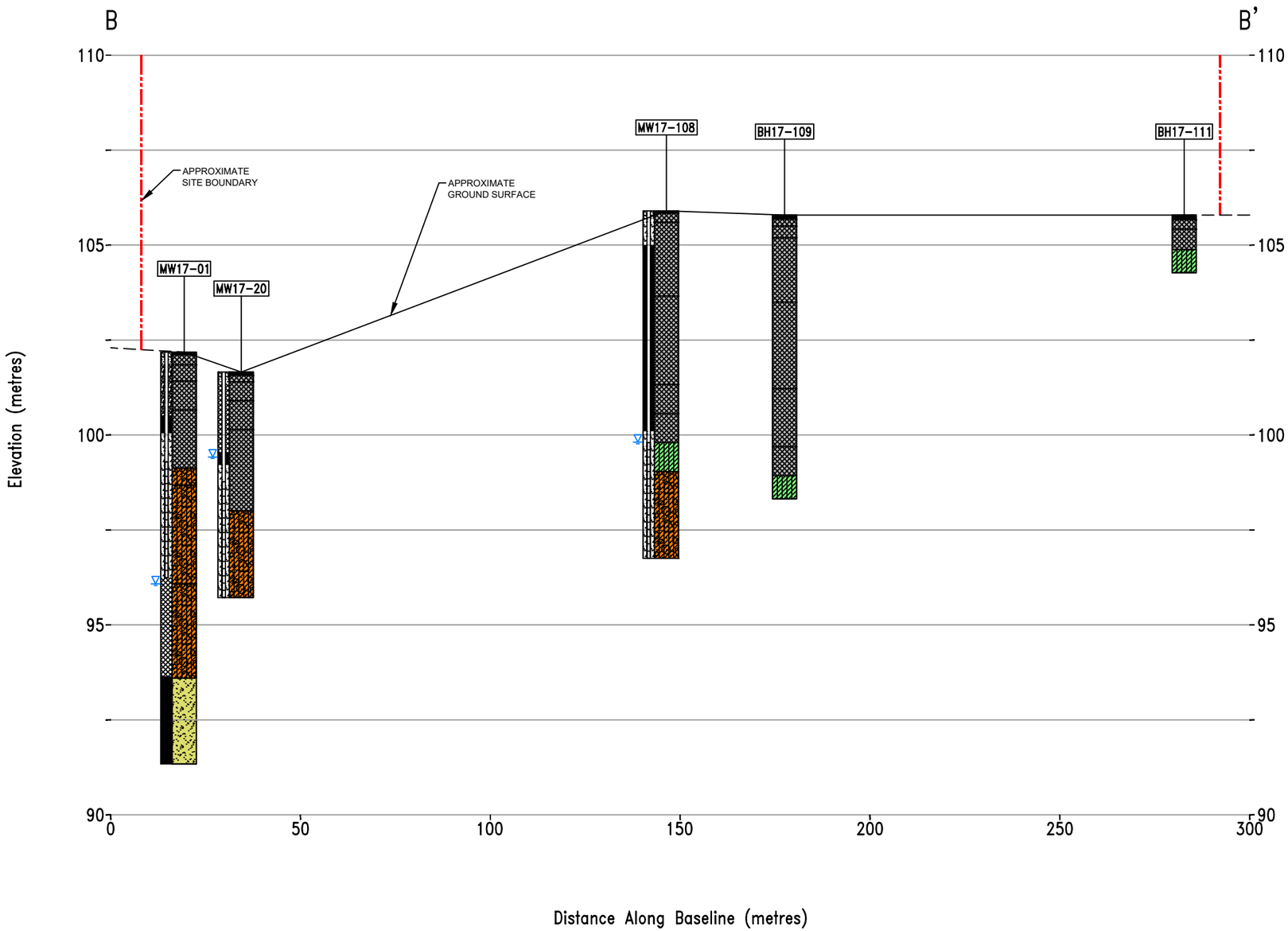
TITLE
GEOLOGICAL CROSS-SECTION A-A'

CONSULTANT

Golder Associates

YYYY-MM-DD	2018-04-23
DESIGNED	----
PREPARED	JEM
REVIEWED	AW
APPROVED	BJV

PROJECT NO.	CONTROL	REV.	FIGURE
1780158	0003	0	3



LEGEND

BOREHOLE/MONITORING IDENTIFIER → 17-01

GROUNDWATER LEVEL (MARCH 21, 2018)

STRATIGRAPHY

WELL SCREEN

STRATIGRAPHY LEGEND

- ASPHALTIC CONCRETE
- CONCRETE
- FILL
- SILTY CLAY
- SILTY SAND
- GLACIAL TILL
- SAND
- SANDY SILT
- CLAYEY SILT

NOTE(S)

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

0 2.5 5
1:125 METRES

0 25 50
1:1,250 METRES

CLIENT
RIOCAN MANAGEMENT INC.

PROJECT
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT
LINCOLN FIELDS SHOPPING MALL, 2525 CARLING AVENUE
OTTAWA, ONTARIO

TITLE
GEOLOGICAL CROSS-SECTION B-B'

CONSULTANT
Golder Associates

YYYY-MM-DD	2018-04-23
DESIGNED	----
PREPARED	JEM
REVIEWED	AW
APPROVED	BJV

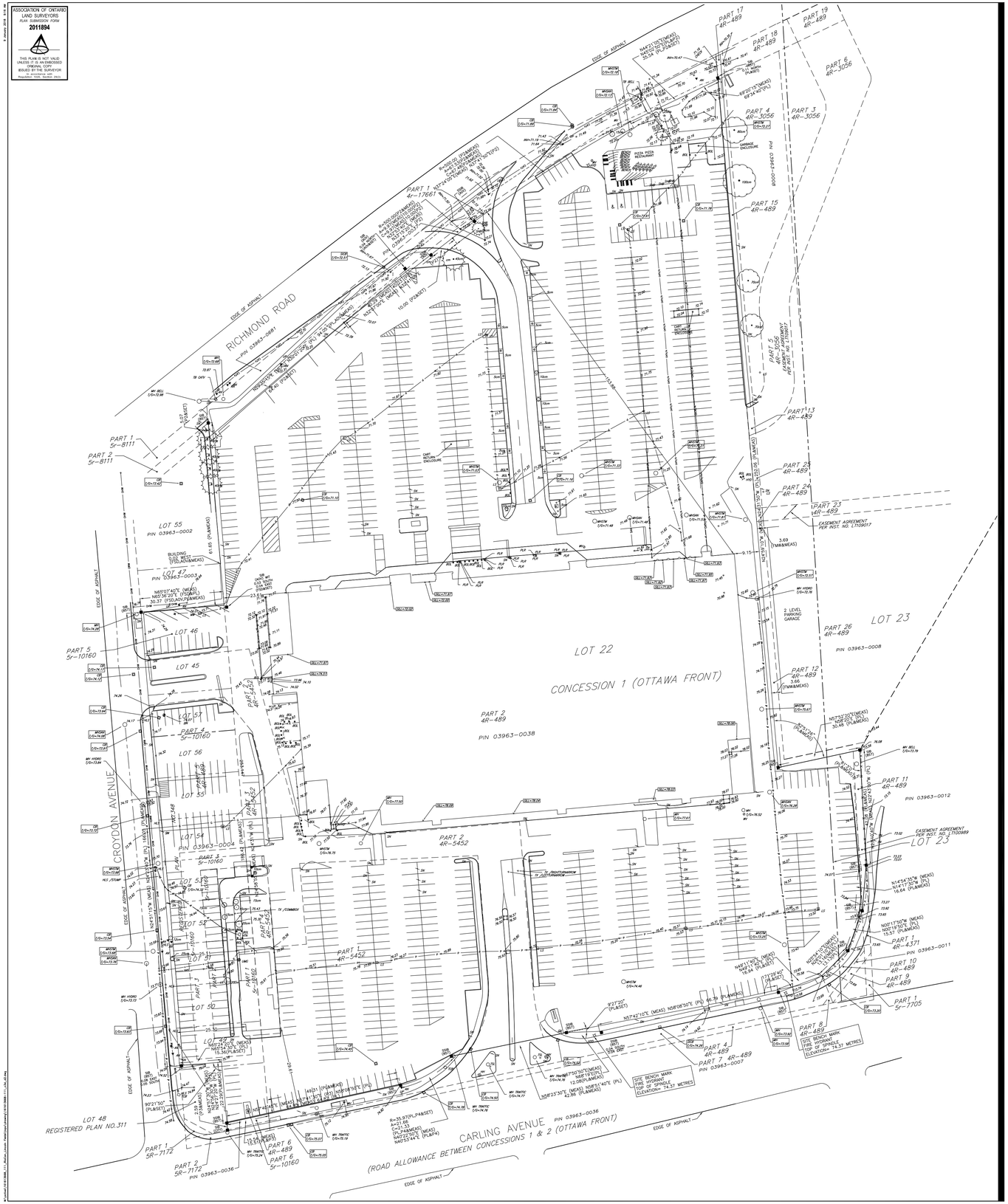
PROJECT NO.	CONTROL	REV.	FIGURE
1780158	0003	0	4

APPENDIX A

Plan of Survey

ASSOCIATION OF ONTARIO LAND SURVEYORS
PLAN SUBMISSION FORM
2011894

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR
In accordance with Regulation 1026, Section 29(3)



Stantec

Stantec Geomatics Ltd.
400 - 1331 Clyde Avenue
Ottawa ON
tel. 613.722.4420
www.stantec.com

TOPOGRAPHIC PLAN of

LOTS 45, 46, 50 TO 57 INCLUSIVE AND PART OF LOT 49 REGISTERED PLAN NO. 348 AND PART OF LOT 48 REGISTERED PLAN NO. 311 AND PART OF LOTS 22 & 23 CONCESSION 1 (OTTAWA FRONT)

(GEOGRAPHIC TOWNSHIP OF NEPEAN)

CITY OF OTTAWA

Scale 1:500
10 0 10 20 30 METRES

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

HORIZONTAL DATUM NOTE
PROJECTION: UNIVERSAL TRANSVERSE MERCATOR
(MTM, ZONE 9, CM 76°30'W)
DATUM: NAD 83 (ORIGINAL)

DISTANCES ON THIS PLAN MAY BE CONVERTED TO GROUND DISTANCES BY DIVIDING BY A COMBINED SCALE FACTOR OF 0.9999.4.

VERTICAL DATUM NOTE
ELEVATIONS SHOWN HEREON ARE GEODETIC (CGVD=1928:1978) AND ARE DERIVED FROM THE CAN-NET VRS NETWORK AND CITY OF OTTAWA MONUMENT N=62 HAVING AN ELEVATION OF 69.238 METRES.

SITE BENCH MARK ARE AS SHOWN.

BEARING NOTE
BEARINGS ARE GRID, DERIVED FROM THE CAN-NET VRS NETWORK GPS OBSERVATIONS ON NCC HORIZONTAL CONTROL MONUMENTS 19773033 AND 19680191, CENTRAL MERIDIAN, 76°30' WEST LONGITUDE MTM ZONE 9, NAD83(ORIGINAL).

19773033 N:5006060.42 E:3240888.04
19680191 N:5003564.26 E:3880064.94

LEGEND

■	DENOTES	FOUND MONUMENTS
□	-	SET MONUMENTS
IB	-	IRON BAR
IB@	-	ROUND IRON BAR
SIB	-	STANDARD IRON BAR
SSIB	-	SHORT STANDARD IRON BAR
CC	-	CUT CROSS
CP	-	CONCRETE PIN
WIT	-	WITNESS
PIN	-	PROPERTY IDENTIFICATION NUMBER
MEAS	-	MEASURED
PROP	-	PROPORTIONED
OU	-	ORIGIN UNKNOWN
SG	-	STANTEC GEOMATICS LTD.
ORP	-	OBSERVED REFERENCE POINT
PL	-	PLAN 4R-489
P2	-	PLAN 4R-17661
P3	-	PLAN 4R-5452
P4	-	PLAN 4R-5472
1303	-	L.V. MARTIN O.L.S.
857	-	FAIRHALL, MOFFATT & WOODLAND LTD.
AC/U	-	AIR CONDITIONING UNIT
AN	-	ANCHOR
AP	-	AIR PUMP
ANT	-	ANTENNA
BH	-	BOREHOLE
BIB	-	HOSE BIB
BKR	-	BIKE RACK
BENCH	-	BENCH
BOL	-	BOLLARD
BOUL	-	BOULDER
CB	-	CATCH BASIN
DCB	-	DOUBLE CB
CBMH	-	CB MANHOLE
DCBMH	-	DOUBLE CB MANHOLE
CBSI	-	SIDE INLET CB
CHM	-	CHIMNEY
CSV	-	VALVE CURB STOP
DRN	-	DRAIN
EPOST	-	ELECTRICAL OUTLET
FP	-	FLAG POLE
FL	-	FLOOD LIGHT
FTF	-	FUEL TANK FILLER CAP
GC	-	GARBAGE CAN
GTC	-	PIPE FLANGE (GAS)
GTF	-	GAS FUEL TANK
GP	-	GUARD PIPE
GSR	-	GAS SERVICE REGULATOR
GV	-	GAS VALVE
HC	-	HICKENBOTTOM
HDS	-	HEADSTONE
HLS	-	LIGHT STANDARD HYDRO
HM	-	HYDRO METER
HTR	-	HYDRO TRANSFORMER
HW	-	HAND WELL
HYD	-	FIRE HYDRANT
HB	-	HYDRO/BELL BOX
LOG	-	LOGBOOM
MP	-	MONITORING PIN
MH	-	MAINTENANCE HOLE UNIDENTIFIED
MHB	-	MAINTENANCE HOLE BELL
MHF	-	MAINTENANCE HOLE FIBRE OPTIC
MHH	-	MAINTENANCE HOLE HYDRO
MHI	-	MAINTENANCE HOLE INVERT
MHSA	-	MAINTENANCE HOLE SANITARY
MHST	-	MAINTENANCE HOLE STORM
MHT	-	MAINTENANCE HOLE TRAFFIC
MW	-	MONITORING WELL
NPB	-	NEWS PAPER BOX
OLP	-	LIGHT STANDARD ORNAMENTAL
OW	-	OBSERVATION WELL
PKM	-	PARKING METER
PLBX	-	PULL BOX
PLQ	-	PLAQUE
PLR	-	PILLAR
PZ	-	PIEZOMETER
RLC	-	RED LIGHT CAMERA
RSL	-	RAILWAY SIGNAL LIGHT
RWS	-	RAILWAY SWITCH STAND
SAT	-	SATELLITE DISH
SCLP	-	SCULPTURE
SCP	-	SUMP/CATCH PIT
SCV	-	SPRINKLER CONTROL VALVE
SH	-	SPRINKLER HEAD
SM	-	SIAMESE CONNECTION
SN	-	SIGN
SPAN	-	SOLAR PANEL
SPT	-	SEPTIC TANK LID
ST	-	STUB
TB BELL	-	TERMINAL BOX - BELL
TB CATV	-	TERMINAL BOX - CABLE
TCB	-	TRAFFIC CONTROL BOX
TPIT	-	TEST PIT
TSL	-	TRAFFIC SIGNAL LIGHT
UMB	-	MARKER BELL UNDERGROUND
UMC	-	MARKER CABLE UNDERGROUND
UMG	-	MARKER GAS UNDERGROUND
UMO	-	MARKER OIL UNDERGROUND
UP	-	UTILITY POLE
VC	-	VALVE CHAMBER
VL	-	VALVE CHAMBER
WV	-	WATER VALVE
	-	TREE STUMP
	-	TREE CONIFEROUS
	-	TREE DECIDUOUS

SURVEYOR'S CERTIFICATE
I CERTIFY THAT :
1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON THE 23rd DAY OF JUNE, 2017 .

DATE

BRIAN J. WEBSTER
ONTARIO LAND SURVEYOR

DRAWN: CT CHECKED: BW PM: BW FIELD: ES/CA PROJECT No.: 161613668-111

APPENDIX B

Sampling and Analysis Plan

Area of Potential Environmental Concern	Rationale	Location	Borehole/ Monitoring Well Location ID	Well Installed (Y/N)	Depth and/or Screen Length	Soil Samples[1]	Groundwater Samples[2]
APEC 1 - Transformer Vault On-Site. APEC 5 - Former Automotive Garage with Associated Oil ASTs and Oil Water Separator.	Borehole completed to assess potential soil impacts, and existing monitoring well from 2002 investigation used to assess potential groundwater impacts related to the presence of the on-Site transformer vault (PHCs, PCBs) and the former automotive garage (PHCs).	East side of the former Walmart Garage within second most eastern bay.	MW02-6	Y	4.42 m - Screen 0.95 to 4.00 m	None (existing well)	Groundwater sample will be analyzed for PHCs, VOCs, and PCBs.
		East side of the former Walmart Garage within second most eastern bay. Three feet away from existing well.	BH17-23	N	5.10 m - no well	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs, VOCs, and PCBs	N/A
	Boreholes, some completed with monitoring wells, and existing monitoring well from 2002 investigation, used to assess potential soil or groundwater impacts related to the presence the former automotive garage and its associated oil ASTs and oil-water separator (PHCs, VOCs).	West side of the former Walmart Garage within most western bay.	MW02-5	Y	3.96 m - Screen 0.91 to 3.96 m	None (existing well)	Groundwater sample will be analyzed for PHCs, and VOCs.
		West side of the former Walmart Garage approximately 5 m south of MW02-5.	BH17-24	N	6.10 m - no well	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs and VOCs.	N/A
		In the northeast corner of the former Walmart. Located approximately 7 m west of the door to the former garage.	BH17-25	Y	6.10 m - Screen 1.52 - 4.57 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs and VOCs.	Groundwater sample will be analyzed for PHCs, and VOCs.
APEC 2 - Pad mounted Transformer APEC 7 - Fill of Unknown Quality	Borehole completed with monitoring well to assess potential soil or groundwater impacts related to the presence the pad mounted transformer (PHCs, PCBS), and fill of unknown quality on-Site (Metals, PAHs).	Located in the southwest quadrant of the Site north of the Wendy's a few meters east of the transformer.	BH17-08	Y	7.02 m - Screen 3.05 to 6.10 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, pH, PAHs, BTEX, and PCBs	Groundwater sample will be analyzed for PHCs, VOCs, and PCBs.
APEC 3 - Oil AST for Hydraulic Elevator	Borehole completed with monitoring well to assess potential soil or groundwater impacts related to the presence the Hydraulic Oil AST (PHCs).	Centre of the shopping centre on the west side of the former Walmart.	BH17-06	Y	6.86 m - Screen 1.52 to 4.57 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs and VOCs.	Groundwater sample will be analyzed for PHCs and VOCs.
APEC 4 - Suspected Former Dry Cleaning Activities APEC 7 - Fill of Unknown Quality	Borehole completed with monitoring well, **and VOC analysis added to all samples** to assess potential soil or groundwater impacts related to suspected former dry cleaning activities on Site (VOCs), and fill of unknown quality on-Site (Metals, PAHs).	Located on the central south side of the Shopping centre. Nearcurrent dry cleaning depot.	BH17-108	Y	9.15 m - Screen 6.10 to 9.15 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: O.Reg 153 Metals, PHCs, PAHs and VOCs.	Groundwater sample will be analyzed for PHCs and VOCs.
APEC 6 - Waste Oil AST for Former Garage APEC 7 - Fill of Unknown Quality	Borehole completed with monitoring well to assess potential soil or groundwater impacts related to the presence the waste oil AST (PHCs), and fill of unknown quality on-Site (Metals, PAHs).	Located outside, north of the former Walmart Automotive Garage, and ~3 m east of the AST.	BH17-19	Y	6.10 m - Screen 1.52 - 4.57 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, pH, PAHs, BTEX, and PCBs	Groundwater sample will be analyzed for PHCs and VOCs.
APEC 7 - Fill of Unknown Quality	Boreholes completed to assess potential soil impacts related to the presence of the fill across the Site (Metals, PAHs, PHCs, BTEX, and pH).	In the west parking lot approximately 50 m west of the shopping centre.	BH17-101	Y	6.70 m - Screen 3.20 to 6.25 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, PAHs, BTEX	Groundwater sample will be analyzed for PHCs and VOCs.
		Just off the side walk to the south and centred of the shopping centre.	BH17-109	N	7.47 m - no well	One soil sample selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, pH, PAHs, and BTEX.	N/A
		Southeast corner of the property in the parking lot.	BH17-111	N	1.52 m - no well	One soil sample selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, pH, PAHs, and BTEX.	N/A
APEC 7 - Fill of Unknown Quality APEC 8 - Former Off-Site Gasoline Service Station	Borehole completed with monitoring well to assess potential soil or groundwater impacts related to the presence the waste oil AST (PHCs), and fill of unknown quality on-Site (Metals, PAHs, and pH).	Adjacent to the southeast corner of the Quickie property, on-Site.	BH17-20	Y	5.94 m - Screen 2.89 to 5.94 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for some or all of the following: PHCs, Metals, pH, PAHs, and VOCs.	Groundwater sample will be analyzed for PHCs and VOCs.
APEC 8 - Former Off-Site Gasoline Service Station	Boreholes completed with monitoring wells to assess potential soil or groundwater impacts related to the presence of the off-Site source.	Most western point on-Site, adjacent to the southwest corner of the Quickie property.	BH17-01	Y	10.82 m - Screen 2.89 to 5.94 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs and VOCs.	Groundwater sample will be analyzed for PHCs and VOCs.
		East of the Quickie property, adjacent to the Quickie building, on-Site.	BH17-21	Y	5.94 m - Screen 2.89 to 5.94 m	Two soil samples selected based on field screening measurements and/or estimated depth of contamination. Submitted for: PHCs and VOCs.	Groundwater sample will be analyzed for PHCs and VOCs.

1: Three (3) duplicate soil samples from three different boreholes will be submitted for quality assurance purposes of all parameters.
2: Two (2) duplicate groundwater samples from two of the wells will be submitted for quality assurance purposes of all parameters.
3: One (1) VOC trip blank will be submitted along with each groundwater VOC sample submission for quality assurance purposes of VOCs.

APPENDIX C

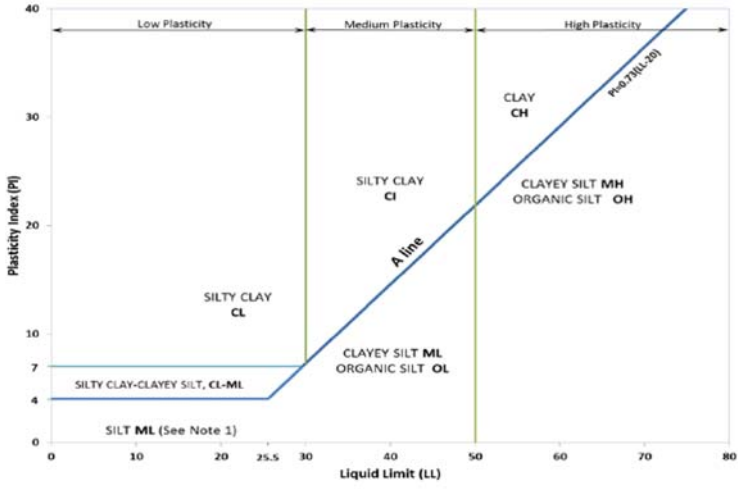
Borehole Logs

METHOD OF SOIL CLASSIFICATION

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

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

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



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

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

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

ABBREVIATIONS AND TERMS USED ON RECORDS OF BORHEOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

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

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

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

PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg (140 lb) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split-spoon sampler for a distance of 300 mm (12 in.).

Cone Penetration Test (CPT)

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

Dynamic Cone Penetration Resistance (DCPT); N_d:

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

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

SAMPLES

AS	Auger sample
BS	Block sample
CS	Chunk sample
DD	Diamond Drilling
DO or DP	Seamless open ended, driven or pushed tube sampler – note size
DS	Denison type sample
FS	Foil sample
GS	Grab Sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler – note size
ST	Slotted tube
TO	Thin-walled, open – note size
TP	Thin-walled, piston – note size
WS	Wash sample

SOIL TESTS

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

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

NON-COHESIVE (COHESIONLESS) SOILS

Compactness[2]

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

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

Field Moisture Condition

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

COHESIVE SOILS

Consistency

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

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

Water Content

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

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

I. GENERAL

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

II. STRESS AND STRAIN

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

III. SOIL PROPERTIES

(a) Index Properties

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

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

(a) Index Properties (continued)

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

(b) Hydraulic Properties

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

(c) Consolidation (one-dimensional)

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

(d) Shear Strength

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

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

2 shear strength = (compressive strength)/2

PROJECT: 1780158

RECORD OF BOREHOLE: 17-01

SHEET 1 OF 2

LOCATION: N 5023779.3 ;E 438303.4

BORING DATE: February 21, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* 20 40 60 80 / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		74.10						
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.07						Flush Mount Casing
		FILL - (SW/GW) gravelly SAND to sandy GRAVEL, some non-plastic fines; grey (PAVEMENT STRUCTURE)		73.77 0.33						
		FILL - (CI) SILTY CLAY, some sand, trace gravel; brown, contains cobbles and boulders; cohesive, w>PL		73.34 0.76						
1		FILL - (SM) SILTY SAND, some gravel; brown; non-cohesive, moist, compact			1	SS	28	⊕		Gravel
				72.58						
		FILL - (SM/ML) SILTY SAND to sandy SILT, some gravel to gravelly; brown, contains cobbles and boulders; non-cohesive, wet, compact		1.52	2	SS	24	⊕		Bentonite Seal
2					3	SS	13	⊕		Silica Sand
3				71.05						
		(ML) sandy SILT, some gavel; brown (GLACIAL TILL); non-cohesive, wet, compact		3.05	4	SS	12	⊕		
				70.60						
		(ML) CLAYEY sandy SILT, some gravel to gravelly; grey, contains cobbles (GLACIAL TILL); non-cohesive, wet, very loose to compact		3.50	5	SS	8	⊕		
4										32 mm Diam. PVC #10 Slot Screen
					6	SS	4	⊕		
5										
					7	SS	16	⊕		
6				68.00						
		(SM) gravelly SILTY SAND; grey, contains cobbles (GLACIAL TILL); non-cohesive, wet, very dense		6.10	8	SS	68			
7										Cave
					9	SS	>50			
8				65.52						
		Borehole continued on RECORD OF DRILLHOLE 17-1		8.58						
9										Bentonite Seal
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: KM

CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF DRILLHOLE: 17-01

SHEET 2 OF 2

LOCATION: N 5023779.3 ;E 438303.4

DRILLING DATE: February 21, 2018

DATUM: CGVD28

INCLINATION: -90° AZIMUTH: ---

DRILL RIG: CME 75

DRILLING CONTRACTOR: M3/Grenville Drilling

JN - Joint; FLT - Fault; SHR- Shear; VN - Vein; CJ - Conjugate
BD- Bedding; FO- Foliation; CO- Contact; OR- Orthogonal; CL - Cleavage
PL - Planar; CU- Curved; UN- Undulating; ST - Stepped; IR - Irregular
PO- Polished; K - Slickensided; SM- Smooth; Ro - Rough; MB- Mechanical Break
BR - Broken Rock
NOTE: For additional abbreviations refer to list of abbreviations & symbols.

DEPTH SCALE METRES	DRILLING RECORD	DESCRIPTION	SYMBOLIC LOG	ELEV. / DEPTH (m)	RUN No.	COLOUR % RETURN / FLUSH	RECOVERY: TOTAL CORE %	RECOVERY: SOLID CORE %	R.Q.D. %	FRACT. INDEX PER 0.25 m	DISCONTINUITY DATA: B Angle	DISCONTINUITY DATA: DIP w.r.t. CORE AXIS	DISCONTINUITY DATA: TYPE AND SURFACE DESCRIPTION	Jcon	Jr	Ja	ROCK STRENGTH INDEX	WEATHERING INDEX	Q AVG.	
		BEDROCK SURFACE		65.52																
9	Rotary Drill / NQ Core	Slightly weathered to fresh, medium strong to strong SANDSTONE, with thinly bedded shale partings - Broken core from 8.58 m to 8.90 m		8.58	1	95														Bentonite Seal
10					2	95														
				63.26																
11		End of Drillhole		10.84																WL in Screen at Elev. 70.86 m on Feb. 27, 2018
12																				
13																				
14																				
15																				
16																				
17																				
18																				

DEPTH SCALE

1 : 50

GOLDER

LOGGED: KM

CHECKED: BJV

MIS-RCK 004 1780158-ENVIRO.GPJ GAL-MISS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-06

SHEET 1 OF 1

LOCATION: N 5023803.7 ;E 438426.8

BORING DATE: July 19, 2017

DATUM: CGVD28

SAMPLER HAMMER, 32kg; DROP, 760mm

PENETRATION TEST HAMMER, 32kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* (20 40 60 80) / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		74.26							
	Wash Boring / NW Casing	CONCRETE		0.00							Flush Mount Casing
		FILL - (GW) sandy GRAVEL, angular; grey		0.15 / 73.88	1	76	20	⊕ ND			Silica Sand
		(CL/ML/SM) SILTY CLAY, CLAYEY SILT and SILTY SAND, fine; grey brown (WEATHERED CRUST), thinly to thickly laminated; cohesive, w~PL, very stiff		0.38	2	SS	9	⊕ ND			
1					3	SS	12	⊕			Bentonite Seal / Silica Sand
				72.43							
2		(SM) SILTY SAND, fine; brown, contains clayey silt seams; non-cohesive, wet, loose		1.83	4	SS	8	⊕ ND			
				71.67							
		(CI/CH) SILTY CLAY; grey brown, contains silty sand seams (WEATHERED CRUST); cohesive, w>PL, firm		2.59	5	SS	4	⊕ ND			
3	Continuous Spoon / 50 mm Diam.				6	SS	-	⊕ ND			32 mm Diam. PVC #10 Slot Screen
				70.60							
		(ML) gravelly sandy SILT, some low plastic fines; grey (GLACIAL TILL); non-cohesive, wet, loose to compact		3.66	7	SS	6	⊕ ND			
4					8	SS	10	⊕ ND			Silica Sand
					9	SS	5	⊕ ND			Bentonite Seal
5					10	SS	11	⊕ ND			
				68.16							Cave
6	DCPT / Open Hole	DCPT		6.10							
				67.40							
7		End of Borehole		6.86							WL in Screen at Elev. 72.66 m on Feb. 27, 2018
8											
9											
10											

DEPTH SCALE

1 : 50

GOLDER

LOGGED: PAH

CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-08

SHEET 1 OF 1

LOCATION: N 5023668.6 ;E 438359.9

BORING DATE: November 28, 2017

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected ⊕	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected □	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT Wp W Wl	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		74.67								
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.05								Flush Mount Casing
		FILL - (SW) gravelly SAND, angular; grey (PAVEMENT STRUCTURE)		0.15								
		FILL - (SP) SAND, fine to medium, trace silt; brown; non-cohesive, moist, compact			1	SS	14	⊕				Silica Sand
1				73.35								
		FILL - (SM) SILTY SAND, some gravel; dark brown; non-cohesive, moist, compact		1.32								
				72.84	2	SS	29	⊕				Bentonite Seal
		CONCRETE - Mud Slab?		1.83								
2		FILL - (SM) gravelly SILTY SAND; brown; non-cohesive, moist, compact		1.91								▽
				72.38								
		(CL/CI) SILTY CLAY, trace to some sand; grey brown, highly fissured, contains thin laminations to very thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL, stiff		2.29	3	SS	3	⊕				
3				71.62								Silica Sand
		(CL/CI) SILTY CLAY, trace to some sand, trace gravel; grey, contains thin laminations to thin beds of silty sand; cohesive, w>PL, stiff		3.05	4	SS	1	⊕				
					5	SS	1	⊕				50 mm Diam. PVC #10 Slot Screen
4												
					6	SS	WH	⊕				
5				69.64								
		(SM/ML) gravelly SILTY SAND to sandy SILT, some plastic fines; grey (GLACIAL TILL); non-cohesive, wet, very loose		5.03								
				69.33								
		(ML/SM) gravelly SILTY SAND to sandy SILT, trace to some plastic fines; grey (GLACIAL TILL); non-cohesive, wet, very loose to compact		5.34	7	SS	1	⊕				Silica Sand
6												
					8	SS	15	⊕				
				67.81								
		(SP) SAND, some non-plastic fines; grey, stratified; non-cohesive, moist, very dense		6.86	9	SS	52	⊕				Bentonite Seal
7				67.05								
		End of Borehole		7.62								
8												WL in Screen at Elev. 72.47 m on Dec. 5, 2017
9												
10												

DEPTH SCALE

1 : 50

GOLDER

LOGGED: RI

CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-19

SHEET 1 OF 1

LOCATION: N 5023854.6 ;E 438451.3

BORING DATE: July 21, 2017

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] (ND = Not Detected) ⊕	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] (ND = Not Detected) □	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		71.84								
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.00								Flush Mount Casing
		FILL - (SW) gravelly SAND, angular; grey, contains recycled asphalt (PAVEMENT STRUCTURE)		0.09 / 71.54	1	GRAB	-	ND				Silica Sand
		FILL - (GW) sandy GRAVEL, angular; grey, contains recycled asphalt (PAVEMENT STRUCTURE)		0.30 / 71.17								
1		(CI/CH) SILTY CLAY; grey brown, fissured, contains silty sand seams (WEATHERED CRUST); cohesive, w~PL, very stiff to stiff		0.67	2	SS	4	ND				Bentonite Seal
												Silica Sand
2					3	SS	3	ND				
				69.25								
		(ML) sandy SILT; brown; non-cohesive, wet, loose		2.59 / 68.94	4	SS	3					
3		(CI/CH) SILTY CLAY to CLAY; grey brown to grey, contains silty sand seams (WEATHERED CRUST); cohesive, w>PL, very stiff		2.90	5	SS	5					32 mm Diam. PVC #10 Slot Screen
				68.18								
		(ML) CLAYEY SILT, some sand, trace gravel; grey; non-cohesive, wet, very loose		3.66	6	SS	1	ND				
4				67.42								
		(ML) sandy SILT, some low plastic fines, some gravel; grey (GLACIAL TILL); non-cohesive, wet, loose to compact		4.42	7	SS	5					Silica Sand
5												Bentonite Seal
					8	SS	12					
6				65.74								
		End of Borehole		6.10								WL in Screen at Elev. 69.48 m on Feb. 27, 2018
7												
8												
9												
10												

DEPTH SCALE
1 : 50

GOLDER

LOGGED: PAH
CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-20

SHEET 1 OF 1

LOCATION: N 5023785.7 ;E 438321.0

BORING DATE: February 20, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* (20 40 60 80) / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		73.52						
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.00						Flush Mount Casing
		FILL - (SW) gravelly SAND, angular; grey (PAVEMENT STRUCTURE)		0.09						
		FILL - (Cl) sandy SILTY CLAY, trace gravel; brown, contains, cobbles; cohesive, w>PL		0.26 72.76						
1		FILL - (ML) CLAYEY sandy SILT, trace gravel; brown, contains cobbles and boulders; non-cohesive, moist, compact		0.76	1	SS	20 ⊕			Native Backfill
				72.00						
2		FILL - (SM) gravelly SILTY SAND, trace to some low plasticity fines; brown, contains cobbles and boulders; non-cohesive, moist, loose to very dense		1.52	2	SS	9 ⊕			
					3	SS	>50 ⊕			Bentonite Seal
										Silica Sand
3					4	SS	9 ⊕			
				69.86						
		(ML) sandy SILT, some gravel to gravelly, some low plasticity fines; grey (GLACIAL TILL); non-cohesive, moist, loose to compact		3.66						
4					5	SS	6			
										32 mm Diam. PVC #10 Slot Screen
5					6	SS	12 ⊕			
					7	SS	25 ⊕			
				67.58						
6		End of Borehole		5.94						
7										
8										
9										
10										

DEPTH SCALE

1 : 50

GOLDER

LOGGED: KM

CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-21

SHEET 1 OF 1

LOCATION: N 5023811.2 ;E 438317.9

BORING DATE: February 22, 2018

DATUM: CGVD28

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* 20 40 60 80 / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		72.68						
0	Power Auger 200 mm Diam. (Hollow Stem)	ASPHALTIC CONCRETE		0.00						Flush Mount Casing
		FILL - (SW) gravelly SAND, angular; brown (PAVEMENT STRUCTURE)		0.10 72.35						
		FILL - (ML/CI) sandy CLAYEY SILT to sandy SILTY CLAY; grey brown, contains cobbles and boulders; cohesive, w>PL, very stiff		0.33						
1				71.61	1	SS	19 ⊕			
		FILL - (ML) sandy SILT, some gravel; brown and grey, contains cobbles and boulders; non-cohesive, moist, compact to loose		1.07						Gravel
					2	SS	5 ⊕			
2				70.55						
		(ML/SM) sandy SILT to SILTY SAND, some gravel to gravelly; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, compact to very loose		2.13	3	SS	10 ⊕			Bentonite Seal
										Silica Sand
3					4	SS	1 ⊕			
				68.87						
		(ML) sandy SILT, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, very loose to compact		3.81	5	SS	4 ⊕			
4										32 mm Diam. PVC #10 Slot Screen
					6	SS	19 ⊕			
5				67.35						
		(SM) SILTY SAND, some gravel to gravelly; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, moist, very dense		5.33	7	SS	>50 ⊕			
				66.74						
6		End of Borehole		5.94						WL in Screen at Elev. 70.48 m on Feb. 27, 2018
7										
8										
9										
10										

DEPTH SCALE
1 : 50

GOLDER

LOGGED: KM
CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-23

SHEET 1 OF 1

LOCATION: N 5023855.1 ;E 438477.2

BORING DATE: July 17-18, 2017

DATUM: CGVD28

SAMPLER HAMMER, 32kg; DROP, 760mm

PENETRATION TEST HAMMER, 32kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* 20 40 60 80 / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp — W — Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		71.50						
0	Split Spoon / Open Hole	CONCRETE FLOOR		0.00						
		FILL - (SW) gravelly SAND, angular; grey brown; non-cohesive, dry, very dense		0.11 71.05	1	SS	32	⊕ ND		
		(CI/CH) SILTY CLAY; grey brown, fissured, contains silty sand seams (WEATHERED CRUST); cohesive, w~PL, very stiff		0.45	2	SS	30	⊕ ND		
1					3	SS	12	⊕ ND		
		(SM) SILTY SAND, fine; grey brown; non-cohesive, wet, loose		69.75 1.75	4	SS	11	⊕ ND		
2		(CI/CH) SILTY CLAY; grey brown, fissured, contains silty sand seams (WEATHERED CRUST); cohesive, w~PL, very stiff		69.06 2.44	5	SS	7	⊕ ND		
		(CI/CH) SILTY CLAY; grey, contains silty sand seams; cohesive, w>PL, stiff to firm		68.30 3.20	6	SS	10	⊕ ND		
3					7	SS	9	⊕ ND		
4					8	SS	7	⊕ ND		
		(SM-ML) SILTY SAND to sandy SILT, some gravel; grey with clayey silt seams (GLACIAL TILL); non-cohesive, wet, dense		66.62 4.88 66.39	9	SS	>50	⊕		
5		End of Borehole Sampler Refusal		5.11						
6										
7										
8										
9										
10										

DEPTH SCALE
1 : 50

GOLDER

LOGGED: PAH
CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-24

SHEET 1 OF 1

LOCATION: N 5023844.6 ;E 438456.6

BORING DATE: July 17, 2017

DATUM: CGVD28

SAMPLER HAMMER, 32kg; DROP, 760mm

PENETRATION TEST HAMMER, 32kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ *ND = Not Detected* 20 40 60 80 / HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] □ *ND = Not Detected* 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s 10^{-6} 10^{-5} 10^{-4} 10^{-3} / WATER CONTENT PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		72.68						
0	Wash Boring / NW Casing	CONCRETE		0.00						
		FILL - (GW) sandy GRAVEL, angular; grey brown, contains plastic pieces		0.10 / 72.38	1	76	15	⊕ ND		
		(CI/CH) SILTY CLAY; grey brown, fissured, contains silty sand seams (WEATHERED CRUST)		0.30 / 72.07				⊕ ND		
		(CL/ML) SILTY CLAY to CLAYEY SILT; grey brown, fissured, contains sand layers (WEATHERED CRUST); cohesive, w~PL, very stiff		0.61	2	SS	15	⊕ ND		
1					3	SS	16	⊕ ND		
					4	SS	7	⊕ ND		
2					5	SS	12	⊕ ND		
		(ML) CLAYEY SILT, some sand, fine, trace gravel; grey to brown; non-cohesive, wet, compact		69.94 / 2.74	6	SS	16	⊕		
3					7	SS	28	⊕ ND		
		(ML/SM) sandy SILT to SILTY SAND, some gravel; grey, contains clayey silt seams (GLACIAL TILL); non-cohesive, wet, compact		69.02 / 3.66	8	SS	28	⊕ ND		
4					9	SS	-	⊕		
					10	SS	11	⊕ ND		
5										
		End of Borehole		66.58 / 6.10						
6										
7										
8										
9										
10										

DEPTH SCALE
1 : 50

GOLDER

LOGGED: PAH
CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

PROJECT: 1780158

RECORD OF BOREHOLE: 17-25

SHEET 1 OF 1

LOCATION: N 5023836.5 ;E 438437.4

BORING DATE: July 18, 2017

DATUM: CGVD28

SAMPLER HAMMER, 32kg; DROP, 760mm

PENETRATION TEST HAMMER, 32kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected (20 40 60 80) ⊕	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected (20 40 60 80) □	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	WATER CONTENT PERCENT Wp — W — Wl (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		72.50									
0	Wash Boring / NW Casing	CONCRETE FLOOR		0.00									Flush Mount Casing
		FILL - (SW/GW) SAND and GRAVEL, angular; grey brown; non-cohesive, moist, compact		0.15	1	76	15	⊕					Silica Sand
				71.82									
1		(SM) SILTY SAND, fine; brown, contains clayey silt seams; non-cohesive, moist, compact		0.68	2	76	12	⊕					Bentonite Seal
				71.13									
		(CL/ML) SILTY CLAY and CLAYEY SILT; grey brown, contains sand layers (WEATHERED CRUST); cohesive, w~PL, very stiff		1.37	3	SS	17	⊕					Silica Sand
				70.52									
2		(SM) SILTY SAND; grey brown, contains clayey silt seams; non-cohesive, wet, loose		1.98	4	SS	8	⊕					
					5	SS	7	⊕					
				69.60									
3		(CI/CH) SILTY CLAY; grey brown, contains sand seams (WEATHERED CRUST); cohesive, w>PL, very stiff		2.90	6	SS	9	⊕					32 mm Diam. PVC #10 Slot Screen
				68.99									
		(SP) SAND, fine, some non-plastic fines; grey; non-cohesive, wet, loose		3.51	7	SS	-	⊕					
				68.54									
4		(ML) sandy SILT, some low plastic fines, some gravel; grey (GLACIAL TILL); non-cohesive, wet, loose to compact		3.96	8	SS	9	⊕					Silica Sand
5					9	SS	22	⊕					Bentonite Seal
					10	SS	16	⊕					
6				66.40									
		End of Borehole		6.10									WL in Screen at Elev. 70.26 m on Feb. 27, 2018
7													
8													
9													
10													

DEPTH SCALE

1 : 50

GOLDER

LOGGED: PAH

CHECKED: BJV

MIS-BHS 001 1780158-ENVIRO.GPJ GAL-MIS.GDT 4/23/18 ZS

APPENDIX D

Laboratory Certificates of Analysis

SOIL

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z314189

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Mar 05, 2018

PAGES (INCLUDING COVER): 19

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086480	9086484
Antimony	µg/g	40	7.5	0.8		<0.8[<B]	<0.8[<B]	<0.8[<B]
Arsenic	µg/g	18	18	1		1[<A]	2[<A]	1[<A]
Boron	µg/g	120	120	5		<5[<A]	6[<A]	<5[<A]
Barium	µg/g	670	390	2		290[<B]	93[<B]	29[<B]
Beryllium	µg/g	8	4	0.5		0.6[<B]	<0.5[<B]	<0.5[<B]
Cadmium	µg/g	1.9	1.2	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]
Chromium	µg/g	160	160	2		55[<A]	13[<A]	7[<A]
Cobalt	µg/g	80	22	0.5		15.9[<B]	7.1[<B]	3.8[<B]
Copper	µg/g	230	140	1		33[<B]	13[<B]	9[<B]
Lead	µg/g	120	120	1		7[<A]	6[<A]	3[<A]
Molybdenum	µg/g	40	6.9	0.5		<0.5[<B]	1.0[<B]	<0.5[<B]
Nickel	µg/g	270	100	1		34[<B]	13[<B]	6[<B]
Selenium	µg/g	5.5	2.4	0.4		<0.4[<B]	<0.4[<B]	<0.4[<B]
Silver	µg/g	40	20	0.2		<0.2[<B]	<0.2[<B]	<0.2[<B]
Thallium	µg/g	3.3	1	0.4		<0.4[<B]	<0.4[<B]	<0.4[<B]
Uranium	µg/g	33	23	0.5		0.7[<B]	<0.5[<B]	<0.5[<B]
Vanadium	µg/g	86	86	1		55[<A]	16[<A]	12[<A]
Zinc	µg/g	340	340	5		90[<A]	19[<A]	12[<A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086480	9086484
pH, 2:1 CaCl2 Extraction	pH Units			NA		8.27	7.84	7.95
Sodium Adsorption Ratio	NA	12	5	NA		49.2[>A]	17.4[>A]	42.7[>A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9086484 SAR was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

				SAMPLE DESCRIPTION:	17-21 SA1
				SAMPLE TYPE:	Soil
				DATE SAMPLED:	2018-02-22
Parameter	Unit	G / S: A	G / S: B	RDL	9086482
pH, 2:1 CaCl2 Extraction	pH Units			NA	7.61

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086482 pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4
					SAMPLE TYPE:	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9086476**	**9086480**	**9086484**
Naphthalene	µg/g	9.6	0.6	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Acenaphthylene	µg/g	0.15	0.15	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]
Acenaphthene	µg/g	96	7.9	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Fluorene	µg/g	62	62	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]
Phenanthrene	µg/g	12	6.2	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Anthracene	µg/g	0.67	0.67	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]
Fluoranthene	µg/g	9.6	0.69	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Pyrene	µg/g	96	78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Benz(a)anthracene	µg/g	0.96	0.5	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Chrysene	µg/g	9.6	7	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(b)fluoranthene	µg/g	0.96	0.78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(k)fluoranthene	µg/g	0.96	0.78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(a)pyrene	µg/g	0.3	0.3	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.38	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Dibenz(a,h)anthracene	µg/g	0.1	0.1	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]
Benzo(g,h,i)perylene	µg/g	9.6	6.6	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
2-and 1-methyl Naphthalene	µg/g	76	0.99	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]
Surrogate	**Unit**		**Acceptable Limits**					
Chrysene-d12	%		50-140			99	100	82

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9086484 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

Certified By: NPopowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2018-02-23 **DATE REPORTED: 2018-03-05**

					SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA5	17-21 SA1	17-21 SA3
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-22	2018-02-21
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9086478**	**9086479**	**9086481**	**9086482**	**9086483**
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]	<10[<B]	<10[<B]	<10[<B]
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]	NA[<B]	NA[<B]	NA[<B]
Moisture Content	%			0.1		10.8	10.0	6.9	17.9	11.3
Surrogate	**Unit**	**Acceptable Limits**								
Terphenyl	%	60-140				76	83	74	73	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086478-9086483 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By: NPopowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

				SAMPLE DESCRIPTION:	17-20 SA2
				SAMPLE TYPE:	Soil
				DATE SAMPLED:	2018-02-20
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**	**9086480**
F1 (C6 to C10)	µg/g	55	55	5	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10	<10[<B]
F2 (C10 to C16) minus Naphthalene	µg/g			10	<10
F3 (C16 to C34)	µg/g	1700	300	50	<50[<B]
F3 (C16 to C34) minus PAHs	µg/g			50	<50
F4 (C34 to C50)	µg/g	3300	2800	50	<50[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50	NA[<B]
Moisture Content	%			0.1	11.4
Surrogate	**Unit**	**Acceptable Limits**			
Terphenyl	%	60-140			133

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086480 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

					SAMPLE DESCRIPTION:	17-111 SA3	17-109 SA4
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-13
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9086476**	**9086484**
Benzene	µg/g	0.32	0.21	0.02		<0.02[<B]	<0.02[<B]
Toluene	µg/g	68	2.3	0.08		<0.08[<B]	<0.08[<B]
Ethylbenzene	µg/g	9.5	2	0.05		<0.05[<B]	<0.05[<B]
Xylene Mixture	µg/g	26	3.1	0.05		<0.05[<B]	<0.05[<B]
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]
F2 (C10 to C16) minus Naphthalene	µg/g			10		<10	<10
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	210[<B]
F3 (C16 to C34) minus PAHs	µg/g			50		<50	210
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	110[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]
Moisture Content	%			0.1		10.3	5.0
Surrogate	**Unit**		**Acceptable Limits**				
Terphenyl	%		60-140			110	120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9086484 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-05

					SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA2	17-20 SA5	17-21 SA1	17-21 SA3
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-20	2018-02-22	2018-02-21
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9086478**	**9086479**	**9086480**	**9086481**	**9086482**	**9086483**
Dichlorodifluoromethane	µg/g	16	16	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Vinyl Chloride	ug/g	0.032	0.02	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Bromomethane	ug/g	0.05	0.05	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Trichlorofluoromethane	ug/g	4	4	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Acetone	ug/g	16	16	0.50		<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]
1,1-Dichloroethylene	ug/g	0.064	0.05	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methylene Chloride	ug/g	1.6	0.1	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.084	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methyl tert-butyl Ether	ug/g	11	0.75	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1-Dichloroethane	ug/g	17	3.5	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Methyl Ethyl Ketone	ug/g	70	16	0.50		<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]
Cis- 1,2-Dichloroethylene	ug/g	55	3.4	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Chloroform	ug/g	0.47	0.05	0.04		<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
1,2-Dichloroethane	ug/g	0.05	0.05	0.03		<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]
1,1,1-Trichloroethane	ug/g	6.1	0.38	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Carbon Tetrachloride	ug/g	0.21	0.05	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzene	ug/g	0.32	0.21	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
1,2-Dichloropropane	ug/g	0.16	0.05	0.03		<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]
Trichloroethylene	ug/g	0.91	0.061	0.03		<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]
Bromodichloromethane	ug/g	18	13	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methyl Isobutyl Ketone	ug/g	31	1.7	0.50		<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]
1,1,2-Trichloroethane	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]
Toluene	ug/g	68	2.3	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Dibromochloromethane	ug/g	13	9.4	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ethylene Dibromide	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]
Tetrachloroethylene	ug/g	4.5	0.28	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.058	0.04		<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
Chlorobenzene	ug/g	2.4	2.4	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ethylbenzene	ug/g	9.5	2	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
m & p-Xylene	ug/g			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23 **DATE REPORTED: 2018-03-05**

					SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA2	17-20 SA5	17-21 SA1	17-21 SA3
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-20	2018-02-22	2018-02-21
Parameter	**Unit**	**G / S: A**	**G / S: B**	**RDL**		**9086478**	**9086479**	**9086480**	**9086481**	**9086482**	**9086483**
Bromoform	ug/g	0.61	0.27	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Styrene	ug/g	34	0.7	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
o-Xylene	ug/g			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	9.6	4.8	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,4-Dichlorobenzene	ug/g	0.2	0.083	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,2-Dichlorobenzene	ug/g	6.8	3.4	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Xylene Mixture	ug/g	26	3.1	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,3-Dichloropropene	µg/g	0.18	0.05	0.04		<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
n-Hexane	µg/g	46	2.8	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Surrogate	**Unit**		**Acceptable Limits**								
Toluene-d8	% Recovery		50-140			107	95	94	92	92	91
4-Bromofluorobenzene	% Recovery		50-140			80	85	79	89	81	83

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086478-9086483 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9086476	17-111 SA3	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	49.2
9086476	17-111 SA3	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	49.2
9086480	17-20 SA2	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	17.4
9086480	17-20 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	17.4
9086484	17-109 SA4	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	42.7
9086484	17-109 SA4	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	42.7

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Mar 05, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	9081332		<0.8	<0.8	NA	< 0.8	108%	70%	130%	105%	80%	120%	78%	70%	130%
Arsenic	9081332		1	1	NA	< 1	107%	70%	130%	101%	80%	120%	99%	70%	130%
Boron	9081332		<5	<5	NA	< 5	71%	70%	130%	111%	80%	120%	71%	70%	130%
Barium	9081332		203	204	0.5%	< 2	102%	70%	130%	99%	80%	120%	103%	70%	130%
Beryllium	9081332		0.5	<0.5	NA	< 0.5	93%	70%	130%	113%	80%	120%	73%	70%	130%
Cadmium	9081332		<0.5	<0.5	NA	< 0.5	105%	70%	130%	99%	80%	120%	98%	70%	130%
Chromium	9081332		51	50	2.0%	< 2	93%	70%	130%	100%	80%	120%	110%	70%	130%
Cobalt	9081332		13.8	13.8	0.0%	< 0.5	96%	70%	130%	103%	80%	120%	95%	70%	130%
Copper	9081332		30	29	3.4%	< 1	94%	70%	130%	104%	80%	120%	88%	70%	130%
Lead	9081332		5	5	0.0%	< 1	109%	70%	130%	91%	80%	120%	90%	70%	130%
Molybdenum	9081332		<0.5	<0.5	NA	< 0.5	98%	70%	130%	101%	80%	120%	100%	70%	130%
Nickel	9081332		32	31	3.2%	< 1	99%	70%	130%	110%	80%	120%	100%	70%	130%
Selenium	9081332		<0.4	<0.4	NA	< 0.4	110%	70%	130%	102%	80%	120%	97%	70%	130%
Silver	9081332		<0.2	<0.2	NA	< 0.2	89%	70%	130%	95%	80%	120%	91%	70%	130%
Thallium	9081332		<0.4	<0.4	NA	< 0.4	112%	70%	130%	103%	80%	120%	103%	70%	130%
Uranium	9081332		<0.5	<0.5	NA	< 0.5	91%	70%	130%	101%	80%	120%	102%	70%	130%
Vanadium	9081332		48	46	4.3%	< 1	84%	70%	130%	95%	80%	120%	94%	70%	130%
Zinc	9081332		85	83	2.4%	< 5	103%	70%	130%	104%	80%	120%	100%	70%	130%
O. Reg. 153(511) - ORPs (Soil)															
pH, 2:1 CaCl2 Extraction	9092575		7.49	7.51	0.3%	NA	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio	9090102		2.42	2.44	0.8%	NA	NA			NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Mar 05, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	9081930		< 0.02	< 0.02	NA	< 0.02	91%	60%	130%	86%	60%	130%	105%	60%	130%
Toluene	9081930		< 0.08	< 0.08	NA	< 0.08	89%	60%	130%	87%	60%	130%	107%	60%	130%
Ethylbenzene	9081930		< 0.05	< 0.05	NA	< 0.05	89%	60%	130%	88%	60%	130%	110%	60%	130%
Xylene Mixture	9081930		< 0.05	< 0.05	NA	< 0.05	88%	60%	130%	88%	60%	130%	104%	60%	130%
F1 (C6 to C10)	9081930		< 5	< 5	NA	< 5	89%	60%	130%	88%	85%	115%	97%	70%	130%
F2 (C10 to C16)	9086385		< 10	< 10	NA	< 10	92%	60%	130%	84%	80%	120%	83%	70%	130%
F3 (C16 to C34)	9086385		< 50	< 50	NA	< 50	92%	60%	130%	88%	80%	120%	91%	70%	130%
F4 (C34 to C50)	9086385		< 50	< 50	NA	< 50	96%	60%	130%	97%	80%	120%	102%	70%	130%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	9079035		< 0.02	< 0.02	NA	< 0.02	110%	60%	130%	92%	60%	130%	101%	60%	130%
Toluene	9079035		< 0.08	< 0.08	NA	< 0.08	109%	60%	130%	95%	60%	130%	106%	60%	130%
Ethylbenzene	9079035		< 0.05	< 0.05	NA	< 0.05	109%	60%	130%	99%	60%	130%	109%	60%	130%
Xylene Mixture	9079035		< 0.05	< 0.05	NA	< 0.05	105%	60%	130%	93%	60%	130%	102%	60%	130%
F1 (C6 to C10)	9045803		< 5	< 5	NA	< 5	84%	60%	130%	90%	85%	115%	94%	70%	130%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	115%	50%	140%	94%	50%	140%
Vinyl Chloride	9086386		< 0.02	< 0.02	NA	< 0.02	101%	50%	140%	113%	50%	140%	80%	50%	140%
Bromomethane	9086386		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	113%	50%	140%	86%	50%	140%
Trichlorofluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	119%	50%	140%	82%	50%	140%
Acetone	9086386		< 0.50	< 0.50	NA	< 0.50	100%	50%	140%	108%	50%	140%	98%	50%	140%
1,1-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	102%	60%	130%	88%	50%	140%
Methylene Chloride	9086386		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	98%	60%	130%	85%	50%	140%
Trans- 1,2-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	73%	50%	140%	98%	60%	130%	78%	50%	140%
Methyl tert-butyl Ether	9086386		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	95%	60%	130%	75%	50%	140%
1,1-Dichloroethane	9086386		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	95%	60%	130%	95%	50%	140%
Methyl Ethyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	87%	50%	140%	99%	50%	140%	81%	50%	140%
Cis- 1,2-Dichloroethylene	9086386		< 0.02	< 0.02	NA	< 0.02	77%	50%	140%	106%	60%	130%	84%	50%	140%
Chloroform	9086386		< 0.04	< 0.04	NA	< 0.04	85%	50%	140%	102%	60%	130%	97%	50%	140%
1,2-Dichloroethane	9086386		< 0.03	< 0.03	NA	< 0.03	87%	50%	140%	100%	60%	130%	96%	50%	140%
1,1,1-Trichloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	97%	60%	130%	87%	50%	140%
Carbon Tetrachloride	9086386		< 0.05	< 0.05	NA	< 0.05	72%	50%	140%	102%	60%	130%	70%	50%	140%
Benzene	9086386		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	90%	60%	130%	78%	50%	140%
1,2-Dichloropropane	9086386		< 0.03	< 0.03	NA	< 0.03	80%	50%	140%	102%	60%	130%	85%	50%	140%
Trichloroethylene	9086386		< 0.03	< 0.03	NA	< 0.03	88%	50%	140%	98%	60%	130%	78%	50%	140%
Bromodichloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	105%	60%	130%	91%	50%	140%
Methyl Isobutyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	101%	50%	140%	95%	50%	140%	88%	50%	140%
1,1,2-Trichloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	93%	50%	140%	110%	60%	130%	101%	50%	140%
Toluene	9086386		< 0.02	< 0.02	NA	< 0.02	88%	50%	140%	101%	60%	130%	82%	50%	140%
Dibromochloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	101%	60%	130%	92%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 05, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Ethylene Dibromide	9086386		< 0.04	< 0.04	NA	< 0.04	87%	50%	140%	101%	60%	130%	92%	50%	140%
Tetrachloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	106%	60%	130%	80%	50%	140%
1,1,1,2-Tetrachloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	101%	50%	140%	99%	60%	130%	89%	50%	140%
Chlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	97%	60%	130%	82%	50%	140%
Ethylbenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	101%	60%	130%	71%	50%	140%
m & p-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	110%	60%	130%	84%	50%	140%
Bromoform	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	101%	60%	130%	91%	50%	140%
Styrene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	92%	60%	130%	83%	50%	140%
1,1,2,2-Tetrachloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	108%	60%	130%	106%	50%	140%
o-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	104%	60%	130%	88%	50%	140%
1,3-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	85%	60%	130%	93%	50%	140%
1,4-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	91%	60%	130%	81%	50%	140%
1,2-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	92%	60%	130%	80%	50%	140%
1,3-Dichloropropene	9086386		< 0.04	< 0.04	NA	< 0.04	105%	50%	140%	98%	60%	130%	114%	50%	140%
n-Hexane	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	100%	60%	130%	88%	50%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	9083880		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	96%	50%	140%	75%	50%	140%
Acenaphthylene	9083880		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	106%	50%	140%	84%	50%	140%
Acenaphthene	9083880		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	99%	50%	140%	81%	50%	140%
Fluorene	9083880		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	115%	50%	140%	98%	50%	140%
Phenanthrene	9083880		0.21	0.21	NA	< 0.05	116%	50%	140%	110%	50%	140%	112%	50%	140%
Anthracene	9083880		< 0.05	0.05	NA	< 0.05	96%	50%	140%	91%	50%	140%	101%	50%	140%
Fluoranthene	9083880		0.46	0.49	6.3%	< 0.05	111%	50%	140%	107%	50%	140%	113%	50%	140%
Pyrene	9083880		0.37	0.40	7.8%	< 0.05	109%	50%	140%	108%	50%	140%	113%	50%	140%
Benz(a)anthracene	9083880		0.19	0.21	NA	< 0.05	99%	50%	140%	102%	50%	140%	106%	50%	140%
Chrysene	9083880		0.18	0.19	NA	< 0.05	99%	50%	140%	110%	50%	140%	109%	50%	140%
Benzo(b)fluoranthene	9083880		0.35	0.33	5.9%	< 0.05	84%	50%	140%	94%	50%	140%	90%	50%	140%
Benzo(k)fluoranthene	9083880		0.16	0.15	NA	< 0.05	87%	50%	140%	87%	50%	140%	79%	50%	140%
Benzo(a)pyrene	9083880		0.23	0.22	NA	< 0.05	97%	50%	140%	92%	50%	140%	91%	50%	140%
Indeno(1,2,3-cd)pyrene	9083880		0.08	0.09	NA	< 0.05	93%	50%	140%	101%	50%	140%	81%	50%	140%
Dibenz(a,h)anthracene	9083880		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	100%	50%	140%	94%	50%	140%
Benzo(g,h,i)perylene	9083880		0.09	0.09	NA	< 0.05	77%	50%	140%	87%	50%	140%	76%	50%	140%
2-and 1-methyl Naphthalene	9083880		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	85%	50%	140%	68%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: NPopnikoloff

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 05, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	pH METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P &T GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P & T GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	Balance
Moisture Content	VOL-91-5009	CCME Tier 1 Method, SW846 5035,8015	BALANCE
Terphenyl	VOL-91-5009	CCME Tier 1 Method	GC/FID
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

1 LARGE RED

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 1823141189

Cooler Quantity: one-onice

Arrival Temperatures: 1.8 | 1.5 | 1.3 | 1.2 | 1.3 | 1.2

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: ON ICE

Report Information:

Company: Golder
Contact: Alex Wood
Address: 1931 Robertson Rd

Phone: 613-408-4804 Fax:

Reports to be sent to:
1. Email: alexwood@golder.com
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☒ Res/Park
☐ Agriculture

Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region _____ (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other

_____ (Indicate One)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1780158
Site Location: Lincoln Fields
Sampled By: Kim MacDonald
AGAT Quote #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals)	O. Reg 153: ORPs (☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR)	Full Metals Scan	Regulation/Custom Metals	Nutrients (☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2)	Volatiles (☒ VOC ☐ BTEX ☐ THM)	CCME Fractions 1 to 4	ABNs	PAHs	PCBs (☐ Total ☐ Aroclors)	Organochlorine Pesticides	TCLP (☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs)	Sewer Use
17-111 SA 3	See Jar		3	S					X				X		X				
17-01 SA3	↓		3	S								X	X						
17-01 SA4			3	S								X	X						
17-20 SA2			3	S					X			X	X		X				
17-20 SA5			3	S								X	X						
17-21 SA1			3	S								X	X						
17-21 SA3			3	S								X	X						
17-109 SA4	Feb 13/18		3	S					X				X		X				

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Alex Wood AWood			CBerthelet	23-Feb-18	12h30
CBOO GOLDER	23Feb18	15h00	PARDEEP BOPARAI	24/02/18	9:55 AM

Page _____ of _____

N°: T 041794

Document ID: DIV-78-1511.013

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

Date Issued: September 20, 2016

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1783221

AGAT WORK ORDER: 17Z240230

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Jul 31, 2017

PAGES (INCLUDING COVER): 13

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - PCBs (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

		SAMPLE DESCRIPTION:		17-23 (SA-2)	17-23 (SA-4)	17-23 (SA-14)
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-07-17	2017-07-17	2017-07-17
Parameter	Unit	G / S	RDL	8578470	8578483	8578488
Aroclor 1242	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1248	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1254	µg/g		0.1	<0.1	<0.1	<0.1
Aroclor 1260	µg/g		0.1	<0.1	<0.1	<0.1
Polychlorinated Biphenyls	µg/g	0.35	0.1	<0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits				
Decachlorobiphenyl	%	60-140		120	96	116

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8578470-8578488 Results are based on the dry weight of soil extracted.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

		SAMPLE DESCRIPTION:		17-6 (SA-4)	17-6 (SA-7)	17-23 (SA-2)	17-23 (SA-4)	17-23 (SA-14)	17-24 (SA-1)	17-24 (SA-5)	17-25 (SA-3)
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18
Parameter	Unit	G / S	RDL	8578449	8578468	8578470	8578483	8578488	8578490	8578502	8578507
F1 (C6 to C10)	µg/g	55	5	<5	<5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	<50	<50	<50	<50	<50	<50	<50	<50
F4 (C34 to C50)	µg/g	2800	50	<50	<50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	17.1	13.0	25.3	20.2	18.4	22.9	31.9	26.2
Surrogate	Unit	Acceptable Limits									
Terphenyl	%	60-140		99	74	98	87	107	104	95	103

		SAMPLE DESCRIPTION:		17-25 (SA-6)
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-18
Parameter	Unit	G / S	RDL	8578509
F1 (C6 to C10)	µg/g	55	5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5
F2 (C10 to C16)	µg/g	98	10	<10
F3 (C16 to C34)	µg/g	300	50	<50
F4 (C34 to C50)	µg/g	2800	50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA
Moisture Content	%		0.1	30.9
Surrogate	Unit	Acceptable Limits		
Terphenyl	%	60-140		73

Certified By: NPopowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8578449-8578509 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By: N Popowkolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

SAMPLE DESCRIPTION:				17-6 (SA-4)	17-6 (SA-7)	17-23 (SA-2)	17-23 (SA-4)	17-23 (SA-14)	17-24 (SA-1)	17-24 (SA-5)	17-25 (SA-3)
SAMPLE TYPE:				Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-07-19	2017-07-19	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18
Parameter	Unit	G / S	RDL	8578449	8578468	8578470	8578483	8578488	8578490	8578502	8578507
Dichlorodifluoromethane	µg/g	16	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g	4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acetone	ug/g	16	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1-Dichloroethylene	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g	0.084	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tert-butyl Ether	ug/g	0.75	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g	3.5	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Methyl Ethyl Ketone	ug/g	16	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g	3.4	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Chloroform	ug/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
1,1,1-Trichloroethane	ug/g	0.38	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzene	ug/g	0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
1,2-Dichloropropane	ug/g	0.05	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Trichloroethylene	ug/g	0.061	0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Bromodichloromethane	ug/g	13	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g	1.7	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Toluene	ug/g	2.3	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Dibromochloromethane	ug/g	9.4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Tetrachloroethylene	ug/g	0.28	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Chlorobenzene	ug/g	2.4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ethylbenzene	ug/g	2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

		SAMPLE DESCRIPTION:		17-6 (SA-4)	17-6 (SA-7)	17-23 (SA-2)	17-23 (SA-4)	17-23 (SA-14)	17-24 (SA-1)	17-24 (SA-5)	17-25 (SA-3)
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-07-19	2017-07-19	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-17	2017-07-18
Parameter	Unit	G / S	RDL	8578449	8578468	8578470	8578483	8578488	8578490	8578502	8578507
Bromoform	ug/g	0.27	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Styrene	ug/g	0.7	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
o-Xylene	ug/g		0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	4.8	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g	0.083	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g	3.4	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	ug/g	3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichloropropene	µg/g	0.05	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
n-Hexane	µg/g	2.8	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	17.1	13.0	25.3	20.2	18.4	22.9	31.9	26.2
Surrogate	Unit	Acceptable Limits									
Toluene-d8	% Recovery	50-140		86	88	86	83	86	87	86	87
4-Bromofluorobenzene	% Recovery	50-140		88	87	90	88	89	91	88	88

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

		SAMPLE DESCRIPTION:		17-25 (SA-6)
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-18
Parameter	Unit	G / S	RDL	8578509
Dichlorodifluoromethane	µg/g	16	0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.02	<0.02
Bromomethane	ug/g	0.05	0.05	<0.05
Trichlorofluoromethane	ug/g	4	0.05	<0.05
Acetone	ug/g	16	0.50	<0.50
1,1-Dichloroethylene	ug/g	0.05	0.05	<0.05
Methylene Chloride	ug/g	0.1	0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g	0.084	0.05	<0.05
Methyl tert-butyl Ether	ug/g	0.75	0.05	<0.05
1,1-Dichloroethane	ug/g	3.5	0.02	<0.02
Methyl Ethyl Ketone	ug/g	16	0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g	3.4	0.02	<0.02
Chloroform	ug/g	0.05	0.04	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	<0.03
1,1,1-Trichloroethane	ug/g	0.38	0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.05	<0.05
Benzene	ug/g	0.21	0.02	<0.02
1,2-Dichloropropane	ug/g	0.05	0.03	<0.03
Trichloroethylene	ug/g	0.061	0.03	<0.03
Bromodichloromethane	ug/g	13	0.05	<0.05
Methyl Isobutyl Ketone	ug/g	1.7	0.50	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	<0.04
Toluene	ug/g	2.3	0.02	<0.02
Dibromochloromethane	ug/g	9.4	0.05	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	<0.04
Tetrachloroethylene	ug/g	0.28	0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.04	<0.04
Chlorobenzene	ug/g	2.4	0.05	<0.05
Ethylbenzene	ug/g	2	0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-21

DATE REPORTED: 2017-07-31

		SAMPLE DESCRIPTION:		17-25 (SA-6)
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-18
Parameter	Unit	G / S	RDL	8578509
Bromoform	ug/g	0.27	0.05	<0.05
Styrene	ug/g	0.7	0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05
o-Xylene	ug/g		0.05	<0.05
1,3-Dichlorobenzene	ug/g	4.8	0.05	<0.05
1,4-Dichlorobenzene	ug/g	0.083	0.05	<0.05
1,2-Dichlorobenzene	ug/g	3.4	0.05	<0.05
Xylene Mixture	ug/g	3.1	0.05	<0.05
1,3-Dichloropropene	µg/g	0.05	0.04	<0.04
n-Hexane	µg/g	2.8	0.05	<0.05
Moisture Content	%		0.1	30.9
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140		84
4-Bromofluorobenzene	% Recovery	50-140		86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8578449-8578509 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
PROJECT: 1783221
SAMPLING SITE:Lincoln Fields

AGAT WORK ORDER: 17Z240230
ATTENTION TO: Alex Wood
SAMPLED BY:P.H.

Trace Organics Analysis

RPT Date: Jul 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)															
F1 (C6 to C10)	8582484		< 5	< 5	NA	< 5	71%	60%	130%	87%	85%	115%	77%	70%	130%
F2 (C10 to C16)	8585284		< 10	< 10	NA	< 10	100%	60%	130%	92%	80%	120%	78%	70%	130%
F3 (C16 to C34)	8585284		< 50	< 50	NA	< 50	109%	60%	130%	106%	80%	120%	89%	70%	130%
F4 (C34 to C50)	8585284		< 50	< 50	NA	< 50	94%	60%	130%	90%	80%	120%	71%	70%	130%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	8584664		< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	87%	50%	140%	90%	50%	140%
Vinyl Chloride	8584664		< 0.02	< 0.02	NA	< 0.02	94%	50%	140%	97%	50%	140%	77%	50%	140%
Bromomethane	8584664		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	81%	50%	140%	78%	50%	140%
Trichlorofluoromethane	8584664		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	82%	50%	140%	90%	50%	140%
Acetone	8584664		< 0.50	< 0.50	NA	< 0.50	98%	50%	140%	93%	50%	140%	92%	50%	140%
1,1-Dichloroethylene	8584664		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	95%	60%	130%	80%	50%	140%
Methylene Chloride	8584664		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	90%	60%	130%	84%	50%	140%
Trans- 1,2-Dichloroethylene	8584664		< 0.05	< 0.05	NA	< 0.05	78%	50%	140%	81%	60%	130%	95%	50%	140%
Methyl tert-butyl Ether	8584664		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	97%	60%	130%	84%	50%	140%
1,1-Dichloroethane	8584664		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	79%	60%	130%	83%	50%	140%
Methyl Ethyl Ketone	8584664		< 0.50	< 0.50	NA	< 0.50	88%	50%	140%	89%	50%	140%	92%	50%	140%
Cis- 1,2-Dichloroethylene	8584664		< 0.02	< 0.02	NA	< 0.02	99%	50%	140%	98%	60%	130%	98%	50%	140%
Chloroform	8584664		< 0.04	< 0.04	NA	< 0.04	88%	50%	140%	92%	60%	130%	96%	50%	140%
1,2-Dichloroethane	8584664		< 0.03	< 0.03	NA	< 0.03	90%	50%	140%	93%	60%	130%	92%	50%	140%
1,1,1-Trichloroethane	8584664		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	98%	60%	130%	82%	50%	140%
Carbon Tetrachloride	8584664		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	92%	60%	130%	85%	50%	140%
Benzene	8584664		< 0.02	< 0.02	NA	< 0.02	97%	50%	140%	98%	60%	130%	80%	50%	140%
1,2-Dichloropropane	8584664		< 0.03	< 0.03	NA	< 0.03	93%	50%	140%	97%	60%	130%	89%	50%	140%
Trichloroethylene	8584664		< 0.03	< 0.03	NA	< 0.03	92%	50%	140%	86%	60%	130%	86%	50%	140%
Bromodichloromethane	8584664		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	82%	60%	130%	92%	50%	140%
Methyl Isobutyl Ketone	8584664		< 0.50	< 0.50	NA	< 0.50	95%	50%	140%	98%	50%	140%	91%	50%	140%
1,1,2-Trichloroethane	8584664		< 0.04	< 0.04	NA	< 0.04	97%	50%	140%	83%	60%	130%	90%	50%	140%
Toluene	8584664		< 0.02	< 0.02	NA	< 0.02	96%	50%	140%	89%	60%	130%	81%	50%	140%
Dibromochloromethane	8584664		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	99%	60%	130%	91%	50%	140%
Ethylene Dibromide	8584664		< 0.04	< 0.04	NA	< 0.04	96%	50%	140%	84%	60%	130%	93%	50%	140%
Tetrachloroethylene	8584664		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	95%	60%	130%	93%	50%	140%
1,1,1,2-Tetrachloroethane	8584664		< 0.04	< 0.04	NA	< 0.04	96%	50%	140%	98%	60%	130%	85%	50%	140%
Chlorobenzene	8584664		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	90%	60%	130%	82%	50%	140%
Ethylbenzene	8584664		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	95%	60%	130%	89%	50%	140%
m & p-Xylene	8584664		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	75%	60%	130%	73%	50%	140%
Bromoform	8584664		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	84%	60%	130%	93%	50%	140%
Styrene	8584664		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	91%	60%	130%	89%	50%	140%
1,1,2,2-Tetrachloroethane	8584664		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	84%	60%	130%	91%	50%	140%
o-Xylene	8584664		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	81%	60%	130%	89%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

Trace Organics Analysis (Continued)

RPT Date: Jul 31, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	8584664		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	86%	60%	130%	85%	50%	140%
1,4-Dichlorobenzene	8584664		< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	98%	60%	130%	91%	50%	140%
1,2-Dichlorobenzene	8584664		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	91%	60%	130%	82%	50%	140%
1,3-Dichloropropene	8584664		< 0.04	< 0.04	NA	< 0.04	82%	50%	140%	84%	60%	130%	91%	50%	140%
n-Hexane	8584664		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	81%	60%	130%	85%	50%	140%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

O. Reg. 153(511) - PCBs (Soil)															
Aroclor 1242	8585284		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1248	8585284		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1254	8585284		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Aroclor 1260	8585284		< 0.1	< 0.1	NA	< 0.1	NA	60%	140%	NA	60%	140%	NA	60%	140%
Polychlorinated Biphenyls	8585284		< 0.1	< 0.1	NA	< 0.1	102%	60%	140%	108%	60%	140%	102%	60%	140%

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Aroclor 1242	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1248	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1254	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Aroclor 1260	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Polychlorinated Biphenyls	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P &T GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P & T GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	Balance
Moisture Content	VOL-91-5009	CCME Tier 1 Method, SW846 5035,8015	BALANCE
Terphenyl	VOL-91-5009	CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z240230

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:P.H.

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Moisture Content	VOL-91-5002	MOE E3139	BALANCE

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

inted

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 1732402 30

Cooler Quantity: no - on ice

Arrival Temperatures: 2.5 | 2.1 | 2.4
3 | 3.6 | 3.9

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: Golder Associates
Contact: Alex Wood
Address: 1931 Robertson Road, Ottawa Ontario
Phone: 613-408-4804 Fax:
Reports to be sent to:
1. Email: alex_wood@golder.ca
2. Email:

Project Information:

Project: 1783221
Site Location: Lincoln Fields
Sampled By: Paul Hulan
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☐ Ind/Com
☒ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on Certificate of Analysis ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Please Circle) Y / N	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ NO_3/NO_2 ☐ Total N ☐ Hg ☐ pH ☐ SAR	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3/NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use
17-6 (SA-4)	July 19/17		2	S									X	X				X			
17-6 (SA-7)	"		2	S									X	X							
17-23 (SA-2)	July 17/17		3	S									X	X				X			
17-23 (SA-4)	"		3	S									X	X				X			
17-23 (SA-14)	"		3	S									X	X				X			
17-24 (SA-1)	"		2	S									X	X							
~~17-24 (SA-3)~~	~~"~~			S																	
17-24 (SA-5)	"		2	S									X	X							
17-25 (SA-3)	July 18/17		2	S									X	X							
17-25 (SA-6)	"		2	S									X	X							

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Alex Wood Alwood	July 21/17	2:00pm	[illegible]	21-July-17	15h00
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
[illegible] to Fed Ex	21-July-17	16h30	[illegible]	17/7/22	10:13
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page ( ) of ( )

N°: T 033144

Document ID: Div 78 1511 011

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Keith Holmes

PROJECT: 1783221

AGAT WORK ORDER: 17Z292531

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Dec 14, 2017

PAGES (INCLUDING COVER): 17

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (780) 402-2050

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Excluding Hydrides) (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-08 SA1	17-101 SA1	17-108 SA3	17-108 SA7
		SAMPLE TYPE:		Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-11-28	2017-11-28	2017-11-29	2017-11-29
Parameter	Unit	G / S	RDL	8960894	8960913	8960938	8960953
Boron	µg/g		5	<5	<5	<5	<5
Barium	µg/g		2	32	29	58	76
Beryllium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g		2	9	8	23	17
Cobalt	µg/g		0.5	2.6	2.8	7.4	5.7
Copper	µg/g		1	4	6	11	13
Lead	µg/g		1	5	3	4	4
Molybdenum	µg/g		0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/g		1	4	5	12	13
Silver	µg/g		0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g		0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g		0.5	0.5	<0.5	0.8	<0.5
Vanadium	µg/g		1	16	13	25	24
Zinc	µg/g		5	16	10	23	27

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By: Amanjot Bhela

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

			SAMPLE DESCRIPTION:	17-08 SA4
			SAMPLE TYPE:	Soil
			DATE SAMPLED:	2017-11-28
Parameter	Unit	G / S	RDL	8960903
pH, 2:1 CaCl2 Extraction	pH Units		NA	7.73

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960903 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Amanjot Bhela

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

SAMPLE DESCRIPTION:				17-08 SA1	17-101 SA1	17-108 SA3	17-108 SA7
SAMPLE TYPE:				Soil	Soil	Soil	Soil
DATE SAMPLED:				2017-11-28	2017-11-28	2017-11-29	2017-11-29
Parameter	Unit	G / S	RDL	8960894	8960913	8960938	8960953
Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benz(a)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Chrysene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(b)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g		0.05	<0.05	<0.05	<0.05	<0.05
Moisture Content	%		0.1	15.2	5.4	15.3	11.2
Surrogate	Unit	Acceptable Limits					
Chrysene-d12	%	50-140		115	116	121	124

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960894-8960953 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

Certified By:

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PCBs (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-08 SA1	17-08 SA4
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-11-28	2017-11-28
Parameter	Unit	G / S	RDL	8960894	8960903
Polychlorinated Biphenyls	µg/g		0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits			
Decachlorobiphenyl	%	60-140		88	120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960894-8960903 Results are based on the dry weight of soil extracted.

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-08 SA4	17-101 SA4	17-101 SA44
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-11-28	2017-11-28	2017-11-28
Parameter	Unit	G / S	RDL	8960903	8960920	8960930
Benzene	µg/g		0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	<10	<10	<10
F3 (C16 to C34)	µg/g		50	<50	<50	<50
F4 (C34 to C50)	µg/g		50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA
Moisture Content	%		0.1	31.4	26.5	27.8
Surrogate	Unit	Acceptable Limits				
Terphenyl	%	60-140		90	125	130

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960903-8960930 Results are based on sample dry weight.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-108 SA7
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-11-29
Parameter	Unit	G / S	RDL	8960953
F1 (C6 to C10)	µg/g		5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5
F2 (C10 to C16)	µg/g		10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10
F3 (C16 to C34)	µg/g		50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50
F4 (C34 to C50)	µg/g		50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA
Moisture Content	%		0.1	11.2
Surrogate	Unit	Acceptable Limits		
Terphenyl	%	60-140		140

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960953 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-08 SA1	17-101 SA1	17-108 SA3
		SAMPLE TYPE:		Soil	Soil	Soil
		DATE SAMPLED:		2017-11-28	2017-11-28	2017-11-29
Parameter	Unit	G / S	RDL	8960894	8960913	8960938
Benzene	µg/g		0.02	<0.02	<0.02	<0.02
Toluene	µg/g		0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g		0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g		0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g		5	<5	<5	<5
F2 (C10 to C16)	µg/g		10	<10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10
F3 (C16 to C34)	µg/g		50	<50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50	<50
F4 (C34 to C50)	µg/g		50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g		50	NA	NA	NA
Moisture Content	%		0.1	15.2	5.4	15.3
Surrogate	Unit	Acceptable Limits				
Terphenyl	%	60-140		140	110	130

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960894-8960938 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-108 SA7
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-11-29
Parameter	Unit	G / S	RDL	8960953
Dichlorodifluoromethane	µg/g		0.05	<0.05
Vinyl Chloride	ug/g		0.02	<0.02
Bromomethane	ug/g		0.05	<0.05
Trichlorofluoromethane	ug/g		0.05	<0.05
Acetone	ug/g		0.50	<0.50
1,1-Dichloroethylene	ug/g		0.05	<0.05
Methylene Chloride	ug/g		0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g		0.05	<0.05
Methyl tert-butyl Ether	ug/g		0.05	<0.05
1,1-Dichloroethane	ug/g		0.02	<0.02
Methyl Ethyl Ketone	ug/g		0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g		0.02	<0.02
Chloroform	ug/g		0.04	<0.04
1,2-Dichloroethane	ug/g		0.03	<0.03
1,1,1-Trichloroethane	ug/g		0.05	<0.05
Carbon Tetrachloride	ug/g		0.05	<0.05
Benzene	ug/g		0.02	<0.02
1,2-Dichloropropane	ug/g		0.03	<0.03
Trichloroethylene	ug/g		0.03	<0.03
Bromodichloromethane	ug/g		0.05	<0.05
Methyl Isobutyl Ketone	ug/g		0.50	<0.50
1,1,2-Trichloroethane	ug/g		0.04	<0.04
Toluene	ug/g		0.02	<0.02
Dibromochloromethane	ug/g		0.05	<0.05
Ethylene Dibromide	ug/g		0.04	<0.04
Tetrachloroethylene	ug/g		0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g		0.04	<0.04
Chlorobenzene	ug/g		0.05	<0.05
Ethylbenzene	ug/g		0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-12-06

DATE REPORTED: 2017-12-14

		SAMPLE DESCRIPTION:		17-108 SA7
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-11-29
Parameter	Unit	G / S	RDL	8960953
Bromoform	ug/g		0.05	<0.05
Styrene	ug/g		0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g		0.05	<0.05
o-Xylene	ug/g		0.05	<0.05
1,3-Dichlorobenzene	ug/g		0.05	<0.05
1,4-Dichlorobenzene	ug/g		0.05	<0.05
1,2-Dichlorobenzene	ug/g		0.05	<0.05
Xylene Mixture	ug/g		0.05	<0.05
1,3-Dichloropropene	µg/g		0.04	<0.04
n-Hexane	µg/g		0.05	<0.05
Surrogate	Unit	Acceptable Limits		
Toluene-d8	% Recovery	50-140		96
4-Bromofluorobenzene	% Recovery	50-140		84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

8960953 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Dec 14, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Excluding Hydrides) (Soil)															
Boron	8956479		16	16	NA	< 5	82%	70%	130%	99%	80%	120%	75%	70%	130%
Barium	8956479		141	114	21.2%	< 2	98%	70%	130%	100%	80%	120%	88%	70%	130%
Beryllium	8956479		0.8	0.9	NA	< 0.5	91%	70%	130%	102%	80%	120%	104%	70%	130%
Cadmium	8956479		<0.5	<0.5	NA	< 0.5	113%	70%	130%	101%	80%	120%	98%	70%	130%
Chromium	8956479		23	23	0.0%	< 2	86%	70%	130%	102%	80%	120%	112%	70%	130%
Cobalt	8956479		12.3	13.1	6.3%	< 0.5	87%	70%	130%	103%	80%	120%	92%	70%	130%
Copper	8956479		14	14	0.0%	< 1	83%	70%	130%	98%	80%	120%	95%	70%	130%
Lead	8956479		10	10	0.0%	< 1	106%	70%	130%	105%	80%	120%	101%	70%	130%
Molybdenum	8956479		1.0	0.9	NA	< 0.5	98%	70%	130%	103%	80%	120%	88%	70%	130%
Nickel	8956479		29	29	0.0%	< 1	93%	70%	130%	105%	80%	120%	90%	70%	130%
Silver	8956479		<0.2	<0.2	NA	< 0.2	94%	70%	130%	108%	80%	120%	109%	70%	130%
Thallium	8956479		<0.4	<0.4	NA	< 0.4	103%	70%	130%	106%	80%	120%	108%	70%	130%
Uranium	8956479		1.0	1.1	NA	< 0.5	112%	70%	130%	114%	80%	120%	118%	70%	130%
Vanadium	8956479		30	29	3.4%	< 1	92%	70%	130%	103%	80%	120%	87%	70%	130%
Zinc	8956479		52	58	10.9%	< 5	85%	70%	130%	101%	80%	120%	92%	70%	130%
O. Reg. 153(511) - ORPs (Soil)															
pH, 2:1 CaCl2 Extraction	8967659		7.65	7.71	0.8%	NA	101%	90%	110%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL

Certified By: Amanjot Bhela

AGAT Laboratories
10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 17Z292531
PROJECT: 1783221
ATTENTION TO: Keith Holmes
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Dec 14, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	8961873		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	85%	50%	140%	83%	50%	140%
Vinyl Chloride	8961873		< 0.02	< 0.02	NA	< 0.02	87%	50%	140%	127%	50%	140%	115%	50%	140%
Bromomethane	8961873		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	123%	50%	140%	121%	50%	140%
Trichlorofluoromethane	8961873		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	111%	50%	140%	122%	50%	140%
Acetone	8961873		< 0.50	< 0.50	NA	< 0.50	95%	50%	140%	103%	50%	140%	98%	50%	140%
1,1-Dichloroethylene	8961873		< 0.05	< 0.05	NA	< 0.05	71%	50%	140%	83%	60%	130%	74%	50%	140%
Methylene Chloride	8961873		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	74%	60%	130%	112%	50%	140%
Trans- 1,2-Dichloroethylene	8961873		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	112%	60%	130%	97%	50%	140%
Methyl tert-butyl Ether	8961873		< 0.05	< 0.05	NA	< 0.05	119%	50%	140%	80%	60%	130%	70%	50%	140%
1,1-Dichloroethane	8961873		< 0.02	< 0.02	NA	< 0.02	112%	50%	140%	112%	60%	130%	95%	50%	140%
Methyl Ethyl Ketone	8961873		< 0.50	< 0.50	NA	< 0.50	114%	50%	140%	96%	50%	140%	100%	50%	140%
Cis- 1,2-Dichloroethylene	8961873		< 0.02	< 0.02	NA	< 0.02	88%	50%	140%	95%	60%	130%	98%	50%	140%
Chloroform	8961873		< 0.04	< 0.04	NA	< 0.04	113%	50%	140%	117%	60%	130%	109%	50%	140%
1,2-Dichloroethane	8961873		< 0.03	< 0.03	NA	< 0.03	105%	50%	140%	112%	60%	130%	111%	50%	140%
1,1,1-Trichloroethane	8961873		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	100%	60%	130%	106%	50%	140%
Carbon Tetrachloride	8961873		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	104%	60%	130%	106%	50%	140%
Benzene	8961873		< 0.02	< 0.02	NA	< 0.02	80%	50%	140%	103%	60%	130%	88%	50%	140%
1,2-Dichloropropane	8961873		< 0.03	< 0.03	NA	< 0.03	102%	50%	140%	110%	60%	130%	99%	50%	140%
Trichloroethylene	8961873		< 0.03	< 0.03	NA	< 0.03	82%	50%	140%	105%	60%	130%	87%	50%	140%
Bromodichloromethane	8961873		< 0.05	< 0.05	NA	< 0.05	118%	50%	140%	114%	60%	130%	107%	50%	140%
Methyl Isobutyl Ketone	8961873		< 0.50	< 0.50	NA	< 0.50	99%	50%	140%	93%	50%	140%	94%	50%	140%
1,1,2-Trichloroethane	8961873		< 0.04	< 0.04	NA	< 0.04	94%	50%	140%	101%	60%	130%	113%	50%	140%
Toluene	8961873		< 0.05	< 0.05	NA	< 0.02	99%	50%	140%	96%	60%	130%	98%	50%	140%
Dibromochloromethane	8961873		< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	98%	60%	130%	106%	50%	140%
Ethylene Dibromide	8961873		< 0.04	< 0.04	NA	< 0.04	119%	50%	140%	97%	60%	130%	105%	50%	140%
Tetrachloroethylene	8961873		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	106%	60%	130%	99%	50%	140%
1,1,1,2-Tetrachloroethane	8961873		< 0.04	< 0.04	NA	< 0.04	72%	50%	140%	101%	60%	130%	104%	50%	140%
Chlorobenzene	8961873		< 0.05	< 0.05	NA	< 0.05	116%	50%	140%	96%	60%	130%	100%	50%	140%
Ethylbenzene	8961873		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	93%	60%	130%	90%	50%	140%
m & p-Xylene	8961873		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	97%	60%	130%	100%	50%	140%
Bromoform	8961873		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	98%	60%	130%	108%	50%	140%
Styrene	8961873		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	78%	60%	130%	79%	50%	140%
1,1,2,2-Tetrachloroethane	8961873		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	99%	60%	130%	91%	50%	140%
o-Xylene	8961873		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	102%	60%	130%	107%	50%	140%
1,3-Dichlorobenzene	8961873		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	85%	60%	130%	87%	50%	140%
1,4-Dichlorobenzene	8961873		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	95%	60%	130%	104%	50%	140%
1,2-Dichlorobenzene	8961873		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	89%	60%	130%	95%	50%	140%
1,3-Dichloropropene	8961873		< 0.04	< 0.04	NA	< 0.04	115%	50%	140%	97%	60%	130%	86%	50%	140%
n-Hexane	8961873		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	97%	60%	130%	87%	50%	140%

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Dec 14, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).															
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	8959499		< 0.02	< 0.02	NA	< 0.02	94%	60%	130%	77%	60%	130%	95%	60%	130%
Toluene	8959499		< 0.08	< 0.08	NA	< 0.08	102%	60%	130%	87%	60%	130%	106%	60%	130%
Ethylbenzene	8959499		< 0.05	< 0.05	NA	< 0.05	98%	60%	130%	86%	60%	130%	106%	60%	130%
Xylene Mixture	8959499		< 0.05	< 0.05	NA	< 0.05	99%	60%	130%	89%	60%	130%	107%	60%	130%
F1 (C6 to C10)	8959499		< 5	< 5	NA	< 5	86%	60%	130%	87%	85%	115%	78%	70%	130%
F2 (C10 to C16)	8954793		< 10	< 10	NA	< 10	107%	60%	130%	100%	80%	120%	100%	70%	130%
F3 (C16 to C34)	8954793		< 50	< 50	NA	< 50	109%	60%	130%	93%	80%	120%	104%	70%	130%
F4 (C34 to C50)	8954793		< 50	< 50	NA	< 50	101%	60%	130%	99%	80%	120%	86%	70%	130%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	126%	50%	140%	80%	50%	140%	79%	50%	140%
Acenaphthylene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	83%	50%	140%	84%	50%	140%
Acenaphthene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	85%	50%	140%	79%	50%	140%
Fluorene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	112%	50%	140%	90%	50%	140%	87%	50%	140%
Phenanthrene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	86%	50%	140%	86%	50%	140%
Anthracene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	110%	50%	140%	88%	50%	140%	87%	50%	140%
Fluoranthene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	130%	50%	140%	97%	50%	140%	102%	50%	140%
Pyrene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	124%	50%	140%	94%	50%	140%	102%	50%	140%
Benz(a)anthracene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	129%	50%	140%	98%	50%	140%	101%	50%	140%
Chrysene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	124%	50%	140%	102%	50%	140%	107%	50%	140%
Benzo(b)fluoranthene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	132%	50%	140%	123%	50%	140%	102%	50%	140%
Benzo(k)fluoranthene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	117%	50%	140%	116%	50%	140%	101%	50%	140%
Benzo(a)pyrene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	89%	50%	140%	82%	50%	140%
Indeno(1,2,3-cd)pyrene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	67%	50%	140%	63%	50%	140%
Dibenz(a,h)anthracene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	63%	50%	140%	76%	50%	140%
Benzo(g,h,i)perylene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	77%	50%	140%	70%	50%	140%
2-and 1-methyl Naphthalene	8960913	8960913	< 0.05	< 0.05	NA	< 0.05	110%	50%	140%	89%	50%	140%	86%	50%	140%
O. Reg. 153(511) - PCBs (Soil)															
Polychlorinated Biphenyls	8956367		< 0.1	< 0.1	NA	< 0.1	102%	60%	140%	105%	60%	140%	88%	60%	140%

Certified By: N Popowich

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	pH METER

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Moisture Content	ORG-91-5106	EPA SW-846 3541 & 8270	BALANCE
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Polychlorinated Biphenyls	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541 & 8082	GC/ECD
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

10203B 123 STREET
GRANDE PRAIRIE, ALBERTA
CANADA T8V 8B7
TEL (780)402-2050
FAX (780)402-2078
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z292531

PROJECT: 1783221

ATTENTION TO: Keith Holmes

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

1L9

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 172292531

Cooler Quantity: one on ice

Arrival Temperatures: 8.9 | 9.0 | 9.1
7.6 | 8 | 8.1

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes:

Report Information:

Company: Golder
Contact: Keith Holmes
Address:

Phone: Fax:

Reports to be sent to:
1. Email: kholmes@golder.com
2. Email: awood@golder.com

Project Information:

Project: 1783221
Site Location: LF
Sampled By:
AGAT Quote #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table (Indicate One): ☒ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One): ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One): ☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals (excl. Hydrides) ☐ Hydride Metals (incl. Hydrides) ☐ 153 Metals)	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☒ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	pH	BTEX
17-08 SA1	28/11/17	12:00	3	S			X						X	X	X					X
17-08 SA4	↓	↓	↓	↓									X		X				X	X
17-101 SA1							X						X	X						X
17-101 SA4													X							X
17-101 SA44													X							X
17-108 SA3	29/11/17						X						X	X						X
17-108 SA7	11	↓	2	↓	If low little volume drop PAHs		X					X	X	X						

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Keith Holmes	6/12/17	10:00	Uberlei Leti	6-Dec-17	12h00
UBTM to FedEx	6-Dec-17	16h00	Suma Z	17/12/7	8 89

Page ____ of ____

N°: T 063223

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1783221

AGAT WORK ORDER: 17Z241763

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Aug 04, 2017

PAGES (INCLUDING COVER): 13

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals & Inorganics (Soil)

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		17-19 (SA1)
		SAMPLE TYPE:		Soil
		DATE SAMPLED:		2017-07-21
Parameter	Unit	G / S	RDL	8602588
Antimony	µg/g	7.5	0.8	<0.8
Arsenic	µg/g	18	1	3
Barium	µg/g	390	2	169
Beryllium	µg/g	4	0.5	<0.5
Boron	µg/g	120	5	13
Boron (Hot Water Soluble)	µg/g	1.5	0.10	1.07
Cadmium	µg/g	1.2	0.5	<0.5
Chromium	µg/g	160	2	10
Cobalt	µg/g	22	0.5	7.4
Copper	µg/g	140	1	12
Lead	µg/g	120	1	12
Molybdenum	µg/g	6.9	0.5	1.1
Nickel	µg/g	100	1	15
Selenium	µg/g	2.4	0.4	<0.4
Silver	µg/g	20	0.2	<0.2
Thallium	µg/g	1	0.4	<0.4
Uranium	µg/g	23	0.5	<0.5
Vanadium	µg/g	86	1	19
Zinc	µg/g	340	5	16
Chromium VI	µg/g	8	0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040
Mercury	µg/g	0.27	0.10	<0.10
Electrical Conductivity	mS/cm	0.7	0.005	0.508
Sodium Adsorption Ratio	NA	5	NA	10.8
pH, 2:1 CaCl2 Extraction	pH Units		NA	8.15

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8602588 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		17-19 (SA1)	17-19 (SA4)
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8602588	8602594
F1 (C6 to C10)	µg/g	55	5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10
F3 (C16 to C34)	µg/g	300	50	150	<50
F4 (C34 to C50)	µg/g	2800	50	170	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA
Moisture Content	%		0.1	2.8	19.8
Surrogate	Unit	Acceptable Limits			
Terphenyl	%	60-140		83	119

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8602588-8602594 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		17-19 (SA1)	17-19 (SA4)
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8602588	8602594
Dichlorodifluoromethane	µg/g	16	0.05	<0.05	<0.05
Vinyl Chloride	ug/g	0.02	0.02	<0.02	<0.02
Bromomethane	ug/g	0.05	0.05	<0.05	<0.05
Trichlorofluoromethane	ug/g	4	0.05	<0.05	<0.05
Acetone	ug/g	16	0.50	<0.50	<0.50
1,1-Dichloroethylene	ug/g	0.05	0.05	<0.05	<0.05
Methylene Chloride	ug/g	0.1	0.05	<0.05	<0.05
Trans- 1,2-Dichloroethylene	ug/g	0.084	0.05	<0.05	<0.05
Methyl tert-butyl Ether	ug/g	0.75	0.05	<0.05	<0.05
1,1-Dichloroethane	ug/g	0.47	0.02	<0.02	<0.02
Methyl Ethyl Ketone	ug/g	16	0.50	<0.50	<0.50
Cis- 1,2-Dichloroethylene	ug/g	1.9	0.02	<0.02	<0.02
Chloroform	ug/g	0.05	0.04	<0.04	<0.04
1,2-Dichloroethane	ug/g	0.05	0.03	<0.03	<0.03
1,1,1-Trichloroethane	ug/g	0.38	0.05	<0.05	<0.05
Carbon Tetrachloride	ug/g	0.05	0.05	<0.05	<0.05
Benzene	ug/g	0.21	0.02	<0.02	<0.02
1,2-Dichloropropane	ug/g	0.05	0.03	<0.03	<0.03
Trichloroethylene	ug/g	0.061	0.03	<0.03	<0.03
Bromodichloromethane	ug/g	1.5	0.05	<0.05	<0.05
Methyl Isobutyl Ketone	ug/g	1.7	0.50	<0.50	<0.50
1,1,2-Trichloroethane	ug/g	0.05	0.04	<0.04	<0.04
Toluene	ug/g	2.3	0.02	<0.02	<0.02
Dibromochloromethane	ug/g	2.3	0.05	<0.05	<0.05
Ethylene Dibromide	ug/g	0.05	0.04	<0.04	<0.04
Tetrachloroethylene	ug/g	0.28	0.05	<0.05	<0.05
1,1,1,2-Tetrachloroethane	ug/g	0.058	0.04	<0.04	<0.04
Chlorobenzene	ug/g	2.4	0.05	<0.05	<0.05
Ethylbenzene	ug/g	1.1	0.05	<0.05	<0.05
m & p-Xylene	ug/g		0.05	<0.05	<0.05

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2017-07-26

DATE REPORTED: 2017-08-04

		SAMPLE DESCRIPTION:		17-19 (SA1)	17-19 (SA4)
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-07-21	2017-07-21
Parameter	Unit	G / S	RDL	8602588	8602594
Bromoform	ug/g	0.27	0.05	<0.05	<0.05
Styrene	ug/g	0.7	0.05	<0.05	<0.05
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	<0.05	<0.05
o-Xylene	ug/g		0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	4.8	0.05	<0.05	<0.05
1,4-Dichlorobenzene	ug/g	0.083	0.05	<0.05	<0.05
1,2-Dichlorobenzene	ug/g	1.2	0.05	<0.05	<0.05
Xylene Mixture	ug/g	3.1	0.05	<0.05	<0.05
1,3-Dichloropropene	µg/g	0.05	0.04	<0.04	<0.04
n-Hexane	µg/g	2.8	0.05	<0.05	<0.05
Surrogate	Unit	Acceptable Limits			
Toluene-d8	% Recovery	50-140		83	83
4-Bromofluorobenzene	% Recovery	50-140		94	97

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8602588-8602594 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By: 

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8602588	17-19 (SA1)	ON T2 S RPI CT	O. Reg. 153(511) - Metals & Inorganics (Soil)	Sodium Adsorption Ratio	NA	5	10.8

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	8607606		<0.8	<0.8	NA	< 0.8	118%	70%	130%	101%	80%	120%	84%	70%	130%
Arsenic	8607606		2	2	NA	< 1	101%	70%	130%	99%	80%	120%	99%	70%	130%
Barium	8607606		35	39	10.8%	< 2	108%	70%	130%	112%	80%	120%	106%	70%	130%
Beryllium	8607606		<0.5	<0.5	NA	< 0.5	101%	70%	130%	105%	80%	120%	103%	70%	130%
Boron	8607606		<5	<5	NA	< 5	99%	70%	130%	100%	80%	120%	103%	70%	130%
Boron (Hot Water Soluble)	8603244		0.16	0.16	NA	< 0.10	110%	60%	140%	103%	70%	130%	88%	60%	140%
Cadmium	8607606		<0.5	<0.5	NA	< 0.5	93%	70%	130%	102%	80%	120%	105%	70%	130%
Chromium	8607606		11	11	0.0%	< 2	101%	70%	130%	110%	80%	120%	112%	70%	130%
Cobalt	8607606		4.0	3.9	2.5%	< 0.5	104%	70%	130%	107%	80%	120%	109%	70%	130%
Copper	8607606		23	23	0.0%	< 1	102%	70%	130%	108%	80%	120%	112%	70%	130%
Lead	8607606		38	40	5.1%	< 1	105%	70%	130%	109%	80%	120%	116%	70%	130%
Molybdenum	8607606		0.6	0.6	NA	< 0.5	114%	70%	130%	106%	80%	120%	114%	70%	130%
Nickel	8607606		9	9	0.0%	< 1	104%	70%	130%	109%	80%	120%	111%	70%	130%
Selenium	8607606		1.4	0.9	NA	< 0.4	106%	70%	130%	104%	80%	120%	113%	70%	130%
Silver	8607606		<0.2	<0.2	NA	< 0.2	103%	70%	130%	103%	80%	120%	98%	70%	130%
Thallium	8607606		<0.4	<0.4	NA	< 0.4	118%	70%	130%	102%	80%	120%	103%	70%	130%
Uranium	8607606		<0.5	<0.5	NA	< 0.5	109%	70%	130%	110%	80%	120%	107%	70%	130%
Vanadium	8607606		18	17	5.7%	< 1	106%	70%	130%	107%	80%	120%	108%	70%	130%
Zinc	8607606		70	69	1.4%	< 5	102%	70%	130%	106%	80%	120%	108%	70%	130%
Chromium VI	8602502		<0.2	<0.2	NA	< 0.2	101%	70%	130%	102%	80%	120%	102%	70%	130%
Cyanide	8601948		<0.040	<0.040	NA	< 0.040	92%	70%	130%	100%	80%	120%	92%	70%	130%
Mercury	8607606		0.1	0.1	NA	< 0.10	114%	70%	130%	106%	80%	120%	81%	70%	130%
Electrical Conductivity	8603244		0.166	0.165	0.6%	< 0.005	97%	90%	110%	NA			NA		
Sodium Adsorption Ratio	8603244		0.320	0.325	1.6%	NA	NA			NA			NA		
pH, 2:1 CaCl2 Extraction	8604030		7.72	7.77	0.6%	NA	101%	80%	120%	NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 17Z241763
PROJECT: 1783221
ATTENTION TO: Alex Wood
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Aug 04, 2017

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	8600328		< 0.05	< 0.05	NA	< 0.05	92%	50%	140%	94%	50%	140%	86%	50%	140%
Vinyl Chloride	8600328		< 0.02	< 0.02	NA	< 0.02	98%	50%	140%	88%	50%	140%	95%	50%	140%
Bromomethane	8600328		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	92%	50%	140%	99%	50%	140%
Trichlorofluoromethane	8600328		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	85%	50%	140%	80%	50%	140%
Acetone	8600328		< 0.50	< 0.50	NA	< 0.50	82%	50%	140%	94%	50%	140%	82%	50%	140%
1,1-Dichloroethylene	8600328		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	98%	60%	130%	86%	50%	140%
Methylene Chloride	8600328		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	95%	60%	130%	89%	50%	140%
Trans- 1,2-Dichloroethylene	8600328		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	94%	60%	130%	82%	50%	140%
Methyl tert-butyl Ether	8600328		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	91%	60%	130%	81%	50%	140%
1,1-Dichloroethane	8600328		< 0.02	< 0.02	NA	< 0.02	87%	50%	140%	90%	60%	130%	89%	50%	140%
Methyl Ethyl Ketone	8600328		< 0.50	< 0.50	NA	< 0.50	93%	50%	140%	84%	50%	140%	93%	50%	140%
Cis- 1,2-Dichloroethylene	8600328		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	82%	60%	130%	91%	50%	140%
Chloroform	8600328		< 0.04	< 0.04	NA	< 0.04	115%	50%	140%	85%	60%	130%	98%	50%	140%
1,2-Dichloroethane	8600328		< 0.03	< 0.03	NA	< 0.03	91%	50%	140%	89%	60%	130%	95%	50%	140%
1,1,1-Trichloroethane	8600328		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	90%	60%	130%	91%	50%	140%
Carbon Tetrachloride	8600328		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	89%	60%	130%	95%	50%	140%
Benzene	8600328		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	83%	60%	130%	99%	50%	140%
1,2-Dichloropropane	8600328		< 0.03	< 0.03	NA	< 0.03	95%	50%	140%	89%	60%	130%	90%	50%	140%
Trichloroethylene	8600328		< 0.03	< 0.03	NA	< 0.03	86%	50%	140%	81%	60%	130%	87%	50%	140%
Bromodichloromethane	8600328		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	90%	60%	130%	88%	50%	140%
Methyl Isobutyl Ketone	8600328		< 0.50	< 0.50	NA	< 0.50	88%	50%	140%	96%	50%	140%	88%	50%	140%
1,1,2-Trichloroethane	8600328		< 0.04	< 0.04	NA	< 0.04	92%	50%	140%	96%	60%	130%	87%	50%	140%
Toluene	8600328		< 0.02	< 0.02	NA	< 0.02	97%	50%	140%	90%	60%	130%	85%	50%	140%
Dibromochloromethane	8600328		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	82%	60%	130%	88%	50%	140%
Ethylene Dibromide	8600328		< 0.04	< 0.04	NA	< 0.04	90%	50%	140%	93%	60%	130%	90%	50%	140%
Tetrachloroethylene	8600328		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	81%	60%	130%	96%	50%	140%
1,1,1,2-Tetrachloroethane	8600328		< 0.04	< 0.04	NA	< 0.04	85%	50%	140%	95%	60%	130%	83%	50%	140%
Chlorobenzene	8600328		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	87%	60%	130%	96%	50%	140%
Ethylbenzene	8600328		< 0.05	< 0.05	NA	< 0.05	86%	50%	140%	81%	60%	130%	89%	50%	140%
m & p-Xylene	8600328		< 0.05	< 0.05	NA	< 0.05	74%	50%	140%	72%	60%	130%	77%	50%	140%
Bromoform	8600328		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	97%	60%	130%	95%	50%	140%
Styrene	8600328		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	99%	60%	130%	90%	50%	140%
1,1,2,2-Tetrachloroethane	8600328		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	94%	60%	130%	89%	50%	140%
o-Xylene	8600328		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	96%	60%	130%	89%	50%	140%
1,3-Dichlorobenzene	8600328		< 0.05	< 0.05	NA	< 0.05	91%	50%	140%	80%	60%	130%	80%	50%	140%
1,4-Dichlorobenzene	8600328		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	89%	60%	130%	84%	50%	140%
1,2-Dichlorobenzene	8600328		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	85%	60%	130%	96%	50%	140%
1,3-Dichloropropene	8600328		< 0.04	< 0.04	NA	< 0.04	95%	50%	140%	96%	60%	130%	93%	50%	140%
n-Hexane	8600328		< 0.05	< 0.05	NA	< 0.05	85%	50%	140%	80%	60%	130%	96%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Aug 04, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)															
F1 (C6 to C10)	8591491		< 5	< 5	NA	< 5	74%	60%	130%	87%	85%	115%	81%	70%	130%
F2 (C10 to C16)	8600186		< 10	< 10	NA	< 10	109%	60%	130%	84%	80%	120%	78%	70%	130%
F3 (C16 to C34)	8600186		< 50	< 50	NA	< 50	108%	60%	130%	82%	80%	120%	83%	70%	130%
F4 (C34 to C50)	8600186		< 50	< 50	NA	< 50	100%	60%	130%	83%	80%	120%	103%	70%	130%

Comments: When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron (Hot Water Soluble)	MET-93-6104	EPA SW 846 6010C; MSA, Part 3, Ch.21	ICP/OES
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium VI	INOR-93-6029	SM 3500 B; MSA Part 3, Ch. 25	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE CN-3015 & E 3009 A;SM 4500 CN	TECHNICON AUTO ANALYZER
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Electrical Conductivity	INOR-93-6036	McKeague 4.12, SM 2510 B	EC METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010B	ICP/OES
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	PH METER

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P &T GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P & T GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	Balance
Moisture Content	VOL-91-5009	CCME Tier 1 Method, SW846 5035,8015	BALANCE
Terphenyl	VOL-91-5009	CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z241763

PROJECT: 1783221

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories
5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only
Work Order #: 17t24763
Cooler Quantity: one on ice
Arrival Temperatures: 4.0 | 4.1 | 4.0 / 7.6 | 7.1 | 7.3
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes:

Report Information:
Company: Golder Associates
Contact: Alex Wood
Address: 1931 Robertson Road, Ottawa, Ontario
Phone: 613-798-4804 Fax:
Reports to be sent to:
1. Email: alex_wood@golder.com
2. Email:

Project Information:
Project: 1783221
Site Location: Lincoln Fields
Sampled By: Paul Hulan
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information: Bill To Same: Yes ☒ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements: ☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 2 (Indicate One)
☐ Ind/Comm ☒ Res/Park ☐ Agriculture
Soil Texture (Check One): ☒ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other (Indicate One)

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ 1 Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

Sample Matrix Legend
B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Please Circle) Y / N	Metals and Inorganics	Metal Scan	Hydride Forming Metals	Client Custom Metals	ORPs: ☐B-HWS ☐Cl ☐CN ☐Cr6+ ☐EC ☐FOC ☐NO3/NO2 ☐Total N ☐Hg ☒pH ☒SAR	Nutrients: ☐TP ☐NH3 ☐TKN ☐NO3 ☐NO2 ☐NO3/NO2	Volatiles: ☒VOC ☐BTEX ☐THM	CCME Fractions 1 to 4	ABNs	PAHs	Chlorophenols	PCBs	Organochlorine Pesticides	TCLP Metals/Inorganics	Sewer Use
17-19 (SA1)	July 21/17		3	S			X				X		X	X							
17-19 (SA4)	"		2	S									X	X							

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Alex Wood A.Wood	July 25/17	13:00	(Bethelet Hallell	25-July-17	16h00
Samples Relinquished By (Print Name and Sign): UPS to FedEx	26-July-17	16h00	Samples Received By (Print Name and Sign): Sina	17/7/27	9h44
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time

Page 1 of 1
No: T 033145

Document ID: DIV-78-1511-011

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z314192

TRACE ORGANICS REVIEWED BY: Gyulhan Yalamova, Report Reviewer

DATE REPORTED: Feb 28, 2018

PAGES (INCLUDING COVER): 9

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-02-28

					SAMPLE DESCRIPTION:	17-21 SA2	17-21 SA5
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-22	2018-02-22
Parameter	Unit	G / S: A	G / S: B	RDL		9087115	9087117
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	<50[<B]
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	<50[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]
Moisture Content	%			0.1		6.4	9.3
Surrogate	Unit	Acceptable Limits					
Terphenyl	%	60-140				89	94

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9087115-9087117 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-02-28

					SAMPLE DESCRIPTION:	17-21 SA2	17-21 SA5
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-22	2018-02-22
Parameter	Unit	G / S: A	G / S: B	RDL		9087115	9087117
Dichlorodifluoromethane	µg/g	16	16	0.05		<0.05[<A]	<0.05[<A]
Vinyl Chloride	ug/g	0.032	0.02	0.02		<0.02[<B]	<0.02[<B]
Bromomethane	ug/g	0.05	0.05	0.05		<0.05[<A]	<0.05[<A]
Trichlorofluoromethane	ug/g	4	4	0.05		<0.05[<A]	<0.05[<A]
Acetone	ug/g	16	16	0.50		<0.50[<A]	<0.50[<A]
1,1-Dichloroethylene	ug/g	0.064	0.05	0.05		<0.05[<B]	<0.05[<B]
Methylene Chloride	ug/g	1.6	0.1	0.05		<0.05[<B]	<0.05[<B]
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.084	0.05		<0.05[<B]	<0.05[<B]
Methyl tert-butyl Ether	ug/g	11	0.75	0.05		<0.05[<B]	<0.05[<B]
1,1-Dichloroethane	ug/g	17	3.5	0.02		<0.02[<B]	<0.02[<B]
Methyl Ethyl Ketone	ug/g	70	16	0.50		<0.50[<B]	<0.50[<B]
Cis- 1,2-Dichloroethylene	ug/g	55	3.4	0.02		<0.02[<B]	<0.02[<B]
Chloroform	ug/g	0.47	0.05	0.04		<0.04[<B]	<0.04[<B]
1,2-Dichloroethane	ug/g	0.05	0.05	0.03		<0.03[<A]	<0.03[<A]
1,1,1-Trichloroethane	ug/g	6.1	0.38	0.05		<0.05[<B]	<0.05[<B]
Carbon Tetrachloride	ug/g	0.21	0.05	0.05		<0.05[<B]	<0.05[<B]
Benzene	ug/g	0.32	0.21	0.02		<0.02[<B]	<0.02[<B]
1,2-Dichloropropane	ug/g	0.16	0.05	0.03		<0.03[<B]	<0.03[<B]
Trichloroethylene	ug/g	0.91	0.061	0.03		<0.03[<B]	<0.03[<B]
Bromodichloromethane	ug/g	18	13	0.05		<0.05[<B]	<0.05[<B]
Methyl Isobutyl Ketone	ug/g	31	1.7	0.50		<0.50[<B]	<0.50[<B]
1,1,2-Trichloroethane	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]
Toluene	ug/g	68	2.3	0.02		<0.02[<B]	<0.02[<B]
Dibromochloromethane	ug/g	13	9.4	0.05		<0.05[<B]	<0.05[<B]
Ethylene Dibromide	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]
Tetrachloroethylene	ug/g	4.5	0.28	0.05		<0.05[<B]	<0.05[<B]
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.058	0.04		<0.04[<B]	<0.04[<B]
Chlorobenzene	ug/g	2.4	2.4	0.05		<0.05[<A]	<0.05[<A]
Ethylbenzene	ug/g	9.5	2	0.05		<0.05[<B]	<0.05[<B]
m & p-Xylene	ug/g			0.05		<0.05	<0.05

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-02-28

					SAMPLE DESCRIPTION:	17-21 SA2	17-21 SA5
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-22	2018-02-22
Parameter	Unit	G / S: A	G / S: B	RDL		9087115	9087117
Bromoform	ug/g	0.61	0.27	0.05		<0.05[<B]	<0.05[<B]
Styrene	ug/g	34	0.7	0.05		<0.05[<B]	<0.05[<B]
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	0.05		<0.05[<A]	<0.05[<A]
o-Xylene	ug/g			0.05		<0.05	<0.05
1,3-Dichlorobenzene	ug/g	9.6	4.8	0.05		<0.05[<B]	<0.05[<B]
1,4-Dichlorobenzene	ug/g	0.2	0.083	0.05		<0.05[<B]	<0.05[<B]
1,2-Dichlorobenzene	ug/g	6.8	3.4	0.05		<0.05[<B]	<0.05[<B]
Xylene Mixture	ug/g	26	3.1	0.05		<0.05[<B]	<0.05[<B]
1,3-Dichloropropene	µg/g	0.18	0.05	0.04		<0.04[<B]	<0.04[<B]
n-Hexane	µg/g	46	2.8	0.05		<0.05[<B]	<0.05[<B]
Surrogate	Unit		Acceptable Limits				
Toluene-d8	% Recovery		50-140			95	99
4-Bromofluorobenzene	% Recovery		50-140			79	78

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9087115-9087117 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z314192
PROJECT: 1780158
ATTENTION TO: Alex Wood
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Feb 28, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	115%	50%	140%	94%	50%	140%
Vinyl Chloride	9086386		< 0.02	< 0.02	NA	< 0.02	101%	50%	140%	113%	50%	140%	80%	50%	140%
Bromomethane	9086386		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	113%	50%	140%	86%	50%	140%
Trichlorofluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	119%	50%	140%	82%	50%	140%
Acetone	9086386		< 0.50	< 0.50	NA	< 0.50	100%	50%	140%	108%	50%	140%	98%	50%	140%
1,1-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	102%	60%	130%	88%	50%	140%
Methylene Chloride	9086386		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	98%	60%	130%	85%	50%	140%
Trans- 1,2-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	73%	50%	140%	98%	60%	130%	78%	50%	140%
Methyl tert-butyl Ether	9086386		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	95%	60%	130%	75%	50%	140%
1,1-Dichloroethane	9086386		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	95%	60%	130%	95%	50%	140%
Methyl Ethyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	87%	50%	140%	99%	50%	140%	81%	50%	140%
Cis- 1,2-Dichloroethylene	9086386		< 0.02	< 0.02	NA	< 0.02	77%	50%	140%	106%	60%	130%	84%	50%	140%
Chloroform	9086386		< 0.04	< 0.04	NA	< 0.04	85%	50%	140%	102%	60%	130%	97%	50%	140%
1,2-Dichloroethane	9086386		< 0.03	< 0.03	NA	< 0.03	87%	50%	140%	100%	60%	130%	96%	50%	140%
1,1,1-Trichloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	97%	60%	130%	87%	50%	140%
Carbon Tetrachloride	9086386		< 0.05	< 0.05	NA	< 0.05	72%	50%	140%	102%	60%	130%	70%	50%	140%
Benzene	9086386		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	90%	60%	130%	78%	50%	140%
1,2-Dichloropropane	9086386		< 0.03	< 0.03	NA	< 0.03	80%	50%	140%	102%	60%	130%	85%	50%	140%
Trichloroethylene	9086386		< 0.03	< 0.03	NA	< 0.03	88%	50%	140%	98%	60%	130%	78%	50%	140%
Bromodichloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	105%	60%	130%	91%	50%	140%
Methyl Isobutyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	101%	50%	140%	95%	50%	140%	88%	50%	140%
1,1,2-Trichloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	93%	50%	140%	110%	60%	130%	101%	50%	140%
Toluene	9086386		< 0.02	< 0.02	NA	< 0.02	88%	50%	140%	101%	60%	130%	82%	50%	140%
Dibromochloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	101%	60%	130%	92%	50%	140%
Ethylene Dibromide	9086386		< 0.04	< 0.04	NA	< 0.04	87%	50%	140%	101%	60%	130%	92%	50%	140%
Tetrachloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	106%	60%	130%	80%	50%	140%
1,1,1,2-Tetrachloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	101%	50%	140%	99%	60%	130%	89%	50%	140%
Chlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	97%	60%	130%	82%	50%	140%
Ethylbenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	101%	60%	130%	71%	50%	140%
m & p-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	110%	60%	130%	84%	50%	140%
Bromoform	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	101%	60%	130%	91%	50%	140%
Styrene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	92%	60%	130%	83%	50%	140%
1,1,2,2-Tetrachloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	108%	60%	130%	106%	50%	140%
o-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	104%	60%	130%	88%	50%	140%
1,3-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	85%	60%	130%	93%	50%	140%
1,4-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	91%	60%	130%	81%	50%	140%
1,2-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	92%	60%	130%	80%	50%	140%
1,3-Dichloropropene	9086386		< 0.04	< 0.04	NA	< 0.04	105%	50%	140%	98%	60%	130%	114%	50%	140%
n-Hexane	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	100%	60%	130%	88%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Feb 28, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)															
F1 (C6 to C10)	9087379		< 5	< 5	NA	< 5	89%	60%	130%	88%	85%	115%	97%	70%	130%
F2 (C10 to C16)	9086385		< 10	< 10	NA	< 10	92%	60%	130%	84%	80%	120%	83%	70%	130%
F3 (C16 to C34)	9086385		< 50	< 50	NA	< 50	92%	60%	130%	88%	80%	120%	91%	70%	130%
F4 (C34 to C50)	9086385		< 50	< 50	NA	< 50	96%	60%	130%	97%	80%	120%	102%	70%	130%

Comments:
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P &T GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P & T GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	Balance
Moisture Content	VOL-91-5009	CCME Tier 1 Method, SW846 5035,8015	BALANCE
Terphenyl	VOL-91-5009	CCME Tier 1 Method	GC/FID
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314192

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

1 LARGE RED

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Report Information:

Company: Golder
Contact: Alex Wood
Address: 1931 Robertson Rd

Phone: 613-408-4804 Fax:
Reports to be sent to:
1. Email: alexwood@golder.com
2. Email:

Project Information:

Project: 1780158
Site Location: Lincoln Fields
Sampled By: Kim MacDonald
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 *Indicate One*
☒ Ind/Com
☒ Res/Park
☐ Agriculture

Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region *Indicate One*

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other

Indicate One

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Laboratory Use Only

Work Order #: 18731492

Cooler Quantity: one on ice
Arrival Temperatures: 1.8 | 1.5 | 1.3
1.2 | 1.4 | 1.1
Custody Seal Intact: ☐ Yes ☐ No ☐ N/A
Notes: ON ICE

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y / N
17-21 SA1	Feb 22/18		3	S	HOLD	
17-21 SA2	↓		↓	↓	HOLD	
17-21 SA3					HOLD	
17-21 SA5					HOLD	
17-21 SA6					HOLD	
17-21 SA7	↓		↓	↓	HOLD	

Field Filtered - Metals, Hg, CrVI

O. Reg 153

Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
						X	X						
						X	X						
						X	X						
						X	X						
						X	X						
						X	X						

Samples Relinquished By (Print Name and Sign): Alex Wood AWood	Date: Feb 23/18	Time: 12:00p	Samples Received By (Print Name and Sign): CBertheleff	Date: 23feb18	Time: 12h37		
Samples Relinquished By (Print Name and Sign): (BTEX) TOLUENE	Date: 23-feb-18	Time: 15h00	Samples Received By (Print Name and Sign): PARDEEP BANGA	Date: 24/02/18	Time: 9:55 AM	Page ____ of ____	
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:	N°: T 041795	

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z314189

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Gyulhan Yalamova, Report Reviewer

DATE REPORTED: Mar 14, 2018

PAGES (INCLUDING COVER): 20

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - Metals (Including Hydrides) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4	DUP
					SAMPLE TYPE:	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086480	9086484	9103007
Antimony	µg/g	40	7.5	0.8		<0.8[<B]	<0.8[<B]	<0.8[<B]	<0.8[<B]
Arsenic	µg/g	18	18	1		1[<A]	2[<A]	1[<A]	2[<A]
Boron	µg/g	120	120	5		<5[<A]	6[<A]	<5[<A]	7[<A]
Barium	µg/g	670	390	2		290[<B]	93[<B]	29[<B]	74[<B]
Beryllium	µg/g	8	4	0.5		0.6[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Cadmium	µg/g	1.9	1.2	0.5		<0.5[<B]	<0.5[<B]	<0.5[<B]	<0.5[<B]
Chromium	µg/g	160	160	2		55[<A]	13[<A]	7[<A]	13[<A]
Cobalt	µg/g	80	22	0.5		15.9[<B]	7.1[<B]	3.8[<B]	6.9[<B]
Copper	µg/g	230	140	1		33[<B]	13[<B]	9[<B]	13[<B]
Lead	µg/g	120	120	1		7[<A]	6[<A]	3[<A]	6[<A]
Molybdenum	µg/g	40	6.9	0.5		<0.5[<B]	1.0[<B]	<0.5[<B]	0.9[<B]
Nickel	µg/g	270	100	1		34[<B]	13[<B]	6[<B]	12[<B]
Selenium	µg/g	5.5	2.4	0.4		<0.4[<B]	<0.4[<B]	<0.4[<B]	<0.4[<B]
Silver	µg/g	40	20	0.2		<0.2[<B]	<0.2[<B]	<0.2[<B]	<0.2[<B]
Thallium	µg/g	3.3	1	0.4		<0.4[<B]	<0.4[<B]	<0.4[<B]	<0.4[<B]
Uranium	µg/g	33	23	0.5		0.7[<B]	<0.5[<B]	<0.5[<B]	0.5[<B]
Vanadium	µg/g	86	86	1		55[<A]	16[<A]	12[<A]	16[<A]
Zinc	µg/g	340	340	5		90[<A]	19[<A]	12[<A]	17[<A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4	DUP
					SAMPLE TYPE:	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086480	9086484	9103007
pH, 2:1 CaCl2 Extraction	pH Units			NA		8.27	7.84	7.95	7.79
Sodium Adsorption Ratio	NA	12	5	NA		49.2[>A]	17.4[>A]	42.7[>A]	7.04[B-A]

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9103007 SAR was determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

				SAMPLE DESCRIPTION:	17-21 SA1
				SAMPLE TYPE:	Soil
				DATE SAMPLED:	2018-02-22
Parameter	Unit	G / S: A	G / S: B	RDL	9086482
pH, 2:1 CaCl2 Extraction	pH Units			NA	7.61

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086482 pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PAHs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-111 SA3	17-20 SA2	17-109 SA4	DUP
					SAMPLE TYPE:	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20	2018-02-13	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086480	9086484	9103007
Naphthalene	µg/g	9.6	0.6	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Acenaphthylene	µg/g	0.15	0.15	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Acenaphthene	µg/g	96	7.9	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Fluorene	µg/g	62	62	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Phenanthrene	µg/g	12	6.2	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Anthracene	µg/g	0.67	0.67	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Fluoranthene	µg/g	9.6	0.69	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Pyrene	µg/g	96	78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benz(a)anthracene	µg/g	0.96	0.5	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Chrysene	µg/g	9.6	7	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(b)fluoranthene	µg/g	0.96	0.78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(k)fluoranthene	µg/g	0.96	0.78	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzo(a)pyrene	µg/g	0.3	0.3	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Indeno(1,2,3-cd)pyrene	µg/g	0.76	0.38	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Dibenz(a,h)anthracene	µg/g	0.1	0.1	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Benzo(g,h,i)perylene	µg/g	9.6	6.6	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
2-and 1-methyl Naphthalene	µg/g	76	0.99	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Surrogate	Unit		Acceptable Limits						
Chrysene-d12	%		50-140			99	100	82	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9103007 Results are based on the dry weight of the soil.
Note: The result for Benzo(b)Fluoranthene is the total of the Benzo(b)&(j)Fluoranthene isomers because the isomers co-elute on the GC column.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA5	17-21 SA1	17-21 SA3
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-22	2018-02-21
Parameter	Unit	G / S: A	G / S: B	RDL		9086478	9086479	9086481	9086482	9086483
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]	<5[<A]	<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]	<10[<B]	<10[<B]	<10[<B]
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	<50[<B]	<50[<B]	<50[<B]	<50[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]	NA[<B]	NA[<B]	NA[<B]
Moisture Content	%			0.1		10.8	10.0	6.9	17.9	11.3
Surrogate	Unit	Acceptable Limits								
Terphenyl	%	60-140				76	83	74	73	84

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086478-9086483 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified without the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-20 SA2	DUP
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL		9086480	9103007
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]
F2 (C10 to C16) minus Naphthalene	µg/g			10		<10	<10
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	<50[<B]
F3 (C16 to C34) minus PAHs	µg/g			50		<50	<50
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	<50[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]
Moisture Content	%			0.1		11.4	11.0
Surrogate	Unit	Acceptable Limits					
Terphenyl	%	60-140				133	100

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086480-9103007 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-111 SA3	17-109 SA4
					SAMPLE TYPE:	Soil	Soil
					DATE SAMPLED:	2018-02-20	2018-02-13
Parameter	Unit	G / S: A	G / S: B	RDL		9086476	9086484
Benzene	µg/g	0.32	0.21	0.02		<0.02[<B]	<0.02[<B]
Toluene	µg/g	68	2.3	0.08		<0.08[<B]	<0.08[<B]
Ethylbenzene	µg/g	9.5	2	0.05		<0.05[<B]	<0.05[<B]
Xylene Mixture	µg/g	26	3.1	0.05		<0.05[<B]	<0.05[<B]
F1 (C6 to C10)	µg/g	55	55	5		<5[<A]	<5[<A]
F1 (C6 to C10) minus BTEX	µg/g	55	55	5		<5[<A]	<5[<A]
F2 (C10 to C16)	µg/g	230	98	10		<10[<B]	<10[<B]
F2 (C10 to C16) minus Naphthalene	µg/g			10		<10	<10
F3 (C16 to C34)	µg/g	1700	300	50		<50[<B]	210[<B]
F3 (C16 to C34) minus PAHs	µg/g			50		<50	210
F4 (C34 to C50)	µg/g	3300	2800	50		<50[<B]	110[<B]
Gravimetric Heavy Hydrocarbons	µg/g	3300	2800	50		NA[<B]	NA[<B]
Moisture Content	%			0.1		10.3	5.0
Surrogate	Unit	Acceptable Limits					
Terphenyl	%	60-140				110	120

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086476-9086484 Results are based on sample dry weight.
The C6-C10 fraction is calculated using toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX and PAH contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

					SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA2	17-20 SA5	17-21 SA1	17-21 SA3	DUP
					SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
					DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-20	2018-02-22	2018-02-21	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL		9086478	9086479	9086480	9086481	9086482	9086483	9103007
Dichlorodifluoromethane	µg/g	16	16	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Vinyl Chloride	ug/g	0.032	0.02	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Bromomethane	ug/g	0.05	0.05	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Trichlorofluoromethane	ug/g	4	4	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Acetone	ug/g	16	16	0.50		<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]	<0.50[<A]
1,1-Dichloroethylene	ug/g	0.064	0.05	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methylene Chloride	ug/g	1.6	0.1	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Trans- 1,2-Dichloroethylene	ug/g	1.3	0.084	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methyl tert-butyl Ether	ug/g	11	0.75	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1-Dichloroethane	ug/g	17	3.5	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Methyl Ethyl Ketone	ug/g	70	16	0.50		<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]
Cis- 1,2-Dichloroethylene	ug/g	55	3.4	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Chloroform	ug/g	0.47	0.05	0.04		<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
1,2-Dichloroethane	ug/g	0.05	0.05	0.03		<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]	<0.03[<A]
1,1,1-Trichloroethane	ug/g	6.1	0.38	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Carbon Tetrachloride	ug/g	0.21	0.05	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Benzene	ug/g	0.32	0.21	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
1,2-Dichloropropane	ug/g	0.16	0.05	0.03		<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]
Trichloroethylene	ug/g	0.91	0.061	0.03		<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]	<0.03[<B]
Bromodichloromethane	ug/g	18	13	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Methyl Isobutyl Ketone	ug/g	31	1.7	0.50		<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]	<0.50[<B]
1,1,2-Trichloroethane	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]
Toluene	ug/g	68	2.3	0.02		<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]	<0.02[<B]
Dibromochloromethane	ug/g	13	9.4	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Ethylene Dibromide	ug/g	0.05	0.05	0.04		<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]	<0.04[<A]
Tetrachloroethylene	ug/g	4.5	0.28	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1,1,2-Tetrachloroethane	ug/g	0.087	0.058	0.04		<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
Chlorobenzene	ug/g	2.4	2.4	0.05		<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
Ethylbenzene	ug/g	9.5	2	0.05		<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
m & p-Xylene	ug/g			0.05		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Soil)

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-14

				SAMPLE DESCRIPTION:	17-01 SA3	17-01 SA4	17-20 SA2	17-20 SA5	17-21 SA1	17-21 SA3	DUP
				SAMPLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				DATE SAMPLED:	2018-02-21	2018-02-21	2018-02-20	2018-02-20	2018-02-22	2018-02-21	2018-02-20
Parameter	Unit	G / S: A	G / S: B	RDL	9086478	9086479	9086480	9086481	9086482	9086483	9103007
Bromoform	ug/g	0.61	0.27	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Styrene	ug/g	34	0.7	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,1,2,2-Tetrachloroethane	ug/g	0.05	0.05	0.05	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]	<0.05[<A]
o-Xylene	ug/g			0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
1,3-Dichlorobenzene	ug/g	9.6	4.8	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,4-Dichlorobenzene	ug/g	0.2	0.083	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,2-Dichlorobenzene	ug/g	6.8	3.4	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Xylene Mixture	ug/g	26	3.1	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
1,3-Dichloropropene	µg/g	0.18	0.05	0.04	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]	<0.04[<B]
n-Hexane	µg/g	46	2.8	0.05	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]	<0.05[<B]
Surrogate	Unit		Acceptable Limits								
Toluene-d8	% Recovery		50-140		107	95	94	92	92	91	101
4-Bromofluorobenzene	% Recovery		50-140		80	85	79	89	81	83	99

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: A Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Industrial/Commercial/Community Property Use - Coarse Textured Soils, B Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Soil - Residential/Parkland/Institutional Property Use - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9086478-9103007 The sample was analysed using the high level technique. The sample was extracted using methanol, a small amount of the methanol extract was diluted in water and the purge & trap GC/MS analysis was performed. Results are based on the dry weight of the soil.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Guideline Violation

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
9086476	17-111 SA3	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	49.2
9086476	17-111 SA3	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	49.2
9086480	17-20 SA2	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	17.4
9086480	17-20 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	17.4
9086484	17-109 SA4	ON T3 S ICC CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	12	42.7
9086484	17-109 SA4	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	42.7
9103007	DUP	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	7.04

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z314189

PROJECT: 1780158
ATTENTION TO: Alex Wood

SAMPLING SITE:
SAMPLED BY:

Soil Analysis

RPT Date: Mar 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	9081332		<0.8	<0.8	NA	< 0.8	108%	70%	130%	105%	80%	120%	78%	70%	130%
Arsenic	9081332		1	1	NA	< 1	107%	70%	130%	101%	80%	120%	99%	70%	130%
Boron	9081332		<5	<5	NA	< 5	71%	70%	130%	111%	80%	120%	71%	70%	130%
Barium	9081332		203	204	0.5%	< 2	102%	70%	130%	99%	80%	120%	103%	70%	130%
Beryllium	9081332		0.5	<0.5	NA	< 0.5	93%	70%	130%	113%	80%	120%	73%	70%	130%
Cadmium	9081332		<0.5	<0.5	NA	< 0.5	105%	70%	130%	99%	80%	120%	98%	70%	130%
Chromium	9081332		51	50	2.0%	< 2	93%	70%	130%	100%	80%	120%	110%	70%	130%
Cobalt	9081332		13.8	13.8	0.0%	< 0.5	96%	70%	130%	103%	80%	120%	95%	70%	130%
Copper	9081332		30	29	3.4%	< 1	94%	70%	130%	104%	80%	120%	88%	70%	130%
Lead	9081332		5	5	0.0%	< 1	109%	70%	130%	91%	80%	120%	90%	70%	130%
Molybdenum	9081332		<0.5	<0.5	NA	< 0.5	98%	70%	130%	101%	80%	120%	100%	70%	130%
Nickel	9081332		32	31	3.2%	< 1	99%	70%	130%	110%	80%	120%	100%	70%	130%
Selenium	9081332		<0.4	<0.4	NA	< 0.4	110%	70%	130%	102%	80%	120%	97%	70%	130%
Silver	9081332		<0.2	<0.2	NA	< 0.2	89%	70%	130%	95%	80%	120%	91%	70%	130%
Thallium	9081332		<0.4	<0.4	NA	< 0.4	112%	70%	130%	103%	80%	120%	103%	70%	130%
Uranium	9081332		<0.5	<0.5	NA	< 0.5	91%	70%	130%	101%	80%	120%	102%	70%	130%
Vanadium	9081332		48	46	4.3%	< 1	84%	70%	130%	95%	80%	120%	94%	70%	130%
Zinc	9081332		85	83	2.4%	< 5	103%	70%	130%	104%	80%	120%	100%	70%	130%
O. Reg. 153(511) - ORPs (Soil)															
pH, 2:1 CaCl2 Extraction	9107591		7.52	7.51	0.1%	NA	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio	9090102		2.42	2.44	0.8%	NA	NA			NA			NA		
O. Reg. 153(511) - Metals (Including Hydrides) (Soil)															
Antimony	9102698		<0.8	<0.8	NA	< 0.8	100%	70%	130%	106%	80%	120%	83%	70%	130%
Arsenic	9102698		3	3	NA	< 1	101%	70%	130%	104%	80%	120%	107%	70%	130%
Boron	9102698		<5	<5	NA	< 5	86%	70%	130%	101%	80%	120%	90%	70%	130%
Barium	9102698		38	37	2.7%	< 2	104%	70%	130%	102%	80%	120%	103%	70%	130%
Beryllium	9102698		<0.5	<0.5	NA	< 0.5	78%	70%	130%	97%	80%	120%	94%	70%	130%
Cadmium	9102698		<0.5	<0.5	NA	< 0.5	99%	70%	130%	100%	80%	120%	107%	70%	130%
Chromium	9102698		10	10	0.0%	< 2	86%	70%	130%	105%	80%	120%	106%	70%	130%
Cobalt	9102698		4.3	4.3	0.0%	< 0.5	97%	70%	130%	108%	80%	120%	111%	70%	130%
Copper	9102698		14	15	6.9%	< 1	89%	70%	130%	104%	80%	120%	108%	70%	130%
Lead	9102698		15	14	6.9%	< 1	106%	70%	130%	106%	80%	120%	103%	70%	130%
Molybdenum	9102698		<0.5	<0.5	NA	< 0.5	96%	70%	130%	104%	80%	120%	109%	70%	130%
Nickel	9102698		9	9	0.0%	< 1	90%	70%	130%	99%	80%	120%	103%	70%	130%
Selenium	9102698		<0.4	<0.4	NA	< 0.4	114%	70%	130%	98%	80%	120%	107%	70%	130%
Silver	9102698		<0.2	<0.2	NA	< 0.2	72%	70%	130%	102%	80%	120%	91%	70%	130%
Thallium	9102698		<0.4	<0.4	NA	< 0.4	99%	70%	130%	103%	80%	120%	100%	70%	130%
Uranium	9102698		<0.5	<0.5	NA	< 0.5	92%	70%	130%	100%	80%	120%	102%	70%	130%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Soil Analysis (Continued)

RPT Date: Mar 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Vanadium	9102698		16	17	6.1%	< 1	88%	70%	130%	101%	80%	120%	96%	70%	130%
Zinc	9102698		65	62	4.7%	< 5	96%	70%	130%	106%	80%	120%	118%	70%	130%
O. Reg. 153(511) - ORPs (Soil)															
pH, 2:1 CaCl2 Extraction	9107591		7.52	7.51	0.1%	NA	100%	90%	110%	NA			NA		
Sodium Adsorption Ratio	9103007	9103007	7.04	7.08	0.6%	NA	NA			NA			NA		

Comments: NA signifies Not Applicable.
Duplicate Qualifier: As the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By: Amanjot Bhela

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Mar 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	9081930		< 0.02	< 0.02	NA	< 0.02	91%	60%	130%	86%	60%	130%	105%	60%	130%
Toluene	9081930		< 0.08	< 0.08	NA	< 0.08	89%	60%	130%	87%	60%	130%	107%	60%	130%
Ethylbenzene	9081930		< 0.05	< 0.05	NA	< 0.05	89%	60%	130%	88%	60%	130%	110%	60%	130%
Xylene Mixture	9081930		< 0.05	< 0.05	NA	< 0.05	88%	60%	130%	88%	60%	130%	104%	60%	130%
F1 (C6 to C10)	9081930		< 5	< 5	NA	< 5	89%	60%	130%	88%	85%	115%	97%	70%	130%
F2 (C10 to C16)	9086385		< 10	< 10	NA	< 10	92%	60%	130%	84%	80%	120%	83%	70%	130%
F3 (C16 to C34)	9086385		< 50	< 50	NA	< 50	92%	60%	130%	88%	80%	120%	91%	70%	130%
F4 (C34 to C50)	9086385		< 50	< 50	NA	< 50	96%	60%	130%	97%	80%	120%	102%	70%	130%
O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)															
Benzene	9079035		< 0.02	< 0.02	NA	< 0.02	110%	60%	130%	92%	60%	130%	101%	60%	130%
Toluene	9079035		< 0.08	< 0.08	NA	< 0.08	109%	60%	130%	95%	60%	130%	106%	60%	130%
Ethylbenzene	9079035		< 0.05	< 0.05	NA	< 0.05	109%	60%	130%	99%	60%	130%	109%	60%	130%
Xylene Mixture	9079035		< 0.05	< 0.05	NA	< 0.05	105%	60%	130%	93%	60%	130%	102%	60%	130%
F1 (C6 to C10)	9045803		< 5	< 5	NA	< 5	84%	60%	130%	90%	85%	115%	94%	70%	130%
O. Reg. 153(511) - VOCs (Soil)															
Dichlorodifluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	93%	50%	140%	115%	50%	140%	94%	50%	140%
Vinyl Chloride	9086386		< 0.02	< 0.02	NA	< 0.02	101%	50%	140%	113%	50%	140%	80%	50%	140%
Bromomethane	9086386		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	113%	50%	140%	86%	50%	140%
Trichlorofluoromethane	9086386		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	119%	50%	140%	82%	50%	140%
Acetone	9086386		< 0.50	< 0.50	NA	< 0.50	100%	50%	140%	108%	50%	140%	98%	50%	140%
1,1-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	80%	50%	140%	102%	60%	130%	88%	50%	140%
Methylene Chloride	9086386		< 0.05	< 0.05	NA	< 0.05	75%	50%	140%	98%	60%	130%	85%	50%	140%
Trans- 1,2-Dichloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	73%	50%	140%	98%	60%	130%	78%	50%	140%
Methyl tert-butyl Ether	9086386		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	95%	60%	130%	75%	50%	140%
1,1-Dichloroethane	9086386		< 0.02	< 0.02	NA	< 0.02	91%	50%	140%	95%	60%	130%	95%	50%	140%
Methyl Ethyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	87%	50%	140%	99%	50%	140%	81%	50%	140%
Cis- 1,2-Dichloroethylene	9086386		< 0.02	< 0.02	NA	< 0.02	77%	50%	140%	106%	60%	130%	84%	50%	140%
Chloroform	9086386		< 0.04	< 0.04	NA	< 0.04	85%	50%	140%	102%	60%	130%	97%	50%	140%
1,2-Dichloroethane	9086386		< 0.03	< 0.03	NA	< 0.03	87%	50%	140%	100%	60%	130%	96%	50%	140%
1,1,1-Trichloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	79%	50%	140%	97%	60%	130%	87%	50%	140%
Carbon Tetrachloride	9086386		< 0.05	< 0.05	NA	< 0.05	72%	50%	140%	102%	60%	130%	70%	50%	140%
Benzene	9086386		< 0.02	< 0.02	NA	< 0.02	83%	50%	140%	90%	60%	130%	78%	50%	140%
1,2-Dichloropropane	9086386		< 0.03	< 0.03	NA	< 0.03	80%	50%	140%	102%	60%	130%	85%	50%	140%
Trichloroethylene	9086386		< 0.03	< 0.03	NA	< 0.03	88%	50%	140%	98%	60%	130%	78%	50%	140%
Bromodichloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	105%	60%	130%	91%	50%	140%
Methyl Isobutyl Ketone	9086386		< 0.50	< 0.50	NA	< 0.50	101%	50%	140%	95%	50%	140%	88%	50%	140%
1,1,2-Trichloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	93%	50%	140%	110%	60%	130%	101%	50%	140%
Toluene	9086386		< 0.02	< 0.02	NA	< 0.02	88%	50%	140%	101%	60%	130%	82%	50%	140%
Dibromochloromethane	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	101%	60%	130%	92%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z314189

PROJECT: 1780158
ATTENTION TO: Alex Wood

SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 14, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Ethylene Dibromide	9086386		< 0.04	< 0.04	NA	< 0.04	87%	50%	140%	101%	60%	130%	92%	50%	140%
Tetrachloroethylene	9086386		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	106%	60%	130%	80%	50%	140%
1,1,1,2-Tetrachloroethane	9086386		< 0.04	< 0.04	NA	< 0.04	101%	50%	140%	99%	60%	130%	89%	50%	140%
Chlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	97%	60%	130%	82%	50%	140%
Ethylbenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	101%	60%	130%	71%	50%	140%
m & p-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	110%	60%	130%	84%	50%	140%
Bromoform	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	101%	60%	130%	91%	50%	140%
Styrene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	92%	60%	130%	83%	50%	140%
1,1,2,2-Tetrachloroethane	9086386		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	108%	60%	130%	106%	50%	140%
o-Xylene	9086386		< 0.05	< 0.05	NA	< 0.05	83%	50%	140%	104%	60%	130%	88%	50%	140%
1,3-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	85%	60%	130%	93%	50%	140%
1,4-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	81%	50%	140%	91%	60%	130%	81%	50%	140%
1,2-Dichlorobenzene	9086386		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	92%	60%	130%	80%	50%	140%
1,3-Dichloropropene	9086386		< 0.04	< 0.04	NA	< 0.04	105%	50%	140%	98%	60%	130%	114%	50%	140%
n-Hexane	9086386		< 0.05	< 0.05	NA	< 0.05	89%	50%	140%	100%	60%	130%	88%	50%	140%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	9083880		< 0.05	< 0.05	NA	< 0.05	88%	50%	140%	96%	50%	140%	75%	50%	140%
Acenaphthylene	9083880		< 0.05	< 0.05	NA	< 0.05	102%	50%	140%	106%	50%	140%	84%	50%	140%
Acenaphthene	9083880		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	99%	50%	140%	81%	50%	140%
Fluorene	9083880		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	115%	50%	140%	98%	50%	140%
Phenanthrene	9083880		0.21	0.21	NA	< 0.05	116%	50%	140%	110%	50%	140%	112%	50%	140%
Anthracene	9083880		< 0.05	0.05	NA	< 0.05	96%	50%	140%	91%	50%	140%	101%	50%	140%
Fluoranthene	9083880		0.46	0.49	6.3%	< 0.05	111%	50%	140%	107%	50%	140%	113%	50%	140%
Pyrene	9083880		0.37	0.40	7.8%	< 0.05	109%	50%	140%	108%	50%	140%	113%	50%	140%
Benz(a)anthracene	9083880		0.19	0.21	NA	< 0.05	99%	50%	140%	102%	50%	140%	106%	50%	140%
Chrysene	9083880		0.18	0.19	NA	< 0.05	99%	50%	140%	110%	50%	140%	109%	50%	140%
Benzo(b)fluoranthene	9083880		0.35	0.33	5.9%	< 0.05	84%	50%	140%	94%	50%	140%	90%	50%	140%
Benzo(k)fluoranthene	9083880		0.16	0.15	NA	< 0.05	87%	50%	140%	87%	50%	140%	79%	50%	140%
Benzo(a)pyrene	9083880		0.23	0.22	NA	< 0.05	97%	50%	140%	92%	50%	140%	91%	50%	140%
Indeno(1,2,3-cd)pyrene	9083880		0.08	0.09	NA	< 0.05	93%	50%	140%	101%	50%	140%	81%	50%	140%
Dibenz(a,h)anthracene	9083880		< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	100%	50%	140%	94%	50%	140%
Benzo(g,h,i)perylene	9083880		0.09	0.09	NA	< 0.05	77%	50%	140%	87%	50%	140%	76%	50%	140%
2-and 1-methyl Naphthalene	9083880		< 0.05	< 0.05	NA	< 0.05	82%	50%	140%	85%	50%	140%	68%	50%	140%

Comments:
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 14, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Antimony	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Selenium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
pH, 2:1 CaCl2 Extraction	INOR-93-6031	MSA part 3 & SM 4500-H+ B	pH METER
Sodium Adsorption Ratio	INOR-93-6007	McKeague 4.12 & 3.26 & EPA SW-846 6010C	ICP/OES

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Acenaphthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluorene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Phenanthrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benz(a)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(b)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(k)fluoranthene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(a)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Indeno(1,2,3-cd)pyrene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Dibenz(a,h)anthracene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Benzo(g,h,i)perylene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
2-and 1-methyl Naphthalene	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
Chrysene-d12	ORG-91-5106	EPA SW846 3541 & 8270	GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P &T GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method, SW846 5035	P & T GC / FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	Balance
Moisture Content	VOL-91-5009	CCME Tier 1 Method, SW846 5035,8015	BALANCE
Terphenyl	VOL-91-5009	CCME Tier 1 Method	GC/FID
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	GC / FID
F2 (C10 to C16) minus Naphthalene	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method	GC / FID
F3 (C16 to C34) minus PAHs	VOL-91-5009	CCME Tier 1 Method	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Dichlorodifluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Acetone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trans- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl tert-butyl Ether	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z314189

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Methyl Ethyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Cis- 1,2-Dichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Benzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Styrene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5002	EPA SW-846 5035 & 8260	(P&T)GC/MS

AGAT Laboratories

1 LARGE RED

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 1823141189

Cooler Quantity: one-onice

Arrival Temperatures: 1.8 | 1.5 | 1.3 | 1.2 | 1.3 | 1.2

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: ON ICE

Report Information:

Company: Golder
Contact: Alex Wood
Address: 1931 Robertson Rd

Phone: 613-408-4804 Fax:

Reports to be sent to:
1. Email: alexwood@golder.com
2. Email:

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 *Indicate One*
☒ Ind/Com
☒ Res/Park
☐ Agriculture

Soil Texture *(Check One)*
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region _____ *Indicate One*

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other

_____ *Indicate One*

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1780158
Site Location: Lincoln Fields
Sampled By: Kim MacDonald
AGAT Quote #: PO:

Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	O. Reg 153: Full Metals Scan	O. Reg 153: Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	O. Reg 153: Volatiles: ☒ VOC ☐ BTEX ☐ THM	O. Reg 153: CCME Fractions 1 to 4	O. Reg 153: ABNs	O. Reg 153: PAHs	O. Reg 153: PCBs: ☐ Total ☐ Aroclors	O. Reg 153: Organochlorine Pesticides	O. Reg 153: TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	O. Reg 153: Sewer Use
17-111 SA 3	See Jar		3	S					X				X		X				
17-01 SA3	↓		3	S								X	X						
17-01 SA4			3	S								X	X						
17-20 SA2			3	S					X			X	X		X				
17-20 SA5			3	S								X	X						
17-21 SA1			3	S								X	X						
17-21 SA3			3	S								X	X						
17-109 SA4	Feb 13/18		3	S					X				X		X				

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Alex Wood AWood			[illegible]	23-Feb-18	12h30
[illegible]	23Feb18	15h00	PARDEEP BOPARAI	24/02/18	9:55 AM

Page _____ of _____

N°: T 041794

WATER

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z315692

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Mar 07, 2018

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049
F1 (C6 to C10)	µg/L		25	<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA
Surrogate	Unit	Acceptable Limits								
Terphenyl	%	60-140		100	97	93	101	100	96	109

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9094032-9094049 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1/BTEX (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		Trip Blank
		SAMPLE TYPE:		Water
		DATE SAMPLED:		
Parameter	Unit	G / S	RDL	9094050
F1 (C6 to C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9094050 The C6-C10 fraction is calculated using Toluene response factor.
Total C6-C10 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
Extraction and holding times were met for this sample.
NA = Not Applicable

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

SAMPLE DESCRIPTION:				17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19	Trip Blank
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049	9094050
Dichlorodifluoromethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L		0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L		0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049	9094050
Bromoform	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene Mixture	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits									
Toluene-d8	% Recovery	50-140		93	94	105	85	90	92	91	92
4-Bromofluorobenzene	% Recovery	50-140		103	97	94	107	90	90	87	88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z315692
PROJECT: 1780158
ATTENTION TO: Alex Wood
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Mar 07, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	9092559		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	82%	50%	140%	102%	50%	140%
Vinyl Chloride	9092559		< 0.17	< 0.17	NA	< 0.17	80%	50%	140%	119%	50%	140%	122%	50%	140%
Bromomethane	9092559		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	103%	50%	140%	108%	50%	140%
Trichlorofluoromethane	9092559		< 0.40	< 0.40	NA	< 0.40	84%	50%	140%	98%	50%	140%	110%	50%	140%
Acetone	9092559		< 1.0	< 1.0	NA	< 1.0	123%	50%	140%	102%	50%	140%	109%	50%	140%
1,1-Dichloroethylene	9092559		< 0.30	< 0.30	NA	< 0.30	72%	50%	140%	104%	60%	130%	111%	50%	140%
Methylene Chloride	9092559		< 0.30	< 0.30	NA	< 0.30	102%	50%	140%	115%	60%	130%	98%	50%	140%
trans- 1,2-Dichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	107%	60%	130%	112%	50%	140%
Methyl tert-butyl ether	9092559		< 0.20	< 0.20	NA	< 0.20	100%	50%	140%	96%	60%	130%	110%	50%	140%
1,1-Dichloroethane	9092559		< 0.30	< 0.30	NA	< 0.30	95%	50%	140%	99%	60%	130%	111%	50%	140%
Methyl Ethyl Ketone	9092559		< 1.0	< 1.0	NA	< 1.0	118%	50%	140%	87%	50%	140%	85%	50%	140%
cis- 1,2-Dichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	76%	50%	140%	99%	60%	130%	94%	50%	140%
Chloroform	9092559		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	115%	60%	130%	112%	50%	140%
1,2-Dichloroethane	9092559		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	115%	60%	130%	117%	50%	140%
1,1,1-Trichloroethane	9092559		< 0.30	< 0.30	NA	< 0.30	71%	50%	140%	107%	60%	130%	104%	50%	140%
Carbon Tetrachloride	9092559		< 0.20	< 0.20	NA	< 0.20	72%	50%	140%	90%	60%	130%	89%	50%	140%
Benzene	9092559		< 0.20	< 0.20	NA	< 0.20	73%	50%	140%	85%	60%	130%	95%	50%	140%
1,2-Dichloropropane	9092559		< 0.20	< 0.20	NA	< 0.20	74%	50%	140%	87%	60%	130%	88%	50%	140%
Trichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	96%	60%	130%	102%	50%	140%
Bromodichloromethane	9092559		< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	106%	60%	130%	105%	50%	140%
Methyl Isobutyl Ketone	9092559		< 1.0	< 1.0	NA	< 1.0	111%	50%	140%	78%	50%	140%	82%	50%	140%
1,1,2-Trichloroethane	9092559		< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	99%	60%	130%	109%	50%	140%
Toluene	9092559		< 0.20	< 0.20	NA	< 0.20	74%	50%	140%	94%	60%	130%	102%	50%	140%
Dibromochloromethane	9092559		< 0.10	< 0.10	NA	< 0.10	95%	50%	140%	107%	60%	130%	105%	50%	140%
Ethylene Dibromide	9092559		< 0.10	< 0.10	NA	< 0.10	103%	50%	140%	97%	60%	130%	105%	50%	140%
Tetrachloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	104%	60%	130%	111%	50%	140%
1,1,1,2-Tetrachloroethane	9092559		< 0.10	< 0.10	NA	< 0.10	112%	50%	140%	105%	60%	130%	104%	50%	140%
Chlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	93%	50%	140%	107%	60%	130%	114%	50%	140%
Ethylbenzene	9092559		< 0.10	< 0.10	NA	< 0.10	71%	50%	140%	93%	60%	130%	99%	50%	140%
m & p-Xylene	9092559		< 0.20	< 0.20	NA	< 0.20	83%	50%	140%	103%	60%	130%	111%	50%	140%
Bromoform	9092559		< 0.10	< 0.10	NA	< 0.10	117%	50%	140%	111%	60%	130%	111%	50%	140%
Styrene	9092559		< 0.10	< 0.10	NA	< 0.10	73%	50%	140%	87%	60%	130%	94%	50%	140%
1,1,2,2-Tetrachloroethane	9092559		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	92%	60%	130%	103%	50%	140%
o-Xylene	9092559		< 0.10	< 0.10	NA	< 0.10	92%	50%	140%	109%	60%	130%	93%	50%	140%
1,3-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	104%	60%	130%	109%	50%	140%
1,4-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	117%	50%	140%	116%	60%	130%	104%	50%	140%
1,2-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	103%	60%	130%	109%	50%	140%
1,3-Dichloropropene	9092559		< 0.30	< 0.30	NA	< 0.30	78%	50%	140%	76%	60%	130%	76%	50%	140%
n-Hexane	9092559		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	109%	60%	130%	96%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 07, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)															
F1 (C6 to C10)	9094041	9094041	< 25	< 25	NA	< 25	84%	60%	140%	110%	60%	140%	96%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	96%	60%	140%	74%	60%	140%	68%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	94%	60%	140%	106%	60%	140%	102%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	81%	60%	140%	74%	60%	140%	85%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 to C10)	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC / FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC / FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

1 Med

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Golder Associates Ltd.
Contact: Alex Wood
Address: 1931 Robertson Rd

Phone: 613-592-9600 Fax: 592-9601
Reports to be sent to:
1. Email: Alex_Wood@golder.com
2. Email:

Project Information:

Project: 1780158 -
Site Location: 2525 Carling/Lincoln Fields Shopping
Sampled By: Kim MacDonald
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
Indicate One

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 18235692

Cooler Quantity: one
Arrival Temperatures: 9.2 | 9.2 | 8.8
86 | 83 | 79
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes: on ice

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI Y/N	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_2+NO_3	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☒ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
17-20	FEB 28	2:30PM	7	GW								X	X					
17-25	FEB 28	9:25AM	7	GW								X	X					
17-06	FEB 28	12:30	7	GW								X	X					
02-6	FEB 28	11:00	8	GW								X	X			X		
~~DUP~~ DUP026	FEB 28	11:00	7	GW								X	X					
02-5	FEB 28	10:15	8	GW								X	X			X		
17-19	FEB 28	1:00 PM	7	GW								X	X					

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Kim MacDonald Kim MacDonald	FEB 28	4:15PM	(Bethelet)	28-Feb-18	16h15
CBS to FedEx 28Feb18	18/3/1	16h30	Sima	10 14	

Page 1 of 1

№: T 063383

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Keith Holmes

PROJECT: 1780158

AGAT WORK ORDER: 17Z293747

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Dec 15, 2017

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - PCBs (Water)

DATE RECEIVED: 2017-12-11

DATE REPORTED: 2017-12-15

		SAMPLE DESCRIPTION:		17-08	DUP1
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2017-12-11	2017-12-11
Parameter	Unit	G / S	RDL	8967712	8967713
Polychlorinated Biphenyls	µg/L	7.8	0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits			
Decachlorobiphenyl	%	60-140		65	64

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

DATE RECEIVED: 2017-12-11

DATE REPORTED: 2017-12-15

				SAMPLE DESCRIPTION:	17-108	17-101	17-08	DUP1
				SAMPLE TYPE:	Water	Water	Water	Water
				DATE SAMPLED:	2017-12-11	2017-12-11	2017-12-11	2017-12-11
Parameter	Unit	G / S	RDL		8967708	8967711	8967712	8967713
F1 (C6 to C10)	µg/L	750	25		<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25		<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100		<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100		<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100		<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500		NA	NA	NA	NA
Surrogate	Unit	Acceptable Limits						
Terphenyl	%	60-140			84	73	78	62

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8967708-8967713 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2017-12-11

DATE REPORTED: 2017-12-15

		SAMPLE DESCRIPTION:		17-108	17-101	17-08	DUP1	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-12-11	2017-12-11	2017-12-11	2017-12-11	2017-12-11
Parameter	Unit	G / S	RDL	8967708	8967711	8967712	8967713	8967714
Dichlorodifluoromethane	µg/L	4400	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L	0.5	0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L	5.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	2500	0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L	130000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L	1.6	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	610	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	190	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	320	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	470000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	0.20	<0.20	<0.20	0.22	0.26	<0.20
1,2-Dichloroethane	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L	640	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	0.79	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L	44	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	16	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	85000	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L	140000	1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L	4.7	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	0.84	0.64	0.28	0.32	<0.20
Dibromochloromethane	µg/L	82000	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	0.25	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	630	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Certified By: N Popowich

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2017-12-11

DATE REPORTED: 2017-12-15

		SAMPLE DESCRIPTION:		17-108	17-101	17-08	DUP1	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-12-11	2017-12-11	2017-12-11	2017-12-11	2017-12-11
Parameter	Unit	G / S	RDL	8967708	8967711	8967712	8967713	8967714
Bromoform	µg/L	380	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L	1300	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	9600	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	8	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	4600	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L	5.2	0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene Mixture	µg/L	4200	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L	51	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits						
Toluene-d8	% Recovery	50-140		97	88	87	89	89
4-Bromofluorobenzene	% Recovery	50-140		97	98	96	94	95

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
PROJECT: 1780158
SAMPLING SITE:Lincoln Fields

AGAT WORK ORDER: 17Z293747
ATTENTION TO: Keith Holmes
SAMPLED BY:Aaron Bradshaw

Trace Organics Analysis

RPT Date: Dec 15, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)															
F1 (C6 to C10)	8964683		< 25	< 25	NA	< 25	95%	60%	140%	81%	60%	140%	80%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	96%	60%	140%	75%	60%	140%	64%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	96%	60%	140%	92%	60%	140%	84%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	98%	60%	140%	86%	60%	140%	85%	60%	140%
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	8962685		< 0.20	< 0.20	NA	< 0.20	112%	50%	140%	90%	50%	140%	74%	50%	140%
Vinyl Chloride	8962685		< 0.17	< 0.17	NA	< 0.17	104%	50%	140%	104%	50%	140%	96%	50%	140%
Bromomethane	8962685		< 0.20	< 0.20	NA	< 0.20	74%	50%	140%	90%	50%	140%	86%	50%	140%
Trichlorofluoromethane	8962685		< 0.40	< 0.40	NA	< 0.40	64%	50%	140%	92%	50%	140%	86%	50%	140%
Acetone	8962685		< 1.0	< 1.0	NA	< 1.0	113%	50%	140%	114%	50%	140%	110%	50%	140%
1,1-Dichloroethylene	8962685		< 0.30	< 0.30	NA	< 0.30	69%	50%	140%	78%	60%	130%	106%	50%	140%
Methylene Chloride	8962685		< 0.30	< 0.30	NA	< 0.30	67%	50%	140%	95%	60%	130%	112%	50%	140%
trans- 1,2-Dichloroethylene	8962685		< 0.20	< 0.20	NA	< 0.20	116%	50%	140%	86%	60%	130%	93%	50%	140%
Methyl tert-butyl ether	8962685		< 0.20	< 0.20	NA	< 0.20	101%	50%	140%	92%	60%	130%	88%	50%	140%
1,1-Dichloroethane	8962685		< 0.30	< 0.30	NA	< 0.30	88%	50%	140%	87%	60%	130%	112%	50%	140%
Methyl Ethyl Ketone	8962685		< 1.0	< 1.0	NA	< 1.0	126%	50%	140%	100%	50%	140%	93%	50%	140%
cis- 1,2-Dichloroethylene	8962685		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	106%	60%	130%	117%	50%	140%
Chloroform	8962685		< 0.20	< 0.20	NA	< 0.20	73%	50%	140%	89%	60%	130%	98%	50%	140%
1,2-Dichloroethane	8962685		< 0.20	< 0.20	NA	< 0.20	83%	50%	140%	93%	60%	130%	96%	50%	140%
1,1,1-Trichloroethane	8962685		< 0.30	< 0.30	NA	< 0.30	107%	50%	140%	76%	60%	130%	92%	50%	140%
Carbon Tetrachloride	8962685		< 0.20	< 0.20	NA	< 0.20	72%	50%	140%	70%	60%	130%	76%	50%	140%
Benzene	8962685		< 0.20	< 0.20	NA	< 0.20	66%	50%	140%	72%	60%	130%	81%	50%	140%
1,2-Dichloropropane	8962685		< 0.20	< 0.20	NA	< 0.20	68%	50%	140%	80%	60%	130%	87%	50%	140%
Trichloroethylene	8962685		< 0.20	< 0.20	NA	< 0.20	76%	50%	140%	74%	60%	130%	87%	50%	140%
Bromodichloromethane	8962685		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	84%	60%	130%	91%	50%	140%
Methyl Isobutyl Ketone	8962685		< 1.0	< 1.0	NA	< 1.0	85%	50%	140%	85%	50%	140%	86%	50%	140%
1,1,2-Trichloroethane	8962685		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	109%	60%	130%	107%	50%	140%
Toluene	8962685		< 0.20	< 0.20	NA	< 0.20	70%	50%	140%	89%	60%	130%	95%	50%	140%
Dibromochloromethane	8962685		< 0.10	< 0.10	NA	< 0.10	79%	50%	140%	90%	60%	130%	95%	50%	140%
Ethylene Dibromide	8962685		< 0.10	< 0.10	NA	< 0.10	76%	50%	140%	98%	60%	130%	99%	50%	140%
Tetrachloroethylene	8962685		< 0.20	< 0.20	NA	< 0.20	71%	50%	140%	90%	60%	130%	96%	50%	140%
1,1,1,2-Tetrachloroethane	8962685		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	87%	60%	130%	98%	50%	140%
Chlorobenzene	8962685		< 0.10	< 0.10	NA	< 0.10	91%	50%	140%	97%	60%	130%	104%	50%	140%
Ethylbenzene	8962685		< 0.10	< 0.10	NA	< 0.10	70%	50%	140%	78%	60%	130%	82%	50%	140%
m & p-Xylene	8962685		< 0.20	< 0.20	NA	< 0.20	76%	50%	140%	82%	60%	130%	88%	50%	140%
Bromoform	8962685		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	84%	60%	130%	86%	50%	140%
Styrene	8962685		< 0.10	< 0.10	NA	< 0.10	61%	50%	140%	73%	60%	130%	75%	50%	140%
1,1,2,2-Tetrachloroethane	8962685		< 0.10	< 0.10	NA	< 0.10	67%	50%	140%	106%	60%	130%	97%	50%	140%
o-Xylene	8962685		< 0.10	< 0.10	NA	< 0.10	81%	50%	140%	87%	60%	130%	90%	50%	140%

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 17Z293747
PROJECT: 1780158
ATTENTION TO: Keith Holmes
SAMPLING SITE:Lincoln Fields
SAMPLED BY:Aaron Bradshaw

Trace Organics Analysis (Continued)

RPT Date: Dec 15, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	8962685		< 0.10	< 0.10	NA	< 0.10	91%	50%	140%	85%	60%	130%	90%	50%	140%
1,4-Dichlorobenzene	8962685		< 0.10	< 0.10	NA	< 0.10	103%	50%	140%	98%	60%	130%	98%	50%	140%
1,2-Dichlorobenzene	8962685		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	89%	60%	130%	89%	50%	140%
1,3-Dichloropropene	8962685		< 0.30	< 0.30	NA	< 0.30	111%	50%	140%	65%	60%	130%	77%	50%	140%
n-Hexane	8962685		< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	101%	60%	130%	77%	50%	140%
O. Reg. 153(511) - PCBs (Water)															
Polychlorinated Biphenyls		TW	< 0.1	< 0.1	NA	< 0.1	105%	60%	140%	99%	60%	140%	111%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Polychlorinated Biphenyls	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
F1 (C6 to C10)	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC / FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC / FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 17Z293747

PROJECT: 1780158

ATTENTION TO: Keith Holmes

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only

Work Order #: 17293747

Cooler Quantity: one on ice

Arrival Temperatures: 8.1 | 8.7 | 8.5
6.9 | 7 | 7.2

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes: one

Report Information:

Company: Golder Associates
Contact: Keith Holmes
Address: 1931 Robertson Rd.
Bells Corners
Phone: 613-592-9600 Fax:
Reports to be sent to:
1. Email: Keith_holmes@Golder.com
2. Email:

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 3 (Indicate One)
☒ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a **Record of Site Condition?** ☒ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1780158
Site Location: Lincoln Fields
Sampled By: Aaron Bradshaw
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides)	Hydride Metals ☐ 153 Metals (incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl ☐ CN	☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg	☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN	☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☒ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
17-108	17/12/11	930	4	GW		N											X	X						
17-101		1010	4			N											X	X						
17-08		1110	5			N											X	X			X			
DUP1		1105	5			N											X	X			X			
Trip Blank			3			N											X	X						

Samples Relinquished By (Print Name and Sign): Aaron Bradshaw	Date: 17/12/11	Time: 12:10	Samples Received By (Print Name and Sign): CBerthelet	Date: 11-Dec-17	Time: 14h00
Samples Relinquished By (Print Name and Sign): CBerthelet Fedex	Date: 11-Dec-17	Time: 16h00	Samples Received By (Print Name and Sign):	Date:	Time:
Samples Relinquished By (Print Name and Sign):	Date:	Time:	Samples Received By (Print Name and Sign):	Date:	Time:

Page 1 of 1

Nº: T 065219 ✓

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z315692

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Mar 07, 2018

PAGES (INCLUDING COVER): 10

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049
F1 (C6 to C10)	µg/L		25	<25	<25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25	<25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L		100	<100	<100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L		500	NA	NA	NA	NA	NA	NA	NA
Surrogate	Unit	Acceptable Limits								
Terphenyl	%	60-140		100	97	93	101	100	96	109

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9094032-9094049 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - PHCs F1/BTEX (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		Trip Blank
		SAMPLE TYPE:		Water
		DATE SAMPLED:		
Parameter	Unit	G / S	RDL	9094050
F1 (C6 to C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L		25	<25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

9094050 The C6-C10 fraction is calculated using Toluene response factor.
Total C6-C10 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
Extraction and holding times were met for this sample.
NA = Not Applicable

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

SAMPLE DESCRIPTION:				17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19	Trip Blank
SAMPLE TYPE:				Water	Water	Water	Water	Water	Water	Water	Water
DATE SAMPLED:				2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049	9094050
Dichlorodifluoromethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L		0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L		0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
Acetone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Chloroform	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Benzene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L		1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Dibromochloromethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-02-28

DATE REPORTED: 2018-03-07

		SAMPLE DESCRIPTION:		17 - 21	17 - 25	17 - 06	02 - 6	DUP026	02 - 5	17 - 19	Trip Blank
		SAMPLE TYPE:		Water	Water	Water	Water	Water	Water	Water	Water
		DATE SAMPLED:		2018-02-27	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	2018-02-28	
Parameter	Unit	G / S	RDL	9094032	9094040	9094041	9094042	9094047	9094048	9094049	9094050
Bromoform	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Styrene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L		0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Xylene Mixture	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L		0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits									
Toluene-d8	% Recovery	50-140		93	94	105	85	90	92	91	92
4-Bromofluorobenzene	% Recovery	50-140		103	97	94	107	90	90	87	88

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

Certified By:

AGAT Laboratories
5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z315692
PROJECT: 1780158
ATTENTION TO: Alex Wood
SAMPLING SITE:
SAMPLED BY:

Trace Organics Analysis

RPT Date: Mar 07, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	9092559		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	82%	50%	140%	102%	50%	140%
Vinyl Chloride	9092559		< 0.17	< 0.17	NA	< 0.17	80%	50%	140%	119%	50%	140%	122%	50%	140%
Bromomethane	9092559		< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	103%	50%	140%	108%	50%	140%
Trichlorofluoromethane	9092559		< 0.40	< 0.40	NA	< 0.40	84%	50%	140%	98%	50%	140%	110%	50%	140%
Acetone	9092559		< 1.0	< 1.0	NA	< 1.0	123%	50%	140%	102%	50%	140%	109%	50%	140%
1,1-Dichloroethylene	9092559		< 0.30	< 0.30	NA	< 0.30	72%	50%	140%	104%	60%	130%	111%	50%	140%
Methylene Chloride	9092559		< 0.30	< 0.30	NA	< 0.30	102%	50%	140%	115%	60%	130%	98%	50%	140%
trans- 1,2-Dichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	107%	60%	130%	112%	50%	140%
Methyl tert-butyl ether	9092559		< 0.20	< 0.20	NA	< 0.20	100%	50%	140%	96%	60%	130%	110%	50%	140%
1,1-Dichloroethane	9092559		< 0.30	< 0.30	NA	< 0.30	95%	50%	140%	99%	60%	130%	111%	50%	140%
Methyl Ethyl Ketone	9092559		< 1.0	< 1.0	NA	< 1.0	118%	50%	140%	87%	50%	140%	85%	50%	140%
cis- 1,2-Dichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	76%	50%	140%	99%	60%	130%	94%	50%	140%
Chloroform	9092559		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	115%	60%	130%	112%	50%	140%
1,2-Dichloroethane	9092559		< 0.20	< 0.20	NA	< 0.20	102%	50%	140%	115%	60%	130%	117%	50%	140%
1,1,1-Trichloroethane	9092559		< 0.30	< 0.30	NA	< 0.30	71%	50%	140%	107%	60%	130%	104%	50%	140%
Carbon Tetrachloride	9092559		< 0.20	< 0.20	NA	< 0.20	72%	50%	140%	90%	60%	130%	89%	50%	140%
Benzene	9092559		< 0.20	< 0.20	NA	< 0.20	73%	50%	140%	85%	60%	130%	95%	50%	140%
1,2-Dichloropropane	9092559		< 0.20	< 0.20	NA	< 0.20	74%	50%	140%	87%	60%	130%	88%	50%	140%
Trichloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	96%	60%	130%	102%	50%	140%
Bromodichloromethane	9092559		< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	106%	60%	130%	105%	50%	140%
Methyl Isobutyl Ketone	9092559		< 1.0	< 1.0	NA	< 1.0	111%	50%	140%	78%	50%	140%	82%	50%	140%
1,1,2-Trichloroethane	9092559		< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	99%	60%	130%	109%	50%	140%
Toluene	9092559		< 0.20	< 0.20	NA	< 0.20	74%	50%	140%	94%	60%	130%	102%	50%	140%
Dibromochloromethane	9092559		< 0.10	< 0.10	NA	< 0.10	95%	50%	140%	107%	60%	130%	105%	50%	140%
Ethylene Dibromide	9092559		< 0.10	< 0.10	NA	< 0.10	103%	50%	140%	97%	60%	130%	105%	50%	140%
Tetrachloroethylene	9092559		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	104%	60%	130%	111%	50%	140%
1,1,1,2-Tetrachloroethane	9092559		< 0.10	< 0.10	NA	< 0.10	112%	50%	140%	105%	60%	130%	104%	50%	140%
Chlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	93%	50%	140%	107%	60%	130%	114%	50%	140%
Ethylbenzene	9092559		< 0.10	< 0.10	NA	< 0.10	71%	50%	140%	93%	60%	130%	99%	50%	140%
m & p-Xylene	9092559		< 0.20	< 0.20	NA	< 0.20	83%	50%	140%	103%	60%	130%	111%	50%	140%
Bromoform	9092559		< 0.10	< 0.10	NA	< 0.10	117%	50%	140%	111%	60%	130%	111%	50%	140%
Styrene	9092559		< 0.10	< 0.10	NA	< 0.10	73%	50%	140%	87%	60%	130%	94%	50%	140%
1,1,2,2-Tetrachloroethane	9092559		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	92%	60%	130%	103%	50%	140%
o-Xylene	9092559		< 0.10	< 0.10	NA	< 0.10	92%	50%	140%	109%	60%	130%	93%	50%	140%
1,3-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	96%	50%	140%	104%	60%	130%	109%	50%	140%
1,4-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	117%	50%	140%	116%	60%	130%	104%	50%	140%
1,2-Dichlorobenzene	9092559		< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	103%	60%	130%	109%	50%	140%
1,3-Dichloropropene	9092559		< 0.30	< 0.30	NA	< 0.30	78%	50%	140%	76%	60%	130%	76%	50%	140%
n-Hexane	9092559		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	109%	60%	130%	96%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis (Continued)

RPT Date: Mar 07, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)															
F1 (C6 to C10)	9094041	9094041	< 25	< 25	NA	< 25	84%	60%	140%	110%	60%	140%	96%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	96%	60%	140%	74%	60%	140%	68%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	94%	60%	140%	106%	60%	140%	102%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	81%	60%	140%	74%	60%	140%	85%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 to C10)	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC / FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC / FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z315692

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

1 Med

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Report Information:

Company: Golder Associates Ltd.
Contact: Alex Wood
Address: 1931 Robertson Rd

Phone: 613-592-9600 Fax: 592-9601
Reports to be sent to:
1. Email: Alex_Wood@golder.com
2. Email:

Project Information:

Project: 1780158 -
Site Location: 2525 Carling/Lincoln Fields Shopping
Sampled By: Kim MacDonald
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table ____ *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region ____ *Indicate One*
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
Indicate One

Is this submission for a **Record of Site Condition?** ☐ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☐ Yes ☐ No

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Laboratory Use Only

Work Order #: 18235692

Cooler Quantity: one
Arrival Temperatures: 9.2 | 9.2 | 8.8
86 | 83 | 79
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes: on ice

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI Y/N	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_2+NO_3	Volatiles: ☒ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☒ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
17-20	FEB 28	2:30PM	7	GW								X	X					
17-25	FEB 28	9:25AM	7	GW								X	X					
17-06	FEB 28	12:30	7	GW								X	X					
02-6	FEB 28	11:00	8	GW								X	X			X		
~~DUP~~ DUP026	FEB 28	11:00	7	GW								X	X					
02-5	FEB 28	10:15	8	GW								X	X			X		
17-19	FEB 28	1:00 PM	7	GW								X	X					

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
Kim MacDonald Kim MacDonald	FEB 28	4:15PM	(Bethelet)	28-Feb-18	16h15
CBS to FedEx 28Feb18	18/3/1	16h30	Sima	10 14	

Page 1 of 1

№: T 063383

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z322248

TRACE ORGANICS REVIEWED BY: Oksana Gushyla, Trace Organics Lab Supervisor

DATE REPORTED: Mar 27, 2018

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z322248

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)

DATE RECEIVED: 2018-03-21

DATE REPORTED: 2018-03-27

		SAMPLE DESCRIPTION:		17-1	17-21
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2018-03-21	2018-03-21
Parameter	Unit	G / S	RDL	9141608	9141609
F1 (C6 to C10)	µg/L	750	25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	750	25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500	NA	NA
Surrogate	Unit	Acceptable Limits			
Terphenyl	%	60-140		97	89

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

9141608-9141609 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z322248
PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD
SAMPLING SITE:Lincoln Fields

ATTENTION TO: Alex Wood
SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-03-21

DATE REPORTED: 2018-03-27

		SAMPLE DESCRIPTION:		17-1	17-21	Trip Blank
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-03-21	2018-03-21	2018-03-19
Parameter	Unit	G / S	RDL	9141608	9141609	9141610
Dichlorodifluoromethane	µg/L	4400	0.20	<0.20	<0.20	<0.20
Vinyl Chloride	µg/L	0.5	0.17	<0.17	<0.17	<0.17
Bromomethane	µg/L	5.6	0.20	<0.20	<0.20	<0.20
Trichlorofluoromethane	µg/L	2500	0.40	<0.40	<0.40	<0.40
Acetone	µg/L	130000	1.0	<1.0	<1.0	<1.0
1,1-Dichloroethylene	µg/L	1.6	0.30	<0.30	<0.30	<0.30
Methylene Chloride	µg/L	610	0.30	<0.30	<0.30	<0.30
trans- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20
Methyl tert-butyl ether	µg/L	190	0.20	<0.20	<0.20	<0.20
1,1-Dichloroethane	µg/L	320	0.30	<0.30	<0.30	<0.30
Methyl Ethyl Ketone	µg/L	470000	1.0	<1.0	<1.0	<1.0
cis- 1,2-Dichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20
Chloroform	µg/L	2.4	0.20	<0.20	<0.20	<0.20
1,2-Dichloroethane	µg/L	1.6	0.20	<0.20	<0.20	<0.20
1,1,1-Trichloroethane	µg/L	640	0.30	<0.30	<0.30	<0.30
Carbon Tetrachloride	µg/L	0.79	0.20	<0.20	<0.20	<0.20
Benzene	µg/L	44	0.20	<0.20	<0.20	<0.20
1,2-Dichloropropane	µg/L	16	0.20	<0.20	<0.20	<0.20
Trichloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20
Bromodichloromethane	µg/L	85000	0.20	<0.20	<0.20	<0.20
Methyl Isobutyl Ketone	µg/L	140000	1.0	<1.0	<1.0	<1.0
1,1,2-Trichloroethane	µg/L	4.7	0.20	<0.20	<0.20	<0.20
Toluene	µg/L	18000	0.20	7.3	<0.20	<0.20
Dibromochloromethane	µg/L	82000	0.10	<0.10	<0.10	<0.10
Ethylene Dibromide	µg/L	0.25	0.10	<0.10	<0.10	<0.10
Tetrachloroethylene	µg/L	1.6	0.20	<0.20	<0.20	<0.20
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.10	<0.10	<0.10	<0.10
Chlorobenzene	µg/L	630	0.10	<0.10	<0.10	<0.10
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	<0.10
m & p-Xylene	µg/L		0.20	<0.20	<0.20	<0.20

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z322248

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - VOCs (Water)

DATE RECEIVED: 2018-03-21

DATE REPORTED: 2018-03-27

		SAMPLE DESCRIPTION:		17-1	17-21	Trip Blank
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2018-03-21	2018-03-21	2018-03-19
Parameter	Unit	G / S	RDL	9141608	9141609	9141610
Bromoform	µg/L	380	0.10	<0.10	<0.10	<0.10
Styrene	µg/L	1300	0.10	<0.10	<0.10	<0.10
1,1,2,2-Tetrachloroethane	µg/L	3.2	0.10	<0.10	<0.10	<0.10
o-Xylene	µg/L		0.10	<0.10	<0.10	<0.10
1,3-Dichlorobenzene	µg/L	9600	0.10	<0.10	<0.10	<0.10
1,4-Dichlorobenzene	µg/L	8	0.10	<0.10	<0.10	<0.10
1,2-Dichlorobenzene	µg/L	4600	0.10	<0.10	<0.10	<0.10
1,3-Dichloropropene	µg/L	5.2	0.30	<0.30	<0.30	<0.30
Xylene Mixture	µg/L	4200	0.20	<0.20	<0.20	<0.20
n-Hexane	µg/L	51	0.20	<0.20	<0.20	<0.20
Surrogate	Unit	Acceptable Limits				
Toluene-d8	% Recovery	50-140		91	94	94
4-Bromofluorobenzene	% Recovery	50-140		87	86	85

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD
AGAT WORK ORDER: 18Z322248
PROJECT: 1780158
ATTENTION TO: Alex Wood
SAMPLING SITE:Lincoln Fields
SAMPLED BY:Aaron Bradshaw

Trace Organics Analysis

RPT Date: Mar 27, 2018

PARAMETER	Batch	Sample Id	DUPLICATE			Method Blank	REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
			Dup #1	Dup #2	RPD		Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (-BTEX) (Water)															
F1 (C6 to C10)	9141609		< 25	< 25	NA	< 25	108%	60%	140%	108%	60%	140%	110%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	98%	60%	140%	62%	60%	140%	64%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	97%	60%	140%	64%	60%	140%	71%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	84%	60%	140%	80%	60%	140%	96%	60%	140%
O. Reg. 153(511) - VOCs (Water)															
Dichlorodifluoromethane	9139726		< 0.20	< 0.20	NA	< 0.20	72%	50%	140%	93%	50%	140%	90%	50%	140%
Vinyl Chloride	9139726		< 0.17	< 0.17	NA	< 0.17	119%	50%	140%	117%	50%	140%	111%	50%	140%
Bromomethane	9139726		< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	74%	50%	140%	73%	50%	140%
Trichlorofluoromethane	9139726		< 0.40	< 0.40	NA	< 0.40	123%	50%	140%	112%	50%	140%	121%	50%	140%
Acetone	9139726		< 1.0	< 1.0	NA	< 1.0	101%	50%	140%	86%	50%	140%	98%	50%	140%
1,1-Dichloroethylene	9139726		< 0.30	< 0.30	NA	< 0.30	71%	50%	140%	87%	60%	130%	93%	50%	140%
Methylene Chloride	9139726		< 0.30	< 0.30	NA	< 0.30	89%	50%	140%	100%	60%	130%	113%	50%	140%
trans- 1,2-Dichloroethylene	9139726		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	97%	60%	130%	101%	50%	140%
Methyl tert-butyl ether	9139726		< 0.20	< 0.20	NA	< 0.20	77%	50%	140%	96%	60%	130%	100%	50%	140%
1,1-Dichloroethane	9139726		< 0.30	< 0.30	NA	< 0.30	82%	50%	140%	90%	60%	130%	94%	50%	140%
Methyl Ethyl Ketone	9139726		< 1.0	< 1.0	NA	< 1.0	114%	50%	140%	92%	50%	140%	88%	50%	140%
cis- 1,2-Dichloroethylene	9139726		< 0.20	< 0.20	NA	< 0.20	81%	50%	140%	98%	60%	130%	101%	50%	140%
Chloroform	9139726		< 0.20	< 0.20	NA	< 0.20	83%	50%	140%	94%	60%	130%	101%	50%	140%
1,2-Dichloroethane	9139726		< 0.20	< 0.20	NA	< 0.20	80%	50%	140%	88%	60%	130%	99%	50%	140%
1,1,1-Trichloroethane	9139726		< 0.30	< 0.30	NA	< 0.30	78%	50%	140%	93%	60%	130%	98%	50%	140%
Carbon Tetrachloride	9139726		< 0.20	< 0.20	NA	< 0.20	75%	50%	140%	91%	60%	130%	96%	50%	140%
Benzene	9139726		< 0.20	< 0.20	NA	< 0.20	77%	50%	140%	93%	60%	130%	95%	50%	140%
1,2-Dichloropropane	9139726		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	92%	60%	130%	92%	50%	140%
Trichloroethylene	9139726		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	96%	60%	130%	100%	50%	140%
Bromodichloromethane	9139726		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	94%	60%	130%	98%	50%	140%
Methyl Isobutyl Ketone	9139726		< 1.0	< 1.0	NA	< 1.0	88%	50%	140%	95%	50%	140%	97%	50%	140%
1,1,2-Trichloroethane	9139726		< 0.20	< 0.20	NA	< 0.20	97%	50%	140%	108%	60%	130%	114%	50%	140%
Toluene	9139726		< 0.20	< 0.20	NA	< 0.20	79%	50%	140%	103%	60%	130%	103%	50%	140%
Dibromochloromethane	9139726		< 0.10	< 0.10	NA	< 0.10	87%	50%	140%	105%	60%	130%	111%	50%	140%
Ethylene Dibromide	9139726		< 0.10	< 0.10	NA	< 0.10	85%	50%	140%	108%	60%	130%	116%	50%	140%
Tetrachloroethylene	9139726		< 0.20	< 0.20	NA	< 0.20	90%	50%	140%	109%	60%	130%	117%	50%	140%
1,1,1,2-Tetrachloroethane	9139726		< 0.10	< 0.10	NA	< 0.10	110%	50%	140%	103%	60%	130%	114%	50%	140%
Chlorobenzene	9139726		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	103%	60%	130%	111%	50%	140%
Ethylbenzene	9139726		< 0.10	< 0.10	NA	< 0.10	78%	50%	140%	95%	60%	130%	99%	50%	140%
m & p-Xylene	9139726		< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	92%	60%	130%	95%	50%	140%
Bromoform	9139726		< 0.10	< 0.10	NA	< 0.10	99%	50%	140%	101%	60%	130%	118%	50%	140%
Styrene	9139726		< 0.10	< 0.10	NA	< 0.10	84%	50%	140%	88%	60%	130%	92%	50%	140%
1,1,2,2-Tetrachloroethane	9139726		< 0.10	< 0.10	NA	< 0.10	89%	50%	140%	97%	60%	130%	104%	50%	140%
o-Xylene	9139726		< 0.10	< 0.10	NA	< 0.10	80%	50%	140%	96%	60%	130%	98%	50%	140%

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z322248

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

Trace Organics Analysis (Continued)

RPT Date: Mar 27, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
1,3-Dichlorobenzene	9139726		< 0.10	< 0.10	NA	< 0.10	79%	50%	140%	89%	60%	130%	96%	50%	140%
1,4-Dichlorobenzene	9139726		< 0.10	< 0.10	NA	< 0.10	85%	50%	140%	97%	60%	130%	103%	50%	140%
1,2-Dichlorobenzene	9139726		< 0.10	< 0.10	NA	< 0.10	83%	50%	140%	92%	60%	130%	99%	50%	140%
1,3-Dichloropropene	9139726		< 0.30	< 0.30	NA	< 0.30	87%	50%	140%	88%	60%	130%	102%	50%	140%
n-Hexane	9139726		< 0.20	< 0.20	NA	< 0.20	107%	50%	140%	106%	60%	130%	87%	50%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By:

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z322248

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
F1 (C6 to C10)	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC / FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC / FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC E3421	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Dichlorodifluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Vinyl Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromomethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichlorofluoromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Acetone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methylene Chloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
trans- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl tert-butyl ether	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Ethyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
cis- 1,2-Dichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chloroform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Carbon Tetrachloride	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Benzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichloropropane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Trichloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromodichloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Methyl Isobutyl Ketone	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2-Trichloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Dibromochloromethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylene Dibromide	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Tetrachloroethylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,1,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Chlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Ethylbenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
m & p-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Bromoform	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Styrene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,1,2,2-Tetrachloroethane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
o-Xylene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,4-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,2-Dichlorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
1,3-Dichloropropene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Xylene Mixture	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
n-Hexane	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
Toluene-d8	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS
4-Bromofluorobenzene	VOL-91-5001	EPA SW-846 5030 & 8260	(P&T)GC/MS

AGAT Laboratories

1 bk

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 18732248

Cooler Quantity: one on ice

Arrival Temperatures: 8.8 | 9.3 | 9.0
4.6 | 6.0 | 7.3 | 7.2

Custody Seal Intact: ☑ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: Golder
Contact: Alex Wood
Address: 1931 Robertson Rd. Ottawa, ON
Phone: 613-592-9600 Fax:
Reports to be sent to:
1. Email: alex_wood@golder.com
2. Email:

Regulatory Requirements:

☐ No Regulatory Requirement

Please check all applicable boxes)

*Ask Alex

☐ Regulation 153/04
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1780158
Site Location: Lincoln Fields
Sampled By: Aaron Bradshaw
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☑ Yes ☐ No

Report Guideline on *Certificate of Analysis* ☒ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI Y/N	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	O. Reg 153: Full Metals Scan	O. Reg 153: Regulation/Custom Metals	O. Reg 153: Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☒ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use						
17-1	18/03/21	10:00	4	GW								X	X							VOC							
17-21	18/03/21	8:30	3	GW								X	X														
Trip Blank			3																	X							

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Aaron Bradshaw	18/03/21			21-Mar-18	14h41
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
COB-Fed Ex	21-Mar-18	16h00			
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
			Shaunin	Mar 22/18	9:00 am

Page 1 of 1

№: T 068131

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD
1931 ROBERTSON ROAD
OTTAWA, ON K2H5B7
(613) 592-9600

ATTENTION TO: Alex Wood

PROJECT: 1780158

AGAT WORK ORDER: 18Z317884

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Mar 15, 2018

PAGES (INCLUDING COVER): 5

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18Z317884

PROJECT: 1780158

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

O. Reg. 153(511) - PCBs (Water)

DATE RECEIVED: 2018-03-07

DATE REPORTED: 2018-03-15

		SAMPLE DESCRIPTION:		MW02-6	DUP-P
		SAMPLE TYPE:		Water	Water
		DATE SAMPLED:		2018-03-07	2018-03-07
Parameter	Unit	G / S	RDL	9107005	9107006
Polychlorinated Biphenyls	µg/L	7.8	0.1	<0.1	<0.1
Surrogate	Unit	Acceptable Limits			
Decachlorobiphenyl	%	60-140		90	86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: N Popowkolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z317884

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

Trace Organics Analysis

RPT Date: Mar 15, 2018			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PCBs (Water)															
Polychlorinated Biphenyls	TW		< 0.1	< 0.1	NA	< 0.1	107%	60%	140%	98%	60%	140%	90%	60%	140%

Comments: Tap water analysis has been performed as QC sample testing for duplicate and matrix spike due to insufficient sample volume.
When the average of the sample and duplicate results is less than 5x the RDL, the Relative Percent Difference (RPD) will be indicated as Not Applicable (NA).

Certified By: N Popnikolof

AGAT Laboratories

5835 COOPERS AVENUE
MISSISSAUGA, ONTARIO
CANADA L4Z 1Y2
TEL (905)712-5100
FAX (905)712-5122
http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

AGAT WORK ORDER: 18Z317884

PROJECT: 1780158

ATTENTION TO: Alex Wood

SAMPLING SITE:Lincoln Fields

SAMPLED BY:Aaron Bradshaw

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Polychlorinated Biphenyls	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD
Decachlorobiphenyl	ORG-91-5112	EPA SW-846 3510 & 8082	GC/ECD

AGAT Laboratories

1 small ice pack

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water consumed by humans)

Laboratory Use Only
Work Order #: 1873178 84

Cooler Quantity: one - on ice
Arrival Temperatures: 14.0 | 14.0 | 14.1
LT - 8.3 | 8.9 | 8.1
Custody Seal Intact: ☐Yes ☐No ☐N/A
Notes:

Report Information:
Company: Golder
Contact: Alex Wood
Address: 1931 Robertson Rd Ottawa, ON
Phone: 613-592-9600 Fax:
Reports to be sent to:
1. Email: alex-wood@golder.com
2. Email:

Project Information:
Project: 1780158
Site Location: Lincoln Fields
Sampled By: Aaron Bradshaw
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:
Bill To Same: Yes ☒ No ☐
Company:
Contact:
Address:
Email:

Regulatory Requirements:
(Please check all applicable boxes) ☐ No Regulatory Requirement

☒ Regulation 153/04
Table 3 (Indicate One)
☐ Ind/Com
☒ Res/Park
☐ Agriculture
Soil Texture (Check One)
☒ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm
Region (Indicate One)
☐ MISA

☐ Regulation 558
☐ CCME
☐ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Is this submission for a Record of Site Condition? ☒ Yes ☐ No

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:
Regular TAT ☒ 5 to 7 Business Days
Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day
OR Date Required (Rush Surcharges May Apply):
Please provide prior notification for rush TAT
**TAT is exclusive of weekends and statutory holidays*
For 'Same Day' analysis, please contact your AGAT CPM

Sample Matrix Legend
B Biota
GW Ground Water
O Oil
P Paint
S Soil
SD Sediment
SW Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4	ABNs	PAHs	PCBs: ☒ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
MW02-6	18/03/07	9:10	1	GW		N									X			
DUP-P	18/03/07	9:20	1	GW		N									X			

Samples Relinquished By (Print Name and Sign): Aaron Bradshaw — Date 18/03/07 — Time 11:00
Samples Relinquished By (Print Name and Sign): (B&D) to FedEX — Date 7-Mar-18 — Time 16h00
Samples Relinquished By (Print Name and Sign): — Date — Time

Samples Received By (Print Name and Sign): Obenhelet — Date 7-Mar-18 — Time 10h59
Samples Received By (Print Name and Sign): — Date — Time
Samples Received By (Print Name and Sign): Shaunin — Date Mar 8/18 — Time 9:10 am

Page 1 of 1
Nº: T 067830 ✓

Pink Copy - Client | Yellow Copy - AGAT | White Copy- AGAT

golder.com