October 2017

REPORT ON



Phase II Environmental Site Assessment **Proposed Residential Development of Riverside South Lands Between River Road and Spratt Road** and East of 805-809 River Road Ottawa, Ontario

Submitted to: **Claridge Homes Corporation** 2001 - 210 Gladstone Avenue Ottawa, Ontario K2P 0Y6

EPORT

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Executive Summary

Golder Associates Ltd. (Golder) was retained by Claridge Homes Corporation (Claridge) to conduct a Phase II Environmental Site Assessment (Phase II ESA) on part of the property located in the Riverside South Development Lands, between River Road and Spratt Road and east of 805-809 River Road, Ottawa, Ontario (hereinafter collectively referred to as the "Site"), as shown on the attached Figures 1 and 2. The Phase II ESA was undertaken on a one hectare section of land located on the western end of the proposed development lands.

Based on the soil analytical results, three areas of contaminated soil were identified at the Site as follows and as shown on Figure 2:

- The fill material located to the north of the farm/maintenance compound contains petroleum hydrocarbon (PHC) fraction F3 impacts above the applicable site standards. These PHC impacts were identified in the analyzed fill samples from borehole 17-8 and test pits TP17-01 through TP17-04. As shown on Figure 2, the northern and eastern extent of this area of impacted fill is delineated by the locations of test pits TP17-01 and TP17-02 which were completed at the very edge of the fill in these directions. The western edge likely extends to the Site boundary in the westward direction. The southern limit extends south beyond test pit TP17-04. Although not tested, the next borehole 17-33 did contain documented asphalt fragments and as such there is the potential that the impacts extend further south, however, the fill layer further south (as observed in boreholes 17-33, 17-32 and 17-29) is much thinner that than in the area of documented impacts. Based on the average thickness of the fill material in this area (approximately 0.5 metres), the volume of PHC impacted fill in this area is approximately 1,200 cubic metres (m³). This material should be removed from the Site during redevelopment.
- Electrical conductivity (EC) and/or sodium adsorption ratio (SAR) concentrations above the applicable site standard were identified in the native clay samples collected from the vicinity of the salt storage shed (specifically boreholes 17-30, 17-31 and 17-32 and test pits TP17-05 and TP17-07). Given that the native clay sample collected from borehole 17-8 located north of the farm/maintenance compound satisfied the MOE Table 3 Standards for these parameters, the elevated concentrations of EC and SAR in the vicinity of the salt storage shed are inferred to be road salt impacts. Given that these impacts were not found in the remaining boreholes and test pits, the EC and/or SAR impacted soil in this area is inferred to extend midway to the next cleanest boreholes/test pits and likely is present along the driveway of the farm/maintenance compound as shown on Figure 2. The total area of salt impacted soil is 2,000 metres squared (m²); however, the vertical extent of the salt impacted soil in not known as it was present in the deepest soil sample collected from a depth of 3.0 metres below ground surface at test pit TP17-05. Soil from this area should be removed from the upper 1.5 metres of the final site development grade in residential areas or reused in road allowances where it would be subject to continued road salt application.
- The fill pile located on the southern portion of the farm/maintenance compound contains PHC F3 and F4 impact above the MOE Table 3 Standards. Given that all four soil samples collected from this fill pile contained hydrocarbon impacts, the entire pile of fill (approximately 450 m³) is inferred to contain PHC impacts. This material should be removed from the Site during redevelopment.





It is also noted that salt-related impacts, specifically chloride, were identified in the groundwater in the vicinity of salt storage shed (monitoring well 17-30). This salt impacted groundwater is not anticipated to extend beyond the area of the salt impacted soil at the Site and is not anticipated to represent a concern for the proposed development. In addition, the groundwater in the vicinity of the fuel ASTs (monitoring well 17-31) contained PHC F4 impacts above the applicable site standards. Given that hydrocarbon impacts were not identified in the soil samples collected from this borehole or the test pits completed in this area and the groundwater samples collected from the adjacent monitoring wells 17-29 and 17-30 did not contain detectable PHCs, the lateral extent of PHC impacted groundwater is inferred to be localized to the vicinity of monitoring well 17-31 and is inferred to be the result historical Site activities or leaching from the hydrocarbon impacted fill on the Site. It is likely that removal of the hydrocarbon impacted fill from the Site and discontinuation of fuelling/vehicle maintenance on the Site will improve the groundwater quality in this area.





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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Claridge Homes Corporation (Claridge) to conduct a Phase II Environmental Site Assessment (Phase II ESA) on part of the property located in the Riverside South Development Lands, between River Road and Spratt Road and east of 805-809 River Road, Ottawa, Ontario (hereinafter collectively referred to as the "Site"), as shown on the attached Figures 1 and 2. The Phase II ESA was undertaken on a one hectare section of land located on the western end of the proposed development lands.

The Phase II ESA was initiated in January 2017 and was completed following recommendations to conduct a Phase II ESA in Golder's Phase I ESA report dated January, 2017, entitled "*Phase One Environmental Site Assessment, Riverside South Lands Proposed Development Ottawa, Ontario*", Report No. 1658448. This Phase II ESA investigation was conducted for due diligence purposes.

The Phase II ESA was completed in general accordance with Canadian Standards Association (CSA) Standard Z769-00 (R2013), *Phase II Environmental Site Assessment* for the purpose of identifying contaminants of potential concern that may be present at concentrations exceeding the applicable regulatory criteria.

1.1 Background and Site Description

The Site is located in the Riverside South Development Lands, between River Road and Spratt Road and east of 805-809 River Road, Ottawa, Ontario and consists of a 96 acre parcel partially used for agricultural crop production and farm equipment/vehicle maintenance, and partially vacant. Historically, the Site has been used solely for agricultural purposes since at least 1965; however, some vehicle maintenance occurred in the area of the farm/maintenance compound which is located on the westernmost portion of the Site, just east of 805 River Road. Within this area are the following four structures: a farm equipment maintenance shop/garage that encroaches the Site but is not entirely located on the property, a salt storage shed, a small wooden storage shed and an out-of-service silo.

A Phase I ESA was completed for the Site by Golder in December 2016. Based on the information obtained during the Phase I ESA, the following issues of potential environmental concern related to potential impacts to soil and/or groundwater were identified:

- Current presence of a maintenance shop/garage where fueling of farm equipment has taken place. It is located immediately west of the Site at 805 River Road and encroached on the western portion of the Site.
- Current presence of road salt stored in a salt storage shed located within the farm/maintenance compound on the westernmost portion of the Site, to the east of the maintenance shop/garage.
- Current presence of six diesel and/or gasoline aboveground storage tanks (ASTs) on the Site in the farm/maintenance compound, between the maintenance shop/garage and the salt storage shed.
- Current presence of a burn bin in which waste is burned located in the farm/maintenance compound, on the east side of the salt storage shed.
- Current presence of a stockpile of fill material on the eastern portion of the farm/maintenance compound, east of the salt storage shed (hereinafter referred to as "Fill Pile 1").
- Current presence of a stockpile of fill material on the southernmost portion of the farm/maintenance compound (hereinafter referred to as "Fill Pile 2").
- Historical activities occurring on-Site in the general farm/maintenance compound, including the potential for fill to be have placed elsewhere on the Site than the two current fill piles.

In order to address the above issues of potential environmental concern, a Phase II ESA was completed at the Site.



1.2 Scope of Investigation

The Phase II ESA was completed in two stages. In conjunction with the geotechnical and hydrogeological investigation, Golder carried out the first stage of the Phase II ESA at select boreholes, identified as geoenvironmental boreholes on the Detailed Site Plan (Figure 2), to address the issues of potential environmental concern flagged in the Phase I ESA and as summarized in below. A second stage of investigation was subsequently carried out to delineate impacts in soil that were identified in the first stage of the Phase II ESA.

The first stage of the Phase II ESA included the following scope of work:

- Collection of soil samples from eight geo-environmental boreholes (see Figure 2) at regular depth intervals during drilling for visual characterization, headspace screening of organic vapours and potential laboratory analysis;
- Analysis of one soil sample from each borehole for petroleum hydrocarbon fractions F1- F4 (PHCs F1-F4), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), volatile organic compounds (VOCs), electrical conductivity (EC) and/or sodium adsorption ratio (SAR) to evaluate the soil quality at the Site;
- Collection and laboratory analysis of one sample of fill from each of the two fill piles located in the farm/maintenance compound. Laboratory analysis on these samples included PHCs F1-F4, BTEX, PAHs and metals;
- Completion of the three boreholes (boreholes 17-29, 17-30 and 17-31) as monitoring wells (hereinafter referred to as monitoring wells 17-29, 17-30 and 17-31, respectively);
- Collection of one groundwater sample from each of the three monitoring wells for submission to an accredited laboratory for analysis of PHCs F1-F4, BTEX, PAHs, VOCs and/or dissolved metals; and,
- An elevation survey of borehole and monitoring well locations using a Trimble R8 to a geodetic benchmark.

The second stage of the Phase II ESA included the following scope of work:

- Advancement of test pits (test pits TP17-01 through TP17-10, inclusively, as shown on Figure 2) to depths ranging between 0.75 metres below ground surface (mbgs) and 3.1 mbgs;
- Collection of soil samples from each test pit for visual characterization, headspace screening of organic vapours and potential laboratory analysis;
- Analysis of one soil samples from each test pit for PHCs F1-F4, BTEX, EC and/or SAR;
- Collection and laboratory analysis of three samples of fill from the fill pile located on the southern portion of the farm/maintenance compound where previous PHC impacts were identified. Laboratory analysis on these samples included PHCs F1-F4;
- Collection of one duplicate soil sample for analyses of the PHCs F1-F4, BTEX, EC and SAR for Quality Assurance and Quality Control (QA/QC); and,
- Interpretation of the results and preparation of this report.





The rationale for the investigation locations are presented in Table 1 below.

First Stage of Phase II ESA							
Borehole/ Monitoring Well	Rationale						
17-8	Assessment of fill quality and analysis of native soil to determine background concentrations of EC and SAR.						
17-29	Characterization of soil and groundwater related to the current maintenance shop/garage, fuel ASTs and historical activities occurring in the general farm/maintenance compound.						
17-30	Characterization of soil and groundwater related to the current salt storage and fuel ASTs.						
17-31	Characterization of soil and groundwater related to the current fuel ASTs, salt storage and/or historical activities occurring in the general farm/maintenance compound.						
17-32	Characterization of soil and groundwater related to the current burn bin and salt storage.						
17-33	Characterization of soil and groundwater related to the current maintenance shop/garage, fuel ASTs and historical activities occurring in the general farm/maintenance compound.						
17-34 ⁽¹⁾	Visual characterization and headspace screening of organic vapours of soil samples to identify any potential soil contamination related to the historical activities occurring in the general farm/maintenance compound.						
17-35 ⁽¹⁾	Visual characterization and headspace screening of organic vapours of soil samples to identify any potential soil contamination related to the historical activities occurring in the general farm/maintenance compound.						
Fill Pile 1	Assessment of fill quality.						
Fill Pile 2	Assessment of fill quality.						

Table 1: Investigation Rationale





Table 1: Investigation Rationale

	Second Stage of Phase II ESA							
Test Pit	Rationale							
TP17-01	Lateral delineation of PHC impacted fill that was identified in borehole 17-8							
TP17-02	located on the northern portion of the farm/maintenance compound. TP17-01 was completed at the northern extent of the fill in this location and TP17-02 was							
TP17-03	completed at the eastern extent of fill in this location. The soil sample submitted from TP17-04 was also submitted for lateral							
TP17-04	delineation of EC and SAR impacts that were identified in the vicinity of the salt storage shed.							
TP17-05	Characterization of soil related the current presence of fuel ASTs and associated							
TP17-06	hydrocarbon impacts in groundwater as well as the lateral delineation of EC and SAR impacts that were identified in the vicinity of the salt storage shed. A deeper							
TP17-07	soil samples was also submitted from TP17-05 for vertical delineation of EC and SAR impacts.							
TP17-08								
TP17-09	Lateral delineation of EC and SAR impacts that were identified in the vicinity of the salt storage shed.							
TP17-10								
Fill Pile 2	Further assessment of fill quality due to the presence of PHC impacts in the sample of fill collected during the first stage to the Phase II ESA.							

(1) No soil samples were submitted for laboratory analysis from this borehole due to the absence of field evidence of impacts

2.0 APPLICABLE SITE CONDITION STANDARDS

The soil and groundwater analytical results obtained for this Phase II ESA were compared to the standards for a potable groundwater condition presented in the Ontario Ministry of the Environment and Climate Change's (MOE's) "*Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act*", dated April 15, 2011 (MOE 2011a). The following was considered in selecting the applicable standards:

- The Site is currently used for agricultural crop production and farm equipment/vehicle maintenance and is partially vacant; however, Site is to be redeveloped with a residential subdivision and as such, the standards for residential land uses have been selected;
- The Site is to be redeveloped with residential buildings supplied with municipal water. As such, non-potable groundwater conditions have been selected;
- The Site is not an environmentally sensitive site as defined by Section 41, Part IX, Ontario Regulation (O.Reg.) 153/04;





- The nearest water body is Rideau River located approximately 400 m west of the Site. As such, the Site is not located within 30 m of a water body;
- The thickness of overburden encountered during borehole drilling on-Site completed as part of the Phase II ESA was greater than 2 m; and,
- The standards for coarse-textured soil was selected as most of the impacts were located within the coarse grained upper fills.

Based on the above, the applicable standards are considered to be the MOE Table 3 Standards, Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition for coarse-textured soil and Residential/Parkland/Institutional property use.

3.0 METHODOLOGY AND INVESTIGATIVE TECHNIQUES

The following sections describe the pre-field work activities and field investigation methodology employed during the Phase II ESA conducted at the Site. The field work was conducted between January 6, 2017 and July 21, 2017.

Prior to initiating the fieldwork, Golder developed and implemented site-specific protocols to protect the health and safety of its employees, its subcontractors and the environment through a Site-specific Health, Safety and Environmental Plan. Prior to any intrusive investigations, Golder arranged for the completion of public and private utility clearances.

3.1 Borehole Drilling and Soil Sampling

As part of the geotechnical investigation completed for the Site, 35 boreholes (numbered boreholes 17-1 through 17-35, inclusively) were advanced on the Site as shown on Figure 1. The boreholes were advanced to depths ranging from 2.13 to 8.22 metres below ground surface (mbgs). For the purpose of the Phase II ESA report, only the boreholes within the investigation area (Figure 2) are discussed herein.

All boreholes were advanced by CCC Geotechnical and Environmental Drilling of Ottawa, Ontario using a CME-850 track-mounted drill rig. All intrusive investigations were monitored in the field by Golder field personnel. During borehole drilling activities, overburden soil samples were recovered at regular depth intervals (0.75 m) using split spoon soil sampling equipment and augers using 200 mm outside diameter (OD) hollow stem augers.

All soil samples were logged as to soil type, texture, moisture content, presence of staining, odour and debris, if any. Field observations made during the borehole drilling activities are summarized in the Record of Borehole sheets provided in Appendix A. Soil samples were collected into laboratory supplied bottles, placed in coolers with ice, and where recovered soil volumes permitted, additional bagged samples were collected for soil vapour headspace readings, which were conducted in the field using a MiniRAE 3000 Photoionization detector (PID).

Based on field observations and soil headspace organic vapour measurements, one to two soil samples from each geo-environmental borehole were submitted under chain of custody documentation for laboratory analysis of PHCs F1- F4, BTEX, PAHs, VOCs, EC and/or SAR with the exception of boreholes 17-34 and 17-35 from which no soil samples were submitted for laboratory analysis given that these boreholes due to the absence of field evidence of hydrocarbon impacts.





3.2 Test Pit Excavation and Soil Sampling

Ten test pits (TP 17-01 to TP 17-10) were excavated on the Site for environmental purposes on July 21, 2017. The 10 test pits were excavated to depths ranging from 0.75 to 3.1 metres below ground surface (mbgs).

The approximate location of the test pits is shown on Figure 2.

Soil samples were collected from each of the test pits completed on the Site. The samples were retrieved directly from the excavator bucket using a clean, gloved hand at regular depth intervals (approximately every 0.5 to 1 m), from the different fill and soil layers, and/or from visually impacted soil layers (if observed).

Each soil sample collected from the ten test pits was logged in the field, placed in laboratory supplied glass sample jars and refrigerated until selected samples were delivered to the laboratory for analysis. Representative portions of each soil sample were collected in sealed plastic bags for organic vapour screening using a calibrated MiniRae 2000 PID.

3.3 Monitoring Well Installation

Monitoring wells were completed at three of the geo-environmental boreholes (boreholes 17-29, 17-30 and 17-31) by installing 1.5 m long screen (51 millimetre (mm) slotted schedule 40 PVC screens) and solid riser. The annular space from the base of the screen to up to approximately 0.3 m above the screen was backfilled with silica sand. A bentonite seal was placed from the top of the sand pack to approximately 0.3 to 0.6 below ground surface above which silica sand was placed up to ground surface. All monitoring wells were completed with flush mount style protective casings. The riser pipes were sealed with a protective cap. Standpipes were also installed in boreholes 17-1, 17-3, 17-9, 17-14A, 17-18A, 17-21, 17-24A, 17-27, 17-28 for hydrogeological purposes and are discussed under separate cover.

3.4 **Groundwater Sampling**

Following monitoring well installation, the water levels in each monitoring well were measured and each monitoring well was equipped with dedicated low density polyethylene (LDPE) tubing and inertial footvalves. Groundwater samples collected from each monitoring well were collected using the inertial samples. All groundwater samples were collected directly into laboratory supplied bottles and vials, placed in coolers with ice, and submitted to for laboratory analysis of PHCs F1-F4, BTEX, PAHs and/or VOCs.

3.5 Sampling Location Survey

The locations and elevations of the boreholes and monitoring wells were surveyed using a Trimble R8 to a geodetic benchmark.

4.0 **RESULTS**

4.1 Geology and Soil Stratigraphy

Eight boreholes were advanced at the Site as part of the Phase II ESA to depths ranging between 2.13 to 5.94 mbgs and ten test pits were completed to depths ranging between 0.75 and 3.1 mbgs. As previously discussed, an additional 27 boreholes were drilled elsewhere on the development site for geotechnical purposes.





In general, the subsurface conditions across this Site consist of surficial layers of topsoil, fill, and silty sand. The surficial soils across the majority of the Site are underlain by a deposit of weathered silty clay, clayey silt, and silty sand, which is underlain by unweathered silty clay and/or glacial till. No bedrock was encountered within the Phase II ESA investigation area.

Headspace readings obtained as part of the borehole drilling and test pitting programs ranged from 0.1 parts per million (ppm) (in soil sample TP17-09 SA1 and soil sample FB2 SA3 collected from Fill Pile 2) to 8.1 (in soil sample 17-32 SA2) using the PID.

During drilling, asphaltic concrete fragments were observed in the fill material at boreholes 17-8 and 17-31 and the fill material at boreholes 17-29 and 17-33 was described as asphaltic concrete. Pieces of asphalt were also observed in the fill material at test pits TP17-01, TP1-7-02, TP17-03 and TP17-04 (i.e., the test pits that were completed surrounding borehole 17-8) and pieces of wood, concrete, brick and plastic were also observed in the fill at test pit TP17-03. In addition, black staining was observed in the uppermost portion of the native silty clay lavers at boreholes 17-29 and 17-33. No obvious visual or olfactory evidence of environmental impact (i.e., hydrocarbon odours and/or staining) was noted in any of the remaining boreholes.

4.2 Hydrogeological Conditions

The following groundwater elevations in relation to geodetic benchmark were measured on January 30, 2017:

Location	Water Level (mbgs)	Groundwater Elevation (m)							
17-29	89.5	90.2							
17-30	89.4	90.0							
17-31	89.4	90.1							

Table 2: Groundwater Levels and Elevations

Notes:

mbgs: metres below ground surface

Based on the hydrogeological study of the entire Site, local groundwater flow is interpreted to be west/southwest towards the Rideau River.

No hydrocarbon sheens or odour were detected in the monitoring wells during groundwater sampling.

EVALUATION OF RESULTS 5.0

5.1 Soil

The following soil samples were submitted for laboratory analysis, based on field observations, soil headspace screening measurements, changes in stratigraphy and targeted depth intervals:

Table 3: Soil Quality Samples									
Sample Location	Sample Name	Soil Type	Analyses						
		First Stage	of Phase II ESA						
17-8	BH17-8 SA1	0 – 0.41	Fill (sand and gravel, contains asphaltic concrete fragments)	PHCs F1-F4, BTEX, PAHs and metals					
17-8	BH17-8 SA7	4.42 - 5.03	Silty clay	EC and SAR					





Sample		Sample Depth		
Location	Sample Name	(mbgs)	Soil Type	Analyses
17-29	BH17-29 SA2	0.46 – 0.76	Sandy silty	PHCs F1-F4, BTEX, PAHs, VOCs and metals
17-30	BH17-30 SA2	0.76 – 1.37	Silty clay to clay	PHC F1-F4, BTEX, EC and SAR
17-31	BH17-31 SA2	0.76 – 1.37	Silty clay to clay	PHC F1-F4, BTEX, EC and SAR
17-32	BH17-32 SA2	0.76 – 1.37	Silty clay to clay	PHCs F1-F4, BTEX, PAHs, metals, EC and SAR
17-33	BH17-33 SA3 ⁽¹⁾	0.76 – 1.37	Silty clay to clay	PHCs F1-F4, BTEX, PAHs, VOCs and metals
Fill Pile 1	FP1 SA1	N/A	Sill sand to sandy silt with trace gravel, come organics and occasional chunks of concrete	PHCs F1-F4, BTEX, PAHs and metals
Fill Pile 2	FP2 SA2	N/A	Sand and gravel with asphalt grindings and asphalts chunks.	PHCs F1-F4, BTEX, PAHs and metals
		Second Stag	ge of Phase II ESA	
TP17-01	TP17-1 SA1	0.15 – 0.30	Fill (gravelly sand, contains asphalt)	PHCs F1-F4, BTEX
TP17-02	TP17-2 SA1	0.35 – 0.50	Fill (gravelly sand, contains asphalt)	PHCs F1-F4, BTEX
TP17-03	TP17-3 SA1	0.07 – 0.47	Fill (gravelly sand, contains asphalt, concrete, brick and plastic)	PHCs F1-F4, BTEX
TP17-04	TP17-4 SA1	0.20 – 0.40	Fill (gravelly sand, contains asphalt)	PHCs F1-F4, BTEX, EC and SAR
	TP17-5 SA3	2.80 - 3.0	Silty clay to clay	PHCs F1-F4, BTEX, EC and SAR
TP17-05	TP17-5 SA13 (Duplicate of TP17-5 SA3)	2.80 - 3.0	Silty clay to clay	PHCs F1-F4, BTEX, EC and SAR
TP17-06	TP17-6 SA1	0.90 – 0.95	Silty clay to clay	PHCs F1-F4, BTEX, EC and SAR
TP17-07	TP17-7 SA2	1.80 – 1.90	Silty clay to clay	PHCs F1-F4, BTEX, EC and SAR
TP17-08	TP17-8 SA1	0.90 – 1.0	Silty clay to clay	EC and SAR
TP17-09	TP17-9 SA3	2.80 - 3.0	Silty clay to clay	EC and SAR
TP17-10	TP17-10 SA1	0.90 – 1.0	Silty clay to clay	EC and SAR
	FB2 SA1	N/A	Sand and gravel with asphalt grindings and asphalts chunks.	PHCs F1-F4 and BTEX
Fill Pile 2	FB2 SA2	N/A	Sand and gravel with asphalt grindings and asphalts chunks.	PHCs F1-F4 and BTEX
	FB2 SA3	N/A	Sand and gravel with asphalt grindings and asphalts chunks.	PHCs F1-F4 and BTEX

Table 3: Soil Quality Samples

(1) Sample ID on Laboratory Certificates of Analysis is BH17-33 SA2.



The soil analytical results compared to the applicable standards (MOE Table 3) are provided in Tables 5a, 5b, 5c and 5d following the test of this report. The soil analytical results indicated the following:

- The sample of fill collected from borehole 17-8 located north of the farm/maintenance compound had an exceedance of the MOE Table 3 Standard for PHCs F3 (1,100 ug/g) relative to the criteria of 300 ug/g. The samples of fill collected from test pits TP17-01, TP17-02, TP17-03 and TP17-04 (i.e., surrounding borehole 17-8) also contained exceedances of the MOE Table 3 Standards for PHC F3 with concentrations detected between 560 and 2,300 ug/g vs the standard of 300 ug/g.
- The native clay samples collected from the borehole completed at the salt storage shed (borehole 17-30) as well as the boreholes completed east and west of the salt storage shed (boreholes 17-32 and 17-31, respectively) contained concentrations of salt-related impacts (EC and/or SAR) above the MOE Table 3 Standards. EC and/SAR also exceeded of the applicable site standards in the native soil samples collected from test pits TP17-05 and TP17-07; however, exceedances of these parameters were not found in the remaining test pits. Additionally, the native clay sample collected from borehole 17-8, furthest from the salt storage shed, satisfied the MOE Table 3 Standards for EC and SAR.
- The soil sample collected from Fill Pile 2 (located on the southern portion of the farm/maintenance compound) during the first stage of the Phase II ESA as well as the three soil samples collected from this fill pile during the second stage of the Phase II ESA all had exceedances of the MOE Table 3 Standards for PHC F3. One of these samples collected during the second stage of the Phase II ESA all had exceedances II ESA also had a concentration of PHC F4 above the MOE Table 3 Standard.
- The soil samples collected from boreholes 17-29 and 17-33, test pits TP17-06, TP17-08, TP17-09 and TP17-10 as well as the soil samples collected from Fill Pile 1 did not have any exceedances of the MOE Table 3 Standards for the parameters analyzed.

5.2 Groundwater

The following groundwater samples were submitted for laboratory analysis as part of the first stage of the Phase II ESA:

Sample Location	Sample Name	Screened Unit	Analysis
17-29	MW #17-29	Silty clay to clay	PHCs F1-F4, BTEX, PAHs, VOCs and metals,
17-30	MW #17-30	Silty clay to clay	PHCs F1-F4, BTEX, sodium and chloride
17-31	MW #17-31	Silty clay to clay	PHCs F1-F4 and BTEX

Table 4: Groundwater Quality Samples



The groundwater analytical results compared to the applicable standards (MOE Table 3) are provided in Tables 6a, 6b and 6c following the text of the report. The groundwater sample collected from monitoring well 17-30 had an exceedance of chloride (4,200,000 ug/L) compared to the MOE Table 3 Standard of 2,300,000 ug/L and the groundwater sample collected from monitoring well 17-31 had an exceedance of the PHC F4 (600 ug/L) compared to the MOE Table 3 Standard of 500 ug/L. These groundwater samples satisfied the MOE Table 3 Standards for the remaining parameters analyzed and the groundwater sample collected from monitoring well 17-29 satisfied the applicable site standards for all parameters analyzed.

5.3 Quality Assurance and Quality Control

One duplicate soil sample was collected from test pit TP17-05 (original sample TP17-05 SA3 and duplicate sample TP17-05 SA13) and submitted for analysis of PHCs F1-F4, BTEX and inorganics (specifically EC and SAR).

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

Where

 $RPD = \frac{|x_1 - x_2|}{x_m}$ x₁ initial sample results x₂ duplicate sample results x_m mean of x₁, x₂

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 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 the MOE 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): RPDs in soil, 30% for metals and inorganics and 30% for PHCs/BTEX.

RPDs could not be calculated for PHCs, BTEX, EC and SAR in the original and duplicate soil samples, as these results were below the laboratory RDL or less that ten times greater than the RDL.

Based on the review of field QA/QC measures, Golder considers the data obtained during the Phase II ESA investigation described herein to be reliable and representative of Site conditions at the time of the investigation.





6.0 SUMMARY AND CONCLUSIONS

Based on the soil analytical results, three areas of contaminated soil were identified at the Site as follows and as shown on Figure 2:

- The fill material located to the north of the farm/maintenance compound contains PHC F3 impacts above the applicable site standards. These PHC impacts were identified in the analyzed fill samples from borehole 17-8 and test pits TP17-01 through TP17-04. As shown on Figure 2, the northern and eastern extent of this area of impacted fill is delineated by the locations of test pits TP17-01 and TP17-02 which were completed at the very edge of the fill in these directions. The western edge likely extends to the Site boundary in the westward direction. The southern limit extends south beyond test pit TP17-04. Although not tested, the next borehole 17-33 did contain documented asphalt fragments and as such there is the potential that the impacts extend further south, however, the fill layer further south (as observed in boreholes 17-33, 17-32 and 17-29) is much thinner that than in the area of documented impacts. Based on the average thickness of the fill material in this area (approximately 0.5 metres), the volume of PHC impacted fill in this area is approximately 1,200 cubic metres (m³). This material should be removed from the Site during redevelopment.
- EC and/or SAR concentrations above the applicable site standard were identified in the native clay samples collected from the vicinity of the salt storage shed (specifically boreholes 17-30, 17-31 and 17-32 and test pits TP17-05 and TP17-07). Given that the native clay sample collected from borehole 17-8 located north of the farm/maintenance compound satisfied the MOE Table 3 Standards for these parameters, the elevated concentrations of EC and SAR in the vicinity of the salt storage shed are inferred to be road salt impacts. Given that these impacts were not found in the remaining boreholes and test pits, the EC and/or SAR impacted soil in this area is inferred to extend midway to the next cleanest boreholes/test pits and likely is present along the driveway of the farm/maintenance compound as shown on Figure 2. The total area of salt impacted soil is 2,000 metres squared (m²); however, the vertical extent of the salt impacted soil in not known as it was present in the deepest soil sample collected from a depth of 3.0 mbgs at test pit TP17-05. Soil from this area should be removed from the upper 1.5 metres of the final site development grade in residential areas or reused in road allowances where it would be subject to continued road salt application.
- The fill pile located on the southern portion of the farm/maintenance compound contains PHC F3 and F4 impact above the MOE Table 3 Standards. Given that all four soil samples collected from this fill pile contained hydrocarbon impacts, the entire pile of fill (approximately 450 m³) is inferred to contain PHC impacts. This material should be removed from the Site during redevelopment.

It is also noted that salt-related impacts, specifically chloride, were identified in the groundwater in the vicinity of salt storage shed (monitoring well 17-30). This salt impacted groundwater is not anticipated to extend beyond the area of the salt impacted soil at the Site and is not anticipated to represent a concern for the proposed development. In addition, the groundwater in the vicinity of the fuel ASTs (monitoring well 17-31) contained PHC F4 impacts above the applicable site standards. Given that hydrocarbon impacts were not identified in the soil samples collected from this borehole or the test pits completed in this area and the groundwater samples collected from the adjacent monitoring wells 17-29 and 17-30 did not contain detectable PHCs, the lateral extent of PHC impacted groundwater is inferred to be localized to the vicinity of monitoring well 17-31 and is inferred to be the result historical Site activities or leaching from the hydrocarbon impacted fill on the Site. It is likely that removal of the hydrocarbon impacted fill from the Site and discontinuation of fuelling/vehicle maintenance on the Site will improve the groundwater quality in this area.



7.0 LIMITATIONS

This report was prepared for the exclusive use of the Claridge Homes Corporation. Any use of this document by a third party is expressly forbidden. No assurance is made regarding the accuracy and completeness of these data. Golder disclaims responsibility for consequential financial effects on transactions or property values, or requirements for follow-up actions and costs.

This report is intended to provide an assessment of the potential environmental conditions of the Site as defined by the Site boundaries in Figure 1, which is defined as the property located between River Road and Spratt Road and east of 805-809 River Road in Ottawa, Ontario.

The assessment of the environmental conditions and hazards at this Site has been made using the results of chemical analysis of discrete samples from a limited number of locations. The Site conditions between sampling locations have been inferred based on conditions observed at test locations. Soil and groundwater conditions will vary between and beyond sample locations. Additional study 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 of undetected contamination.

The services performed as described in this document were conducted in a manner consistent with the 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.

The content of this document is based on information collected during site investigations, our present understanding of the site conditions, and our professional judgment in light of such information at the time of this document. This document provides a professional opinion and, therefore, no warranty is either expressed, implied, or made as to the conclusions, advice and recommendations offered in this document. This document 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 groundwater monitors installed during the course of this investigation have been left in place. These monitors are the property of the owner/client and not Golder Associates Ltd.





CLOSURE 8.0

We trust that the information presented in this report meets your current requirements. Should you have any questions or concerns, please do not hesitate to contact the undersigned.

GOLDER ASSOCIATES LTD.

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			17-8	17-29	17-30	17-31	17-32	17-33	Fill Pile 1
			23-Jan-17	23-Jan-17	13-Jan-17	13-Jan-17	13-Jan-17	23-Jan-17	23-Jan-17
Parameter Unit		MOE Table 3 Standards (R/P/I) ⁽¹⁾⁽²⁾	BH17-8 SA1	BH17-29 SA2	BH17-30 SA2	BH17-31 SA2	BH17-32 SA2	BH17-32 SA3 ⁽³⁾	FP1 SA1
Sample Depth	m		0 - 0.41	0.46 - 0.76	0.76 - 1.37	0.76 - 1.37	0.76 - 1.37	0.76 - 1.37	N/A
Benzene	µg/g	0.21	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	2.3	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	2.0	<0.05	< 0.05	< 0.05	<0.05	<0.05	< 0.05	<0.05
Total Xylenes	µg/g	3.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	98	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	300	1100	<50	<50	<50	<50	<50	58
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	2800	1500	<50	<50	<50	<50	<50	<50

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection limit.

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-- Chemical not analyzed or criteria not defined.

(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition Standards in

a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use for Coarse Grained Soils

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

(3) Sample ID on Laboratory Certificates of Analysis is BH17-33 SA2.

			Fill Pile 2	TP17-01	TP17-02	TP17-03	TP17-04	T	P17-05
		MOE Table 3 Standards	23-Jan-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
		(R/P/I) ⁽¹⁾⁽²⁾							(Duplicate of TP17-
Parameter	Unit	(К/Е/І)	FP2 SA2	TP17-1 SA1	TP17-2 SA1	TP17-3 SA1	TP17-4 SA1	TP17-5 SA3	5 SA3)
Sample Depth	m		N/A	0.15 - 0.30	0.35 - 0.50	0.07 - 0.47	0.20 - 0.40	2.80 - 3.0	2.80 - 3.0
Benzene	µg/g	0.21	<0.02	<0.02	<0.02	<0.02	< 0.02	< 0.02	<0.02
Toluene	µg/g	2.3	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	2.0	<0.05	<0.05	<0.05	< 0.05	< 0.05	< 0.05	<0.05
Total Xylenes	µg/g	3.1	<0.05	<0.05	<0.05	<0.05	< 0.05	< 0.05	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	<5	<5	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	98	<10	<10	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	300	920	560	630	1100	2300	<50	<50
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	2800	1800	1100	1000	1800	2800	<50	<50

Tables should be read in conjunction with the accompanying document.

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(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition Standards in

a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use for Coarse Grained Soils

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

(3) Sample ID on Laboratory Certificates of Analysis is BH17-33 SA2.

			TP17-06	TP17-07		Fill Pile 2	
			21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Parameter	Unit	Unit MOE Table 3 Standards (R/P/I) ^{(1) (2)}		TP17-7 SA2	FB2 SA1	FB2 SA2	FB2 SA3
Sample Depth	m		0.90 - 0.95	1.80 - 1.90	N/A	N/A	N/A
Benzene	µg/g	0.21	<0.02	< 0.02		<0.02	<0.02
Toluene	µg/g	2.3	<0.08	<0.08		<0.08	<0.08
Ethylbenzene	µg/g	2.0	< 0.05	< 0.05		< 0.05	<0.05
Total Xylenes	µg/g	3.1	<0.05	< 0.05		< 0.05	<0.05
Petroleum Hydrocarbons - F1 (C6-C10)	µg/g	55	<5	<5	<5	<5	<5
Petroleum Hydrocarbons - F2 (C10-C16)	µg/g	98	<10	<10	<10	<10	<10
Petroleum Hydrocarbons - F3 (C16-C34)	µg/g	300	<50	<50	2800	750	790
Petroleum Hydrocarbons - F4 (C34-C50)	µg/g	2800	<50	<50	3400	1100	1200

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(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition Standards in

a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use for Coarse Grained Soils

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

(3) Sample ID on Laboratory Certificates of Analysis is BH17-33 SA2.

			17-8	17-29	17-32	17-33	Fill Pile 1	Fill Pile 2
		MOE Table 3	23-Jan-17	23-Jan-17	13-Jan-17	23-Jan-17	23-Jan-17	23-Jan-17
Parameter	Unit	Standards (R/P/I) ⁽¹⁾⁽²⁾	BH17-8 SA1	BH17-29 SA2	BH17-32 SA2	BH17-33 SA2	FP1 SA1	FP2 SA2
Sample Depth	m		0 - 0.41	0.46 - 0.76	0.76 - 1.37	0.76 - 1.37	N/A	N/A
Naphthalene	µg/g	0.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Acenaphthene	µg/g	7.9	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	µg/g	62	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Phenanthrene	µg/g	6.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Anthracene	µg/g	0.67	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluoranthene	µg/g	0.69	<0.05	<0.05	<0.05	<0.05	0.10	<0.05
Pyrene	µg/g	78	<0.05	<0.05	<0.05	<0.05	0.09	<0.05
Benz(a)anthracene	µg/g	0.5	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Benzo(b)fluoranthene	µg/g	0.78	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(k)fluoranthene	µg/g	0.78	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene	µg/g	0.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-cd)pyrene	µg/g	0.38	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dibenz(a,h)anthracene	µg/g	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(g,h,i)perylene	µg/g	6.6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
2-and 1-methyl Naphthalene	µg/g	0.99	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

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Footnotes:

Tables should be read in conjunction with the accompanying

< value = Indicates parameter not detected above laboratory method

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-- Chemical not analyzed or criteria not defined.

(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition,

Residential/Parkland/Institutional Property Use for Coarse Grained Soils

			17-29	17-33	
		MOE Table 3	23-Jan-17	23-Jan-17	
Parameter	Unit	Standards (R/P/I) ⁽¹⁾⁽²⁾	BH17-29 SA2	BH17-33 SA2	
Sample Depth	m		0.46 - 0.76	0.76 - 1.37	
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	
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	
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	
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	
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	
1,3-Dichloropropene	ug/g	0.05	<0.04	<0.04	
n-Hexane	ug/g	2.8	<0.05	<0.05	

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(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition, Residential/Parkland/Institutional Property Use for Coarse Grained Soils

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			17-8	17-8	17-29	17-30	17-31	17-32	17-33
		MOE Table 3 Standards	23-Jan-17	23-Jan-17	23-Jan-17	13-Jan-17	13-Jan-17	13-Jan-17	23-Jan-17
Parameter	Unit	(R/P/I) ⁽¹⁾⁽²⁾	BH17-8 SA1	BH17-8 SA7	BH17-29 SA2	BH17-30 SA2	BH17-31 SA2	BH17-32 SA2	BH17-33 SA2
Sample Depth	m		0 - 0.41	4.42 - 5.03	0.46 - 0.76	0.76 - 1.37	0.76 - 1.37	0.76 - 1.37	0.76 - 1.37
Metals									
Antimony	µg/g	7.5	<0.8		<0.8			<0.8	<0.8
Arsenic	ug/g	18	3		1			4	2
Barium	ug/g	390	61		48			303	123
Beryllium	ug/g	4	<0.5		<0.5			1	0.6
Boron	ug/g	120	7		<5			7	<5
Boron (Hot Water Soluble)	ug/g	1.5	0.15		<0.10			-	0.14
Cadmium	ug/g	1.2	<0.5		<0.5			<0.5	<0.5
Chromium	ug/g	160	10		19			83	42
Cobalt	ug/g	22	4.7		5.3			20.3	10.1
Copper	ug/g	140	11		5			36	21
Lead	ug/g	120	8		3			10	5
Molybdenum	ug/g	6.9	1.3		<0.5			<0.5	<0.5
Nickel	ug/g	100	11		11			48	24
Selenium	ug/g	2.4	<0.4		<0.4			<0.4	0.5
Silver	ug/g	20	<0.2		<0.2			<0.2	<0.2
Thallium	ug/g	1	<0.4		<0.4			<0.4	<0.4
Uranium	ug/g	23	<0.5		0.9			0.8	0.6
Vanadium	ug/g	86	37		33			76	53
Zinc	ug/g	340	29		25			107	42
Chromium VI	ug/g	8	<0.2		<0.2				<0.2
Mercury	ug/g	0.27	<0.10		<0.10				<0.10
Inorganics									
Electrical Conductivity	mS/cm	0.7		0.303		2.38	2.42	0.958	
Sodium Adsorption Ratio		5		0.254		47.8	42.5	3.69	

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Footnotes:

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(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition

Standards in a Non-Potable Ground Water Condition,

Residential/Parkland/Institutional Property Use for Coarse Grained Soils

			Fill Pile 1	Fill Pile 2	TP17-04		TP17-05	TP17-06
		MOE Table 2 Standarda	23-Jan-17	23-Jan-17	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Parameter	Unit	MOE Table 3 Standards (R/P/I) ^{(1) (2)}	FP1 SA1	FP2 SA2	TP17-4 SA1	TP17-5 SA3	TP17-5 SA13 (Duplicate of TP17-5 SA3)	TP17-6 SA1
Sample Depth	m		N/A	N/A	0.20 - 0.40	2.80 - 3.0	2.80 - 3.0	0.90 - 0.95
Metals								
Antimony	µg/g	7.5	<0.8	<0.8				
Arsenic	ug/g	18	2	5				
Barium	ug/g	390	59	57				
Beryllium	ug/g	4	<0.5	<0.5				
Boron	ug/g	120	<5	7				
Boron (Hot Water Soluble)	ug/g	1.5	0.71	0.13				
Cadmium	ug/g	1.2	<0.5	<0.5				
Chromium	ug/g	160	17	13				
Cobalt	ug/g	22	4.2	6.9				
Copper	ug/g	140	11	11				
Lead	ug/g	120	12	28				
Molybdenum	ug/g	6.9	0.7	3.3				
Nickel	ug/g	100	9	13				
Selenium	ug/g	2.4	0.5	<0.4				
Silver	ug/g	20	<0.2	<0.2				
Thallium	ug/g	1	<0.4	<0.4				
Uranium	ug/g	23	0.8	0.6				
Vanadium	ug/g	86	25	32				
Zinc	ug/g	340	51	20				
Chromium VI	ug/g	8	<0.2	<0.2				
Mercury	ug/g	0.27	<0.10	<0.10				
Inorganics								
Electrical Conductivity	mS/cm	0.7			0.146	0.861	0.809	0.251
Sodium Adsorption Ratio		5			0.174	2.91	2.86	0.289

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(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition

Standards in a Non-Potable Ground Water Condition,

Residential/Parkland/Institutional Property Use for Coarse Grained Soils

			TP17-07	TP17-08	TP17-09	TP17-10 SA1
		MOE Table 3 Standards	21-Jul-17	21-Jul-17	21-Jul-17	21-Jul-17
Parameter	Unit	(R/P/I) ⁽¹⁾⁽²⁾	TP17-7 SA2	TP17-8 SA1	TP17-9 SA3	TP17-10 SA1
Sample Depth	m		1.80 - 1.90	0.90 - 1.0	2.80 - 3.0	0.90 - 1.0
Metals						
Antimony	µg/g	7.5				
Arsenic	ug/g	18				
Barium	ug/g	390				
Beryllium	ug/g	4				
Boron	ug/g	120				
Boron (Hot Water Soluble)	ug/g	1.5				
Cadmium	ug/g	1.2				
Chromium	ug/g	160				
Cobalt	ug/g	22				
Copper	ug/g	140				
Lead	ug/g	120				
Molybdenum	ug/g	6.9				
Nickel	ug/g	100				
Selenium	ug/g	2.4				
Silver	ug/g	20				
Thallium	ug/g	1				
Uranium	ug/g	23				
Vanadium	ug/g	86				
Zinc	ug/g	340				
Chromium VI	ug/g	8				
Mercury	ug/g	0.27				
Inorganics						
Electrical Conductivity	mS/cm	0.7	1.49	0.311	0.043	0.143
Sodium Adsorption Ratio		5	27.2	2.35	0.203	0.816

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection

> value = Indicates parameter detected above equipment analytical range.

-- Chemical not analyzed or criteria not defined.

(1) Ontario Reg 153/04 (2011) Table 3: Full Depth Generic Site Condition

Standards in a Non-Potable Ground Water Condition,

Residential/Parkland/Institutional Property Use for Coarse Grained Soils

		MOE Table 3	17-29	17-30	17-31	
Parameter	Units	Standards (1) (2)	MW #17-29	MW #17-30	MW #17-31	
			30-Jan-17	30-Jan-17	30-Jan-17	
Benzene	ug/L	44	<0.80	<0.20	<0.20	
Toluene	ug/L	18000	<0.80	<0.20	<0.20	
Ethylbenzene	ug/L	2300	<0.40	<0.10	<0.10	
Total Xylenes	ug/L	4200	<0.80	<0.20	<0.20	
Petroleum Hydrocarbons - F1 (C6-C10)	ug/L	750	<25	<25	<25	
Petroleum Hydrocarbons - F2 (C10-C16)	ug/L	150	<100	<100	<100	
Petroleum Hydrocarbons - F3 (C16-C34)	ug/L	500	<100	<100	480	
Petroleum Hydrocarbons - F4 (C34-C50)	ug/L	500	<100	<100	600	

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection limit.

> value = Indicates parameter detected above equipment analytical range.

-- Chemical not analyzed or criteria not defined.

(1) O.Reg 153/04 (2011) Table 3: Full Depth Generic Site Conditions in a Non-Potable Groundwater Condition, All Types of Property Use

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

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Table 6b: Groundwater Analytical Results: Polycyclic Aromatic Hydrocarbons

_		MOE Table 3	17-29
Parameter	Units	Standards ^{(1) (2)}	MW #17-29
			30-Jan-17
Naphthalene	ug/L	1400	<0.20
Acenaphthylene	ug/L	1.8	<0.20
Acenaphthene	ug/L	600	<0.20
Fluorene	ug/L	400	<0.20
Phenanthrene	ug/L	580	<0.10
Anthracene	ug/L	2.4	<0.10
Fluoranthene	ug/L	130	<0.20
Pyrene	ug/L	68	<0.20
Benz(a)anthracene	ug/L	4.7	<0.20
Chrysene	ug/L	1	<0.10
Benzo(b)fluoranthene	ug/L	0.75	<0.10
Benzo(k)fluoranthene	ug/L	0.4	<0.10
Benzo(a)pyrene	ug/L	0.81	<0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.2	<0.20
Dibenz(a,h)anthracene	ug/L	0.52	<0.20
Benzo(g,h,i)perylene	ug/L	0.2	<0.20
1- and 2-Methylnaphthalene ⁽³⁾	ug/L	1800	<0.20

Footnotes:

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection limit.

> value = Indicates parameter detected above equipment analytical range.

-- Chemical not analyzed or criteria not defined.

(1) O.Reg 153/04 (2011) Table 3: Full Depth Generic Site Conditions in a Non-Potable

Groundwater Condition, All Types of Property Use

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

(3) The methylnaphthalene standards are applicable to both 1-Methylnaphthalene and 2-

Methylnaphthalene, with the provision that if both are detected the sum of the two must not exceed the standard.

Devemator	Unite	MOE Table 3	17-29
Parameter	Units	Standards ^{(1) (2)}	MW #17-29
		Ī	30-Jan-17
1,1,1,2-Tetrachloroethane	ug/L	3.3	<0.40
1,1,1-Trichloroethane	ug/L	640	<1.20
1,1,2,2-Tetrachloroethane	ug/L	3.2	<0.40
1,1,2-Trichloroethane	ug/L	4.7	<0.80
1,1-Dichloroethane	ug/L	320	<1.20
1,1-Dichloroethylene	ug/L	1.6	<1.20
1,2-Dichlorobenzene	ug/L	4600	<0.40
1,2-Dichloroethane	ug/L	1.6	<0.80
1,2-Dichloropropane	ug/L	16	<0.80
1,3-Dichlorobenzene	ug/L	9600	<0.40
1,3-Dichloropropene	ug/L	5.2	<1.20
1,4-Dichlorobenzene	ug/L	8	<0.40
Acetone	ug/L	130000	<4.0
Bromodichloromethane	ug/L	85000	<0.80
Bromoform	ug/L	380	<0.40
Bromomethane	ug/L	5.6	<0.80
Carbon Tetrachloride	ug/L	0.79	<0.79
Chlorobenzene	ug/L	630	<0.40
Chloroform	ug/L	2.4	<0.80
cis- 1,2-Dichloroethylene	ug/L	1.6	<0.80
Dibromochloromethane	ug/L	82000	<0.40
Dichlorodifluoromethane	ug/L	4400	<0.80
Ethylene Dibromide	ug/L	0.25	<0.25
Methyl Ethyl Ketone	ug/L	470000	<4.0
Methyl Isobutyl Ketone	ug/L	140000	<4.0
Methyl tert-butyl ether	ug/L	190	<0.80
Methylene Chloride	ug/L	610	<1.20
n-Hexane	ug/L	51	<0.80
Styrene	ug/L	1300	<0.40
Tetrachloroethylene	ug/L	1.6	<0.80
trans- 1,2-Dichloroethylene	ug/L	1.6	<0.80
Trichloroethylene	ug/L	1.6	<0.80
Trichlorofluoromethane	ug/L	2500	<1.60
Vinyl Chloride	ug/L	0.5	<0.50

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection limit.

> value = Indicates parameter detected above equipment analytical range.

-- Chemical not analyzed or criteria not defined.

Grey background indicates exceedances.

(1) O.Reg 153/04 (2011) Table 3: Full Depth Generic Site Conditions in a Non-Potable

Groundwater Condition, All Types of Property Use

(2) Grey and bold background indicated paramater concentration greater than the MOE Table 3 Standards

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Deveneder	Unite	MOE Table 3	17-29	17-30
Parameter	Units	Standards ^{(1) (2)}	MW #17-29	MW #17-30
			30-Jan-17	30-Jan-17
Metals				
Antimony	ug/L	20000	<1.0	
Arsenic	ug/L	1900	1.2	
Barium	ug/L	29000	956	
Beryllium	ug/L	67	<0.5	
Boron	ug/L	45000	<10.0	
Cadmium	ug/L	2.7	<0.2	
Chromium	ug/L	810	5.1	
Cobalt	ug/L	66	24.1	
Copper	ug/L	87	9.0	
Lead	ug/L	25	<0.5	
Molybdenum	ug/L	9200	3.7	
Nickel	ug/L	490	21.6	
Selenium	ug/L	63	<1.0	
Silver	ug/L	1.5	<0.2	
Thallium	ug/L	510	<0.3	
Uranium	ug/L	420	9.0	
Vanadium	ug/L	250	0.7	
Zinc	ug/L	1100	17.6	
Mercury	ug/L	0.29	<0.02	
Chromium VI	ug/L	140	<5	
Inorganics				
Sodium	ug/L	2300000		1760000
Chloride	ug/L	2300000		4200000

Tables should be read in conjunction with the accompanying document.

< value = Indicates parameter not detected above laboratory method detection limit.

> value = Indicates parameter detected above equipment analytical range.

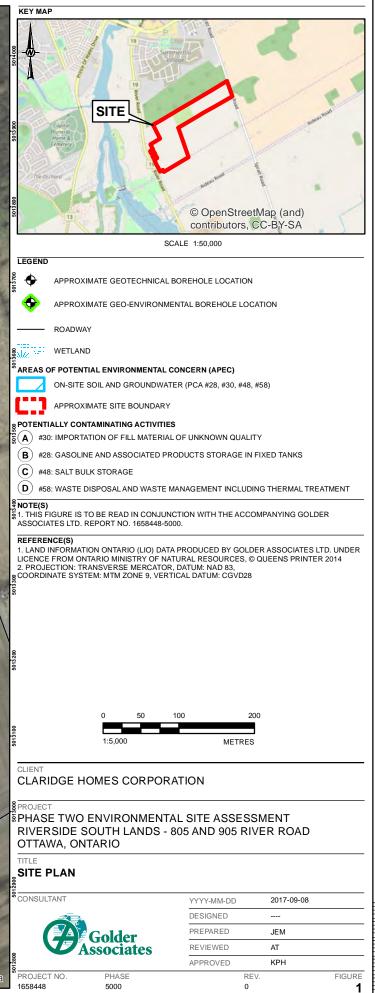
-- Chemical not analyzed or criteria not defined.

Grey background indicates exceedances.

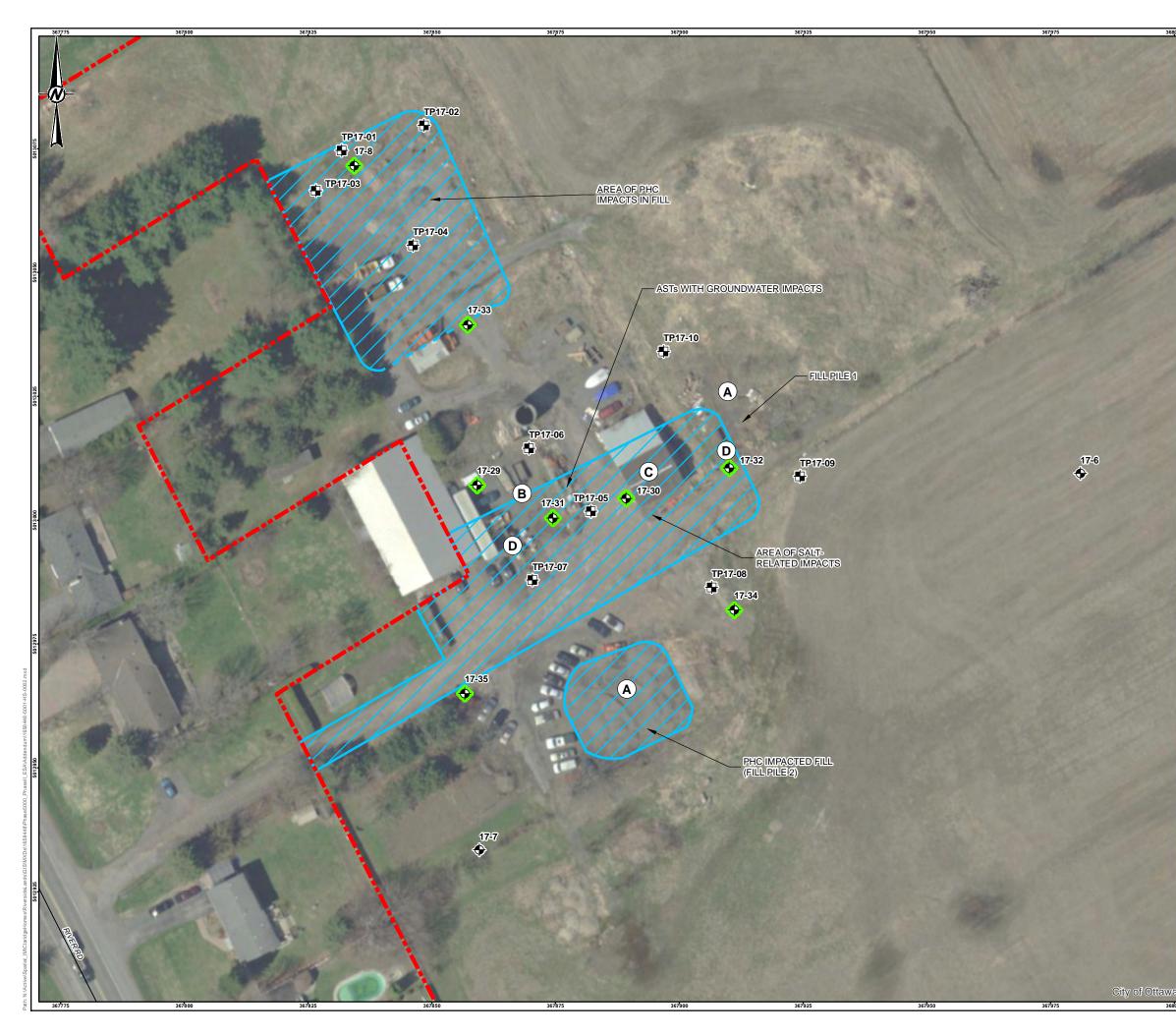
(1) O.Reg 153/04 (2011) Table 3: Full Depth Generic Site Conditions in a Non-Potable Groundwater

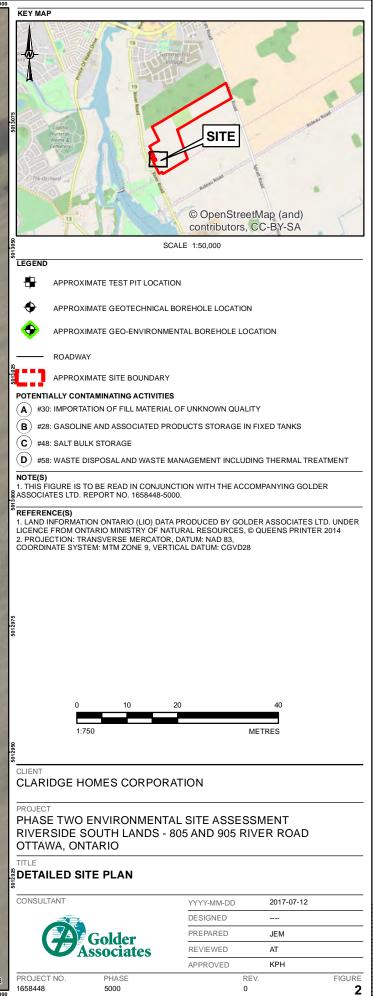
Condition, All Types of Property Use

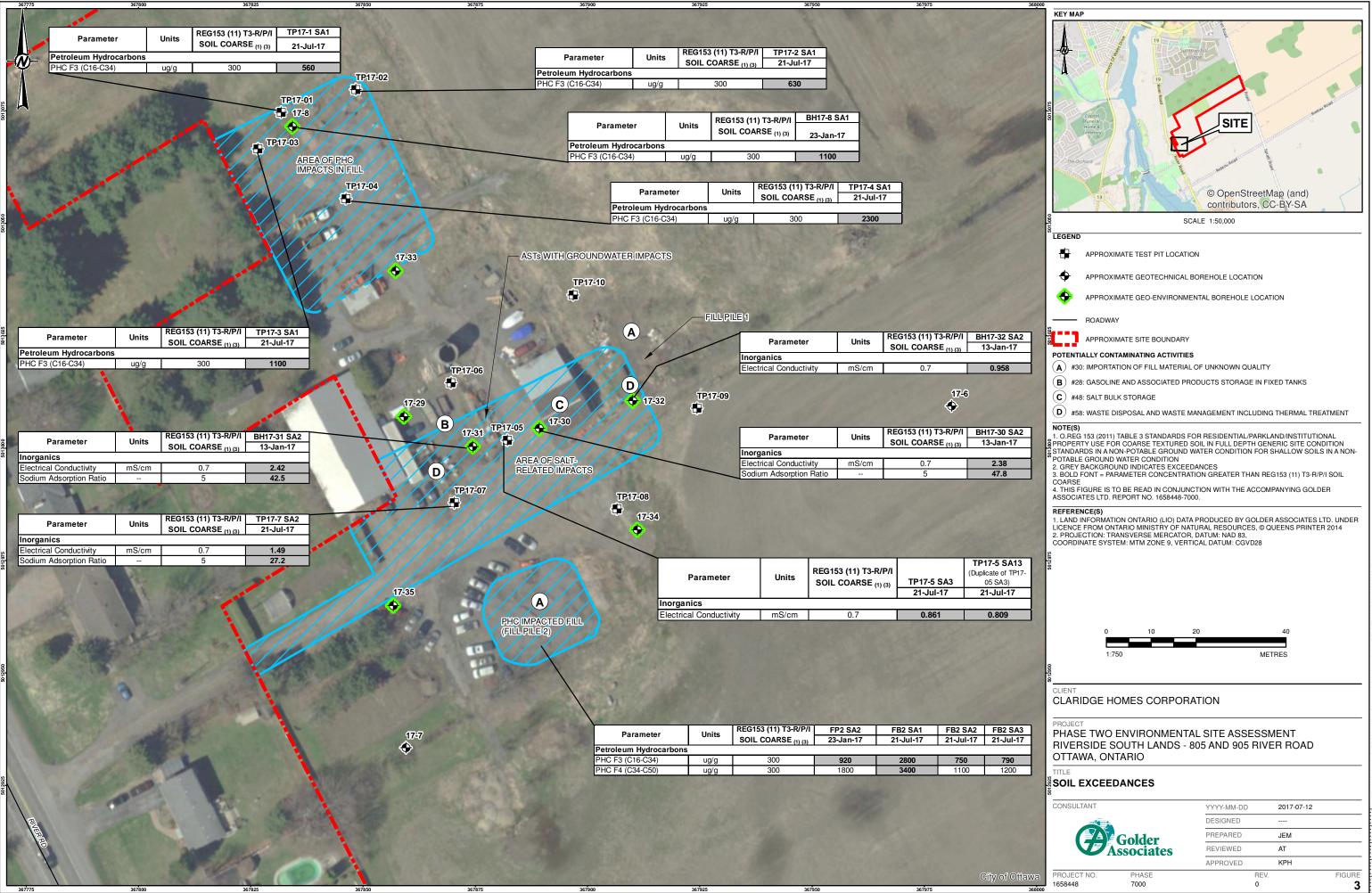




25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS

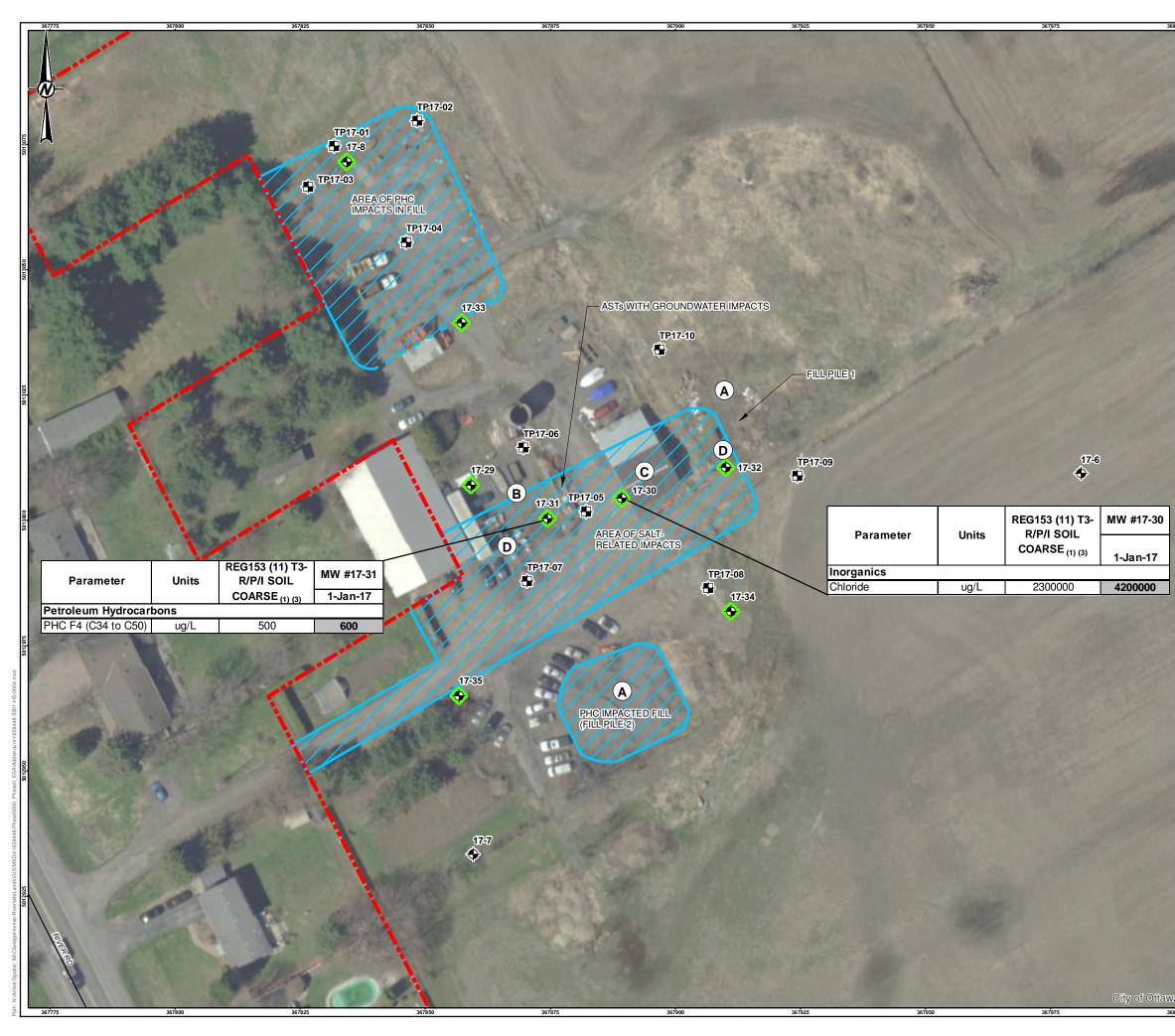


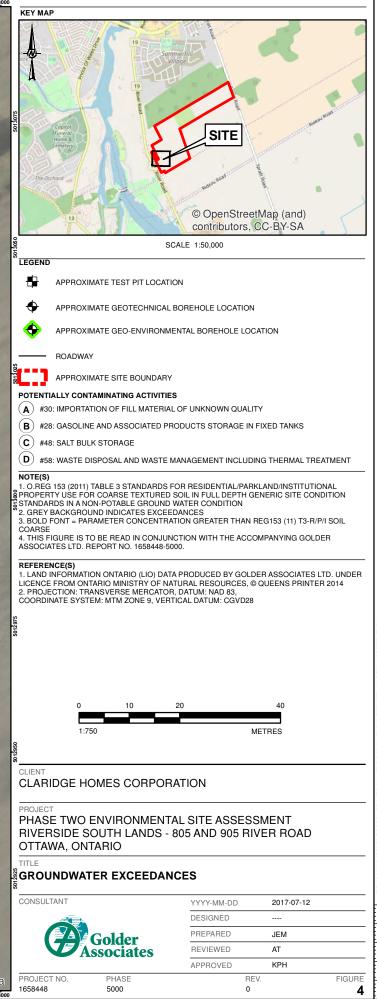




25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE H

£,









Record of Boreholes





METHOD OF SOIL CLASSIFICATION

Organic or Inorganic	Soil Group	Type of	f Soil	Gradation or Plasticity	Cu	$Cu = \frac{D_{60}}{D_{10}} \qquad \qquad Cc = \frac{(D_{30})^2}{D_{10}xD_{60}}$		Organic Content	USCS Group Symbol	Group Name		
	_	nm) is	Gravels with ≤12%	Poorly Graded		<4		≤1 or 3	≥3		GP	GRAVEL
(ss	5 mm)	Les (by mass)		Well Graded		≥4		1 to 3	3		GW	GRAVEL
by ma	SOILS an 0.07	GRAVELS (>50% by mass of coarse fraction is larger than 4.75 mm)	Gravels with >12%	Below A Line			n/a				GM	SILTY GRAVEL
SANIC t ≤30%	AINED rger th		fines (by mass)	Above A Line			n/a			<20%	GC	CLAYEY GRAVEL
INORGANIC (Organic Content ≤30% by mass)	COARSE-GRAINED SOILS (>50% by mass is larger than 0.075 mm)	of is mm)	Sands with ≤12%	Poorly Graded		<6		≤1 or i	≥3	≤30%	SP	SAND
ganic (COARS by mai	SANDS 6 by mass se fraction than 4.75	fines (by mass)	Well Graded		≥6		1 to 3	3		SW	SAND
(Or	(>50%	SANDS (≥50% by mass of coarse fraction is smaller than 4.75 mm)	Sands with	Below A Line			n/a				SM	SILTY SAND
		smal	>12% fines (by mass)	Above A Line			n/a				SC	CLAYEY SAND
Organic						I	Field Indica	tors				
or Inorganic	Soil Group	Type of	f Soil	Laboratory Tests	Dilatancy	Dry Strength	Shine Test	Thread Diameter	Toughness (of 3 mm thread)	Organic Content	USCS Group Symbol	Primary Name
	75 mm)	SILTS Non-Plastic or PI and LL plot below A-Line on Plasticity Chart below)		I familed I family	Rapid	None	None	>6 mm	N/A (can't roll 3 mm thread)	<5%	ML	SILT
(ss				Liquid Limit <50	Slow	None to Low	Dull	3mm to 6 mm	None to low	<5%	ML	CLAYEY SIL
by ma	OILS an 0.07	SILTS ic or PI	below A-Line on Plasticity Chart below)		Slow to very slow	Low to medium	Dull to slight	3mm to 6 mm	Low	5% to 30%	OL	ORGANIC SILT
ANIC ≤30%	FINE-GRAINED SOILS (≥50% by mass is smaller than 0.075 mm)	ו-Plasti	-Plasti bel Cha		Slow to very slow	Low to medium	Slight	3mm to 6 mm	Low to medium	<5%	МН	CLAYEY SIL
INORGANIC (Organic Content ≤30% by mass)		(Nor		≥50	None	Medium to high	Dull to slight	1 mm to 3 mm	Medium to high	5% to 30%	ОН	ORGANIC SILT
ganic -		olot	ant art	Liquid Limit <30	None	Low to medium	Slight to shiny	~ 3 mm	Low to medium	0%	CL	SILTY CLAY
D.		CLAYS and LL p	above A-Line on Plasticity Chart below)	Liquid Limit 30 to 50	None	Medium to high	Slight to shiny	1 mm to 3 mm	Medium	to 30%	CI	SILTY CLAY
		(Pla	Plast	Liquid Limit ≥50	None	High	Shiny	<1 mm	High	(see Note 2)	СН	CLAY
		Peat and mineral soil mixtures								30% to 75%		SILTY PEAT SANDY PEA
HIGHLY ORGANIC SOILS	by mai	Predominar may conta mineral soil, amorphou	in some fibrous or								PT	PEAT
40 30 ((d) X4	Low	Plasticity		SILTY CLAY	CLAY CH CLAYEY S ORGANIC			a hyphen, For non-co the soil h transitiona gravel.	for example, bhesive soils, as between Il material b	GP-GM, S the dual s 5% and etween "c	two symbols SW-SC and C ymbols must b 12% fines (i.e lean" and "di pol must be us	ML. e used whe e. to identif rty" sand c
Plasticity Index (PI) 05 -				Aline				liquid limit	and plasticity	y index val	ues plot in the ty Chart at lef	CL-ML are

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.

Liquid Limit (LL) 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.

CLAYEY SILT ML ORGANIC SILT OL

SILTY CLAY

20 25.5

SILTY CLAY-CLAYEY SILT, CL-MI

10

SILT ML (See Note 1)

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.



10

70



ABBREVIATIONS AND TERMS USED ON RECORDS OF BOREHOLES AND TEST PITS

PARTICLE SIZES OF CONSTITUENTS

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

MODIFIERS FOR SECONDARY AND MINOR CONSTITUENTS

Percentage by Mass	Modifier
>35	Use 'and' to combine major constituents (<i>i.e.</i> , SAND and GRAVEL, SAND and CLAY)
> 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 cm² 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); Nd:

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

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 pressu												
	Field Meint											
Field Moisture Condition Term Description												
Term	L	Description										
Dry	Soil flows freely thre	ough fingers.										
Moist	Soils are darker tha may feel cool.	an in the dry condition and										
Moist Wet	may feel cool.	an in the dry condition and ree water forming on hands										

S V	MPI	ES
SA		LEG

SAMPLES	
AS	Auger sample
BS	Block sample
CS	Chunk sample
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
ТО	Thin-walled, open – note size
TP	Thin-walled, piston – note size
WS	Wash sample

SOIL TESTS

SUIL TESTS	
w	water content
PL, w _p	plastic limit
LL, wL	liquid limit
С	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
М	sieve analysis for particle size
МН	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 whi	ch are anisotropically consolidated prior to shear are show

Tests which are anisotropically consolidated prior to shear are shown as CAD, CAU. COHESIVE SOILS

CONLOIVE C

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								

 SPT 'N' in accordance with ASTM D1586, uncorrected for overburden pressure effects; approximate only.

effects; approximate only.

 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	(a) w	Index Properties (continued) water content
π In x Iog ₁₀ g t	3.1416 natural logarithm of x x or log x, logarithm of x to base 10 acceleration due to gravity time	w _I or LL w _p or PL I _p or PI Ws I _L IC emax emin	liquid limit plastic limit plasticity index = $(w_l - w_p)$ shrinkage limit liquidity index = $(w - w_p) / I_p$ consistency index = $(w_l - w) / I_p$ void ratio in loosest state void ratio in densest state
II.	STRESS AND STRAIN	ID	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)
$\gamma \Delta$	shear strain change in, e.g. in stress: $\Delta \sigma$	(b) h	Hydraulic Properties hydraulic head or potential
E Ev	linear strain volumetric strain coefficient of viscosity	q v i	rate of flow velocity of flow hydraulic gradient
η υ σ	Poisson's ratio total stress	k	hydraulic conductivity (coefficient of permeability)
σ΄ σ΄ _{νο}	effective stress ($\sigma' = \sigma - u$) initial effective overburden stress principal stress (major, intermediate,	j	seepage force per unit volume
01, 02, 03	minor)	(c) C _c	Consolidation (one-dimensional) compression index
σ_{oct}	mean stress or octahedral stress = $(\sigma_1 + \sigma_2 + \sigma_3)/3$	Cr	(normally consolidated range) recompression index
τ u	shear stress porewater pressure	Cs	(over-consolidated range) swelling index
E G	modulus of deformation shear modulus of deformation	Cα mv	secondary compression index coefficient of volume change
ĸ	bulk modulus of compressibility	Cv	coefficient of consolidation (vertical direction)
		Ch T	coefficient of consolidation (horizontal direction)
III.	SOIL PROPERTIES	Tv U	time factor (vertical direction) degree of consolidation
(a) ρ(γ)	Index Properties bulk density (bulk unit weight)*	σ΄ _Ρ OCR	pre-consolidation stress over-consolidation ratio = $\sigma'_{P} / \sigma'_{vo}$
ρ(γ) ρ _d (γ _d)	dry density (dry unit weight)	(d)	Shear Strength
ρw(γw) ρs(γs) γ΄	density (unit weight) of water density (unit weight) of solid particles unit weight of submerged soil	τ _ρ , τ _r φ΄ δ	peak and residual shear strength effective angle of internal friction angle of interface friction coefficient of friction = tan δ
DR	$(\gamma' = \gamma - \gamma_w)$ relative density (specific gravity) of solid particles (D _R = ρ_s / ρ_w) (formerly G _s)	μ C΄ Cu, Su	effective cohesion undrained shear strength ($\phi = 0$ analysis)
e n S	void ratio porosity degree of saturation	p p' q q _u St	mean total stress $(\sigma_1 + \sigma_3)/2$ mean effective stress $(\sigma'_1 + \sigma'_3)/2$ $(\sigma_1 - \sigma_3)/2$ or $(\sigma'_1 - \sigma'_3)/2$ compressive strength $(\sigma_1 - \sigma_3)$ sensitivity
where	ty symbol is ρ . Unit weight symbol is $\gamma = \rho g$ (i.e. mass density multiplied by eration due to gravity)	Notes: 1 2	τ = c' + σ' tan φ' shear strength = (compressive strength)/2



VIIS-BHS 00

DEPTH SCALE

1 : 50

RECORD OF BOREHOLE: 17-1

SHEET 1 OF 1

BORING DATE: January 13, 2017

DATUM: Geodetic PENETRATION TEST HAMMER, 64kg; DROP, 760mm

LOCATION: N 5012839.8 ;E 367953.0

SAMPLER HAMMER, 64kg; DROP, 760mm

Bit Market Backfill DESCRIPTION Bit Market Backfill	ANDPIPE ALLATION
Image: Construct of BROUND SURFACE	T → T → T → T → T → T → T → T → T → T →
0 TOPSOIL - (ML) sardy SILT (tak) 0.00 0.00 0.00 1 TOPSOIL - (ML) sardy SILT (tak) 0.00 0.00 0.00 2 Market SM SILTY CLAY 0.00 0.00 0.00 1 CICYCHY SILT and SILTY SAND, grey brown (WEATHERE D CRUST); cohesive, wePL, very stiff 1 5 0.00 2 Market SM SILTY CLAY 0.00 1 5 0.00 3 (CICYCH) SILTY CLAY to CLAY; grey brown (WEATHERE C CRUST); cohesive, wePL, very stiff 0.00 0.00 0.00 3 (CICYCH) SILTY CLAY to CLAY; grey brown contains coblies and boulders (CILACIAL TILL); non-or-obesive, wePL, very stiff 3 3 5 0.00 4 (ML-SM) gravelly sandy SILT to SILTY 5 5 5 0.00 Standpipe 5 End of Borehole 4.50 4 5 5 5 0.00 Standpipe 5 End of Borehole 4.50 4.50 4.50 4.50 0.00 Standpipe	T → T → T → T → T → T → T → T → T → T →
2 by any other set of the set o	
3 (ML-SM) gravely sandy SILT to SILTY SAND; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, compact 4 SS 8 4 5 SS 26 5 End of Borehole Auger Refusal 4.50 4.50	ry ry
4 ML-SM) gravelly sandy SILT to SILTY SAND; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, compact 3.20 4 55 8 4 5 5 55 55 26 5 End of Borehole Auger Refusal 4.50 4 5 8	eal
4 5 <td>fill</td>	fill
5 End of Borehole Auger Refusal 4.50 WL in Standpipe Elev. 89.58 m or Jan. 30, 2017	
	pipe at m on 7



RECORD OF BOREHOLE: 17-2

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: N 5012927.0 ;E 368096.0

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 16, 2017

л Д	SOIL PROFILE			SOIL PROFILE SAMPLES DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m								HYDRAULIC CONDUCTIVITY, k, cm/s					PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	ТҮРЕ	BLOWS/0.30m	20 40 I I SHEAR STRENGTH Cu, kPa			Wp H	10 ⁻⁵ ER CONTE	NT PERC	WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0 -		GROUND TOPSOIL brown; no (SM) SILT non-cohes	SURFACE - (SM) SILTY SAND, fine; dar n-cohesive Y SAND, fine; brown; sive, moist ILTY CLAY to CLAY; grey		90.52 0.00 90.27 0.25 90.00 0.52			B	20 40	60	80	20	40	60	80		
1		brown, co fissured (\ cohesive,	Land SM) SILTY CLAY,		89.15 1.37	1	SS	7									
2	Power Auger	brown (W cohesive,	SILT and SILTY SAND; grey EATHERED CRUST); w>PL, very stiff		88.39	2	ss	3									
	-	(CI/CH) S brown, fise cohesive,	ILTY CLAY to CLAY; grey sured (WEATHRED CRUST); w>PL, very stiff		2.13	3	ss	4									
3					86.71	4	ss	8									
4		End of Bo Auger Ref			3.81												
5																	
6																	
7																	
8																	
9																	
10																	
DEI	PTH	I SCALE							Gold	er			1			LC	OGGED: PAH

RECORD OF BOREHOLE: 17-2A

LOCATION: N 5012927.0 ;E 368096.0

BORING DATE: January 16, 2017

SHEET 1 OF 1

LOCATION: N 5013008.0 ;E 368232.2

RECORD OF BOREHOLE: 17-3

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: January 10, 2017

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

SAMPLER HAMMER, 64kg; DROP, 760mm DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER STRATA PLOT 30m 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR 20 40 NUMBER STANDPIPE INSTALLATION ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT BLOWS/0. DESCRIPTION DEPTH -0^W Wp H - WI (m) 40 60 80 20 40 60 80 GROUND SURFACE 91.08 0 TOPSOIL - (ML) CLAYEY SILT; brown; 0.00 non-cohesive 90.78 0.30 (ML and SM) SILT, CLAYEY SILT and SILTY SAND; grey brown; non-cohesive, wet, very loose to loose SS 5 0 1 Native Backfill $\nabla \mathbf{k}$ 2 SS 3 89.25 1.83 (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff 2 3 SS 4 0 Bentonite Seal Power Auger n Diam. (Hollow 88.09 3 (SM) gravelly SILTY SAND; grey brown, 2.99 mm Diam. contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, SS 10 4 compact to dense 8 5 SS 34 4 Native Backfill 6 SS 28 0 5 Silica Sand SS 32 7 Standpipe 6 84.98 End of Borehole 6.10 WL in Standpipe at Elev. 89.76 m on Jan. 30, 2017 7 8 M 1658448.GPJ GAL-MIS.GDT 10/10/17 9 10 MIS-BHS 001 DEPTH SCALE LOGGED: PAH Golder 1:50 CHECKED: SAT ssociates

RECORD OF BOREHOLE: 17-4

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: N 5013152.1 ;E 368203.6

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 10, 2017

ц 	ПОН	SOIL PROFILE	1. 1	s/	AMPLE	RESISTANCE, E	TRATION 3LOWS/0.3m	Ì.		IC CONDUCT cm/s	IVITY,	ZG Z	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT (m) (m)		TYPE	20 41 SHEAR STREN Cu, kPa		80 ⊢ Q - ● ● U - O	10 ⁻⁶ H WAT Wp H	10 ⁻⁵ 10 ER CONTENT	PERCENT	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	8	GROUND SURFACE				20 4	0 60	80	20	40 6	0 80	_	
0		TOPSOIL - (ML) CLAYEY SILT; dark	91.01									_	
		brown; non-cohesive (ML and SM) SILT, CLAYEY SILT and	90.71 0.30	1									
		SILTY SAND; grey brown; non-cohesive, wet, very loose to loose		-	$\left \right $								
1				1	SS								Ā
													_
				2	SS								
2		(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED	89.03										
		brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		3	SS								
3	w Stem)			\vdash	$\left \right $								
	Power Auger mm Diam. (Hollow Stem)	(SM) gravelly SILTY SAND; grey brown, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet,	87.73 3.28		SS								
	Dov 0 mm Dia	(GLACIAL TILL); non-cohesive, wet, compact to very dense											
4	200			5	ss z								
				6	ss >								
				ľ		Ĭ							
5													
				\vdash	$\left \right $								
				7	ss 2	5							
6													
				8	SS ⁻								
		End of Borehole	84.27 6.74										
7		Auger Refusal											WL in open borehole at 1.10 m depth below
													ground surface upon completion of drilling
8													
9													
10													
DF	PTHS	SCALE					 				I		DGGED: PAH
1:							older ociates						ECKED: SAT

RECORD OF BOREHOLE: 17-5

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: N 5013072.9 ;E 368083.3

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 10, 2017

ц Д	UCH.		SOIL PROFILE	- L-		SA	MPLI		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ВÅ	PIEZOMETER
METRES	RORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	20 40 60 80 SHEAR STRENGTH Cu, kPa nat V. + Q. • rem V. ⊕ U - O 20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT Wp → → W 20 40 60 80	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0		-	GROUND SURFACE TOPSOIL - (ML) CLAYEY SILT; brown; non-cohesive (ML and SM) SILT, CLAYEY SILT and SILTY SAND; grey brown; non-cohesive,		90.40 0.00 90.15 0.25	1	GRAB					
1			wet, very loose to loose			2	SS	4				∑
2			(CI/CH) SILTY CLAY to CLAY; grey brown, fissured, contains clayey silt layers (WEATHERED CRUST); cohesive, w>PL, very stiff		89.03 1.37 88.27		SS	4				
		w Stem)	(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		2.13 87.50	4	SS	3				
3	Power Auger	200 mm Diam. (Hollo	(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		2.90		ss	2				
4									>96 +			
5						6	SS	2				
6			(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, very stiff		84.76 5.64 84.46 5.94	_	SS	4	>96 + >96 +			
			(ML) sandy SILT, some gravel; grey (GLACIAL TILL); non-cohesive, wet, very loose to loose End of Borehole		84.15 6.25							VL in open porehole at 0.80 m lepth below ground surface upon completion of
7											Ċ	Irilling
8												
9												
10												
	PTł	-1 S(CALE						Golder		LO	GGED: PAH

RECORD OF BOREHOLE: 17-6

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: N 5013009.8 ;E 367980.8

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 9, 2017

	Ŭ H.	╞	SOIL PROFILE	1.1		SA	MPLE		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	Ì,	k, (IC CONDUCTIVITY, cm/s		lg₽	PIEZOMETER
METRES	BORING METHOD			STRATA PLOT		Я		BLOWS/0.30m		80	10-6		10-3	AUUITIONAL LAB. TESTING	OR STANDPIPE
ME	SING		DESCRIPTION	ATA I	ELEV. DEPTH	NUMBER	TYPE	WS/C	SHEAR STRENGTH nat V. + Cu, kPa rem V. €	- Q - ● 9 U - O			ENT 2		INSTALLATION
i	BOF			STR/	(m)	z	`	BLO		80	Wp — 20	40 60	WI 4	47]	
		+	GROUND SURFACE		90.26			-			20			+	
0		+	TOPSOIL - (ML) CLAYEY SILT; dark		0.00					1				+	
			brown; non-cohesive (CI/CH-ML and SM) SILTY CLAY,		0.15										
			CLAYEY SILT and SILTY SAND: grev												
			brown (WEATHERED CRUST); cohesive, w>PL, very stiff				1								
						1	SS	3							
1															∇
															- <u></u> -
						2	SS	2							
2															
						3	ss	2				0			
		Stem													
	ger	ollow													
3	Power Auger	mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY arev		87.21 3.05										
	Pov	m Dia	(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff			4	SS	3							
		200 m	UNCOT , CONSIVE, WARE, VELY SUII												
		×													
4										>96 +					
-					85.99					>96 +					
		F	(CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, stiff		4.27										
			UNUSIVE, WALE, SUII												
						5	SS	2				0			
5					or 00										
		┢	(SM) gravelly SILTY SAND, some		85.08 5.18										
			gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive,												
			wet, compact			-									
6						6	SS	16			0			мн	
0		+	End of Borehole	9449	84.16 6.10										
														Ņ	VL in open
														d	orehole at 1.22 m epth below
															round surface pon completion of rilling
7														ľ	
8															
9															
10															
DEI	PTH	I SC	CALE											LO	GGED: PAH
									Golder						

LOCATION: N 5012933.6 ;E 367859.5

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 17-7

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: January 5, 2017

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD ADDITIONAL LAB. TESTING DEPTH SCALE METRES PIEZOMETER 30m STRATA PLOT 40 60 80 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR 20 NUMBER STANDPIPE INSTALLATION ELEV. TYPE SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O WATER CONTENT PERCENT BLOWS/0. DESCRIPTION DEPTH -0^W Wp 🛏 - WI (m) 40 20 40 60 80 20 60 80 GROUND SURFACE 90.24 0 FILL/TOPSOIL - (SM) SILTY SAND; 0.00 dark brown; moist 89.94 FILL - (SP-CL/CI) Mixture of SAND and SILTY CLAY; brown to grey brown; non-cohesive, moist, loose to very loose 0.30 1 RA 89.18 2 SS 4 (CI/CH) SILTY CLAY to CLAY, some sand; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff 3 SS 6 2 4 SS 2 3 SS 5 3 đ Power Auger >96 + 4 Diam E 200 6 SS 4 5 SS 2 7 84.45 5.79 (SM) SILTY SAND, some gravel; grey, contains clayey silt seams, cobbles and boulders (GLACIAL TILL); non-cohesive, 6 wet, compact 8 SS 24 7 9 SS 10 10 SS 11 8 82.02 Σſ End of Borehole 9 10 DEPTH SCALE LOGGED: DG Golder 1:50 CHECKED: SAT sociates

1658448.GPJ GAL-MIS.GDT 10/10/17

MIS-BHS 001

RECORD OF BOREHOLE: 17-8

BORING DATE: January 23, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013071.6 ;E 367834.3 SAMPLER HAMMER, 64kg; DROP, 760mm

1_1	오	SOIL PROFILE	1.		34	AMPLE		DYNAMIC PENE RESISTANCE, E	BLOWS	S/0.3m	λ,	HYDRAU k	, cm/s			누일	PIEZOMETER
METRES	BORING METHOD	DECODIDITION	STRATA PLOT	ELEV.	BER	<u></u>	BLOWS/0.30m	20 4	GTH	natV +	80 - Ω - ●	10 ⁻⁶		10 ⁻⁴		ADDITIONAL LAB. TESTING	OR STANDPIPE
ME	ORIN(DESCRIPTION	'RATA	DEPTH (m)	NUMBER	түре	'SWO'	Cu, kPa	511	rem V. €	- U- O					ADD LAB.	INSTALLATION
	ā	GROUND SURFACE	ST			\square	Ы	20 4	0	60	80	20	40	60	80		
0		FILL - (SP/GP) SAND and GRAVEL;	***	89.77 0.00		$\left\{ \cdot \right\}$						\vdash					
		dark grey to black, contains asphaltic concrete fragments; non-cohesive, moist		89.36	1	GRAB	-										
		(SM) SILTY SAND; brown; non-cohesive, moist		0.41 89.16	2	GRAB	-										
		(CI/CH) SILTY CLAY to CLAY; red brown to grey brown, fissured		0.61			-										
1		(WEATHERED CRUST); cohesive, w>PL, very stiff			3	SS	5										
				88.40													
		(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST);		1.37	4	SS	5										
		cohesive, w>PL, very stiff			4	33	5										
2						1											
					5	SS	2										
	v Stem				5												
	Auger (Hollov			86.87 2.90		1											
3	200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, contains silty fine sand seams (WEATHERED CRUST); cohesive,		2.90	6	SS	2										
	00 mm	w>PL, very stiff			5		-										
	Ñ					1											
4				85.81 3.96							>96 +						
7		(CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, stiff		3.96							+						
						$\left \right $											
					7	SS	wн										
5																	
								Ð	+								
										+							
6		End of Borehole	- 1222	83.83 5.94							+						
7																	
8																	
9																	
10																	
		l	-	I							1						1
		SCALE								r ates						1	OGGED: PAH

RECORD OF BOREHOLE: 17-9

SHEET 1 OF 1 DATUM: Geodetic

LOCATION: N 5013151.7 ;E 367949.8

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 16, 2017

RECORD OF BOREHOLE: 17-10

BORING DATE: January 16, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013218.5 ;E 368049.9 SAMPLER HAMMER, 64kg; DROP, 760mm

Į,	ТНОВ	SOIL PROFILE			SA	MPL		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3	· · ·	HYDRAULIC CONDUCTIVI k, cm/s		₽G	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV.	NUMBER	TYPE	BLOWS/0.30m	20 40 60 SHEAR STRENGTH nat	80 V. + Q-●	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ WATER CONTENT PE	10 ⁻³ RCENT	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
,≥)	BORIN		STRAT.	DEPTH (m)	NUN	Ľ	BLOW	Cu, kPa rem 20 40 60	V.⊕ U-Ō 80	Wp	WI 80	ADI LAB.	INGTALLATION
0		GROUND SURFACE		90.56									
U		TOPSOIL - (SM) SILTY SAND; dark brown; non-cohesive		0.00 90.33	1	GRAB	-						
		(SM) SILTY SAND; brown;		0.23									
		non-cohesive, moist (CI/CH) SILTY CLAY to CLAY; grey		0.46									
		brown to red brown, fissured (WEATHERED CRUST); cohesive,											
1		w>PL, very stiff			2	SS	6						
				89.19									
		(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey		1.37									
		brown (WEATHERED CRUST);			3	SS	3						
2		cohesive, w>PL, very stiff											
2													
	6				4	SS	3						
	v Stem)												
	Hollov												
3	Power Auger 200 mm Diam. (Hollow S												
	- m				5	SS	3						
	200			86.90									
		(CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, firm to stiff		3.66				Φ	+				
4													
					6	SS	wн						
5													
Ű													
								⊕	+				
									+				
				84.62					+				
6		End of Borehole		5.94									
7													
8													
J													
9													
10													
	оти	SCALE											
υE	1113	DUALE						Golder				LUU	GED: PAH

RECORD OF BOREHOLE: 17-10A

LOCATION: N 5013218.0 ;E 368050.0

BORING DATE: January 16, 2017

SHEET 1 OF 1

u Z	ПОН	SOIL PROFILE	1.		SA			DYNAMIC PENETRA RESISTANCE, BLOV			C CONDUCTIV cm/s		4GF	PIEZOMETER
METRES	BORING METHOD		STRATA PLOT	ELEV.	ШШ		BLOWS/0.30m	20 40	60 80		10 ⁻⁵ 10 ⁻⁴		ADDITIONAL LAB. TESTING	OR
ME	RING	DESCRIPTION	ATAI	DEPTH	NUMBER	TYPE	WS/0	SHEAR STRENGTH Cu, kPa	nat V. + Q - ● rem V. ⊕ U - C		R CONTENT P		ADDI AB. T	INSTALLATION
1	BOI		STR	(m)	Ž		BLO	20 40	60 80		40 60		<u> </u>	
0		GROUND SURFACE		90.56										
J		For soil stratigraphy refer to Record of Borehole 17-10		0.00									$ \top$	
1														
	(m													
2	ov St													
-	r Aug.													
	Powe													
	Power Auger 200 mm Diam. (Hollow Stem)													
	50													
3														
4														
					1	TP	PH							
		End of Dorobolo		86.14										
		End of Borehole		4.42										
5														
6														
7														
8														
9														
10														
			-1					Gold	I I	- I		I		
		SCALE					(Gold	er					GGED: PAH
1:	50							V Assoc	iates				CHE	CKED: SAT

RECORD OF BOREHOLE: 17-11

BORING DATE: January 17, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013297.0 ;E 368157.3 SAMPLER HAMMER, 64kg; DROP, 760mm

1	ПОН	SOIL PROFILE	1.		SA			DYNAMIC PENETRAT RESISTANCE, BLOW	S/0.3m	R.	k,	IC CONDUC cm/s	,	₽₽	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	түре	BLOWS/0.30m	20 40 SHEAR STRENGTH Cu, kPa	nat V	80 + Q - • • U - O			10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
5	BOF		STR/	(m)	Z		BLO	20 40		80	Wp ⊢ 20		60 80	₽ ₽	
0 -		GROUND SURFACE TOPSOIL - (ML) sandy SILT; dark brown; non-cohesive (CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		90.58 0.00 90.38 0.20											
1					2		6 2					0			
2	Auger (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, contains silty fine sand seams, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		88.60 1.98	3	ss	4								
3	Power Auger 200 mm Diam. (Hollow			86.77	4	SS	2					c	,		
4		(CI/CH) SILTY CLAY to CLAY; grey; cohesive, w>PL, stiff		3.81					+	>96 +		0			
5		(ML) sandy SILT, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet,		85.25 5.33	5		69	Ð	+		0				
6		End of Borehole		84.6 <u>4</u> 5.94			00								
7															
8															
9															
10															
DEI	PTH S	CALE				<u> </u>		Golde		1			. 1	LO	GGED: PAH

RECORD OF BOREHOLE: 17-12

BORING DATE: January 20, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013161.9 ;E 367790.1 SAMPLER HAMMER, 64kg; DROP, 760mm

Ц	CH H		SOIL PROFILE	1.		S/	MPL	_	DYNAMIC PENETF RESISTANCE, BLC	WS/0.3m	K.	HYDRAULI k, c	:m/s		₽₽	PIEZOMETER
METRES	BORING METHOD			STRATA PLOT		ER		BLOWS/0.30m	20 40		80	10 ⁻⁶		10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR
- WE	SING		DESCRIPTION	ATA F	ELEV. DEPTH	NUMBER	түре	WS/0	SHEAR STRENGT Cu, kPa	I nat V. + rem V. €	Q - • U - O		R CONTEN	T PERCENT	NDDI 1007	INSTALLATION
i	BOB	3		STR/	(m)	ž		BLO	20 40		80	Wp — 20		60 80		
		+	GROUND SURFACE		89.76								Ť			
0			TOPSOIL - (SM) SILTY SAND; dark \brown; non-cohesive	A	0.00											
			(SM) SILTY SAND; grey brown;			1	GRAE									
			non-cohesive, moist		89.15											
			(CI/CH) SILTY CLAY to CLAY; red brown and grey brown, fissured		0.61											
1			brown and grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff			2	SS	5					þ			
						3	SS	5								
2					87.63											
			(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST);		2.13											$\overline{\Delta}$
		Stem)	brown (WEATHERED CRUST); cohesive, w>PL, very stiff			4	SS	2					0			
	ger) wollow			90.00											
3	Power Auger	ш. (Ң	(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED		86.86 2.90		1									
	Pov	m Dia	CRUST); cohesive, w>PL, very stiff			5	SS	2					0			
		200 m														
											>96 +					
4											>96 +					
		ł	(CI/CH) SILTY CLAY to CLAY; grey with		85.4 <u>9</u> 4.27											
			black mottling; cohesive, w>PL, firm													
						6	SS	WН								
5																
									⊕ +							
									Ψ							
									+							
6		\rightarrow	End of Borehole		83.82 5.94				+							
0					5.54											\A/I :=
																WL in open borehole at 2.35 m depth below
																around surface
																upon completion of drilling
7																
8																
9																
10																
					•						•	· · · ·			•	•
DC	PT	H S	CALE						Gol	I =					L	ogged: Pah

RECORD OF BOREHOLE: 17-12A

LOCATION: N 5013162.0 ;E 367790.0

BORING DATE: January 23, 2017

SHEET 1 OF 1

ľ,	DOH-	SOIL PROFILE			SA	MPLE		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	Ì,	HYDRAULIC C k, cm/s		AL	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION		ELEV.	NUMBER	TYPE	BLOWS/0.30m	20 40 60 I I I SHEAR STRENGTH nat V. Cu, kPa rem V.	80	WATER C	0 ⁻⁵ 10 ⁻⁴ 10 ONTENT PERCEN		OR STANDPIPE INSTALLATION
÷ ۲	BORI		STRA	DEPTH (m)	INN	-	BLOW	20 40 60	⊕ U-O 80	Wp ┣━━━━ 20 4			
0		GROUND SURFACE		89.76									
-		For soil stratigraphy refer to Record of Borehole 17-12		0.00									
1													
2													
	e e												Σ
	Power Auger												-
	Power Auger	2											
3	000												
4													
					1	TP	PH				+ 0	с	
5		End of Borehole		84.73 5.03									
													WL in open borehole at 2.35 m depth below ground surface upon completion of
													ground surface upon completion of drilling
6													unning
Ŭ													
7													
8													
9													
10													
		l											L
DE	PTH	SCALE						Golder				L	OGGED: PAH

RECORD OF BOREHOLE: 17-13

BORING DATE: January 20, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013287.2 ;E 367889.6 SAMPLER HAMMER, 64kg; DROP, 760mm

;	ПОН	SOIL PROFILE	· · · ·		SA	MPLE		DYNAMIC PENETRATIO RESISTANCE, BLOWS/	N \).3m <	HYDRAULIC CONDUCTIVIT k, cm/s	۲, پ ل	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	20 40 60 SHEAR STRENGTH na Cu, kPa re	at V. + Q - ● m V. ⊕ U - O	Wp - O''		STANDPIPE INSTALLATION
	Δ	GROUND SURFACE	S	90.32			ā	20 40 60	80	20 40 60	80	
0		TOPSOIL - (SM) SILTY SAND; dark brown; non-cohesive (SP) SAND, some non-plastic fines; grey brown; non-cohesive, moist		0.00 90.09 0.23 89.59	1	GRAB	-					
1		(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		0.73 0.73 89.10 1.22	2	ss	4					Σ
		(CI/CH) SILTY CLAY to CLAY; red brown and grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		1.22	3	SS	4					
2	ger Mour Stom)	(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff		88.19 2.13	4	ss	2					
3	Power Auger	(CI/CH) SILTY CLAY to CLAY; grey, contains silty fine sand seams; cohesive, w>PL, firm		87.20 3.12	5	SS	2					
4								⊕ + +				
5					6	ss v	∨н					
								⊕ – –				
6		End of Borehole		84.38 5.94				+				WL in open borehole at 1.00 m depth below ground surface upon completion of
7												drilling
8												
9												
10												
DE	PTH	SCALE	1			<u>. I</u>	(Golder	I	<u> </u>	I I	LOGGED: PAH

RECORD OF BOREHOLE: 17-14

BORING DATE: January 19, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013422.4 ;E 367850.2 SAMPLER HAMMER, 64kg; DROP, 760mm

ш -	ДОН	SOIL PROFILE	<u> </u>		SA	MPL		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	ТҮРЕ	BLOWS/0.30m	20 40 60 80 SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ 20 WATER CONTENT PERCENT Wp	PIEZOMETER OR STANDPIPE INSTALLATION
-	BO		STR	(m)			BLC	20 40 60 80		
0		GROUND SURFACE TOPSOIL - (SM) SILTY SAND; dark	EEE	90.50 0.00						
		brown; non-cohesive (SM) SILTY SAND; brown, contains		90.20 0.30						
		clayey silt seams; non-cohesive, wet, loose								
					1	SS	8		0	
1							Ű			Σ
		CI/CH) SILTY CLAY to CLAY; red brown and grey brown, contains silty fine sand seams, fissured (WEATHERED		89.20 1.30						
		sand seams, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff			2	ss	3			
2										
								>96 +		
	Stem)							>96 +		
	Auger Hollow	(CI/CH) SILTY CLAY to CLAY; grey,		87.7 <u>6</u> 2.74						
3	Power Auger mm Diam. (Hollow:	contains silty fine sand seams; cohesive, w>PL, firm			3	SS	1			
	200 mm			86.99	3	55				
	8	(CI/CH) SILTY CLAY to CLAY; grey with black mottling; cohesive, w>PL, firm		3.51						
4								⊕ +		
					4	SS	wн		0	
5										
								⊕ +		
								+		
6		End of Borehole		84.56 5.94				+		
										WL in open borehole at 1.00 m
										depth below ground surface
										upon completion of drilling
7										
8										
9										
10										
DEI	PTH S	SCALE						Coldar		LOGGED: PAH
1:								Golder		CHECKED: SAT

RECORD OF BOREHOLE: 17-14A

LOCATION: N 5013422.0 ;E 367850.0

BORING DATE: January 20, 2017

SHEET 1 OF 1

щ	ЧОР	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	
DEPTH SCALE METRES	BORING METHOD		LOT		£		30m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	PIEZOMETER OR STANDPIPE INSTALLATION
METI	NG	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.30m	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	WATER CONTENT PERCENT	ビビ STANDPIPE 日前 INSTALLATION
LE	BOR		TRA	(m)	R		POV		Wp H OW WI	LAI
		GROUND SURFACE	s			\vdash	ш	20 40 60 80	20 40 60 80	
0		For soil stratigraphy refer to Record of Borehole 17-14		90.50 0.00						
		Borehole 17-14								
1										
										Native Backfill
	Ê									
	Power Auger 200 mm Diam. (Hollow Stem)									
2	Power Auger Diam. (Hollov									
	ower Diam.									
	200									
3										
3										Bentonite Seal
										Silica Sand
										<u>, </u>
4					1	TP	PH			Standpipe
		End of Borehole	+	86.23 4.27						
										WL in Standpipe at Elev. 89.78 m on
5										Jan. 30, 2017
6										
7										
8										
o										
9										
10										
.0										
		1	_			I				
DE	PTH S	SCALE						Golder		LOGGED: PAH
1:	50							Associates		CHECKED: SAT

LOCATION: N 5013372.2 ;E 368018.8

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 17-15

SHEET 1 OF 1 DATUM: Geodetic

BORING DATE: January 20, 2017

Ξ	ЮН		SOIL PROFILE	1.		S	AMPL	_	DYNAMIC PE RESISTANCE	, BLOW	S/0.3m	R.	HYDRAULIC k, cm	/s	,	β₽	PIEZOMETER
ETRES	BORING METHOD		DECODIDEION	STRATA PLOT	ELEV.	BER	Ж	BLOWS/0.30m	20 SHEAR STRE	40 NGTH		80 - Q - ●	-	10 ⁻⁵ 10 ⁻⁴		ADDITIONAL LAB. TESTING	OR STANDPIPE
METRES	ORINC		DESCRIPTION	'RATA	DEPTH (m)	NUMBER	түре	.OWS	SHEAR STRE Cu, kPa		rem V. €	9 ŭ- O	WATER Wp I			ADD LAB.	INSTALLATION
	B	_		ST			-	Б	20	40	60	80	20	40 60	80	+	
0			GROUND SURFACE TOPSOIL - (SM) SILTY SAND; dark	EEE	90.66		GRAE	_								_	
		L	brown; non-cohesive (SP) SAND, fine, some non-plastic fines;		90.43 0.23 90.25		GRAD	-									
		N	brown; non-cohesive, moist (CI/CH) SILTY CLAY to CLAY; red		0.41												
			brown to grey brown, contains silty fine sand seams, fissured (WEATHERED														
1			CRUST); cohesive, w>PL, very stiff to stiff			2	SS	4									Σ
			Jun				-										
						3	SS	4									
2						_											
									Ð			+					
					07.70							>96 +					
3		┢	(CI/CH) SILTY CLAY to CLAY, some sand; grey with black mottling, contains		87.7 <u>6</u> 2.90		1										
			sand; grey with black mottling, contains silty fine sand seams; cohesive, w>PL, firm to stiff			4	SS	2									
		Sten					-										
	Power Auger	(Hollow							Ð		+						
4	ower /	Diam. (.							
	<u>م</u>	um C								+							
		50															
						5	SS	wн									
5																	
									Ð	+							
										+							
6																	
						6	SS	wн									
											+						
7																	
											+						
											+	-					
		+	End of Borehole		82.89 7.77	-											
8																	WL in open borehole at 1.00 m depth below
																	ground surface upon completion of drilling
																	ariling
9				1													
				1													
10																	
												1					
DE	PTH	I SC	CALE					(old	er ates					L	OGGED: PAH

RECORD OF BOREHOLE: 17-16

BORING DATE: January 19, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013504.1 ;E 367981.5 SAMPLER HAMMER, 64kg; DROP, 760mm

	U CH		SOIL PROFILE	1.		SA	AMPL		DYNAMIC P RESISTANC	ENETRAT CE, BLOW	'ION S/0.3m	\mathbf{x}	HYDRAU k	LIC CON , cm/s	DUCTIVI	TY,	RG ZG	PIEZOMETER
METRES	BORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	түре	BLOWS/0.30m	20 SHEAR STF Cu, kPa	40 RENGTH	60 nat V rem V. 6	80 + Q - ● ⊕ U - O	10 ⁻⁶ WAT Wp H	ER CON	10 ⁻⁴ TENT PE		ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
)	D B O			STR	(m)	z		BLO	20	40	60	80	20	40	60			
0	-	\square	GROUND SURFACE TOPSOIL - (ML) sandy SILT; dark	222	90.43						-							
			(SM) SILTY SAND; brown, contains		90.18 0.25	1	GRAB	-										
			clayey silt seams; non-cohesive, wet			2	GRAB	-										Σ
1			(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		89.67 0.76 89.21	3	ss	2										
			(CI/CH) SILTY CLAY to CLAY; red brown and grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		1.22	4	SS	2										
2												>96+						
		Stem)			87.84							>96+						
	Power Auger	(Hollow	(CI/CH) SILTY CLAY to CLAY; grey with black mottling; cohesive, w>PL, stiff to firm		2.59													
3	Power	200 mm Diam. (Hollow :				5	SS	wн										
		200 r																
									Ð	+	_							
4											T							
						6	SS	wн										
ŗ																		
5											F							
										+								
			End of Borehole		84.64 5.79					+								
6																		WL in open borehole at 0.60 m depth below
																		ground surface upon completion of drilling
7																		
8																		
9																		
10																		
	рть	 H \$(CALE	1	1	I	1					1		I	1	I		I DGGED: PAH
1:		1.30	UNLL							Golde Ssoci	r							IECKED: SAT

RECORD OF BOREHOLE: 17-17

BORING DATE: January 17, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013432.3 ;E 368131.3 SAMPLER HAMMER, 64kg; DROP, 760mm

	DOH.	SOIL PROFILE	1.	1	SA	MPL		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	NG	PIEZOMETER
METRES	BORING METHOD	DECODIDITION	STRATA PLOT	ELEV.	BER	түре	BLOWS/0.30m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR STANDPIPE
Ψ	IORIN(DESCRIPTION	IRAT≜	DEPTH (m)	NUMBER	۲	LOWS.	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	Wp ⊢ ⊖ ^W WI	ADD LAB.	INSTALLATION
_	Ξ	GROUND SURFACE	S				B	20 40 60 80	20 40 60 80	+	
0		TOPSOIL - (ML) CLAYEY SILT; dark		90.44 0.00							
		brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; red		0.15							
		brown and grey brown, fissured (WEATHERED CRUST); cohesive,									
		w>PL, very stiff									Ā
1					1	SS	7				
				89.07							
		(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND, fine;		1.37							
		grey brown (WEATHERED CRUST); cohesive, w>PL, stiff to very stiff			2	SS	2				
2											
	i				3	SS	2				
	Power Auger	(CI/CH) SILTY CLAY to CLAY; grey;		87.70 2.74							
3	Power Auger										
					4	SS	vvH				
	G	N									
				86.48			e	₽ +			
4		(CL/CI) SILTY CLAY to CLAY; grey with black mottling, contains clayey silt		3.96							
		seams; cohesive, w>PL, stiff									
					5	SS	WLI				
Ę					5	33	****1				
5						1					
								⊕ +			
								+			
6		End of Borehole	- FEE	84.50 5.94				+			
-											WL in open
											borehole at 0.80 m depth below
											ground surface upon completion of drilling
7											
8											
9											
10											
DE	PTH	SCALE						Coldar		LC	DGGED: PAH
1:	50							Golder		СН	ECKED: SAT

RECORD OF BOREHOLE: 17-17A

LOCATION: N 5013432.0 ;E 368131.0

BORING DATE: January 17, 2017

SHEET 1 OF 1

	DESCRIPTION JND SURFACE oil stratigraphy refer to hole 17-17		STRATA PLOT	ELEV. DEPTH (m) 90.44 0.00	NUMBER	TYPE	BLOWS/0.30m	SHEAR STRE Cu, kPa	NGTH r	60 80 hat V. + rem V. ⊕ 60 80	Q - ● U - O	10 ⁻⁶ WATE Wp - 20	10 ⁻⁵ R CONTEN 			ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
GROI For s Borel) Record of		90.44			B	20		<u>30 80</u>		20	40	60 8	80		
For s Borel		D Record of															
	iune 17-17																
200 mm Dlam. (Hollow Stem)																	
200 rm Diam. (Hollow Stem)										1 1			1				
200 mm Diam. (Hollow Stem)									1								
200 rm Diam. (Hollow Stem)							- 1										
200 mm Diam. (Hollow 5																	
200 mm Diam. (H																	
200 mm Di																	
200			1														
I I -																	
					1	TP	PH										
End	of Borehole			86.78 3.66													
									<u> </u>								
									olde: socia			I					
		End of Borehole	End of Borehole		End of Borehole	End of Borehole	End of Borehole 3.66	End of Borehole	End of Borehole 3.66 I I <	End of Borehole	End of Borehole	End of Borehole 3.86	End of Borehole	End of Borehole	End of Borehole	End of Borehole	End of Borehole 3.66

RECORD OF BOREHOLE: 17-18

BORING DATE: January 19, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013586.9 ;E 368115.5 SAMPLER HAMMER, 64kg; DROP, 760mm

L S S S	THOD	SOIL PROFILE			MPLES		MIC PENE STANCE, B			َر, ``	HYDRAULIC k, cr	n/s		NAL	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	 ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.30m	SHEA Cu, kł	20 40 R STRENG Pa 20 40	GTH r r	∟ at V. + em V. ⊕	Q - • U - •	10 ⁻⁶ WATEF Wp		0 ⁻⁴ 10 ⁻³ T PERCENT WI 60 80	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0 -		GROUND SURFACE TOPSOIL - (ML) sandy SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; red brown and grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff	90.69 0.00 90.39 0.30	1	SS 5							0			Ÿ
2		(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff	<u>89.01</u> 1.68	2	SS 2	Ð			+						
3	Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY, some sand; grey with black mottling, contains silty fine sand seams; cohesive, w>PL, firm	87.95 2.74	3	SS 2	Φ	+			>96 +		0			
4	Pow 200 mm Diar	(CI/CH) SILTY CLAY to CLAY; grey with black mottling, contains clayey silt searns; cohesive, w>PL, stiff	<u>85.66</u> 5.03	4	SS W	Ð	+	++				O	0		
7		End of Borehole	<u>83.22</u> 7.47			Ð			+ +	+					WL in open borehole at 1.00 m depth below ground surface upon completion of drilling
9															
DEF	PTH S	BCALE				Â	Go	lde	<u> </u>					LC	GGED: PAH

RECORD OF BOREHOLE: 17-18A

LOCATION: N 5013586.9 ;E 368115.5

BORING DATE: January 19, 2017

SHEET 1 OF 1

щ	₽	SOIL PROFILE			SA	MPL	ES	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ں _	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		LOT		Ř]	30m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR
ME T	SING	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.30m	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	WATER CONTENT PERCENT	B. TE	STANDPIPE INSTALLATION
ž	BOF		STR/	(m)	٦٢		BLO	20 40 60 80	Wp	LA A	
		GROUND SURFACE		90.69			\neg				
0		For soil stratigraphy refer to Record of Borehole 17-18		0.00							
											¥₩
1											
											Native Backfill
	/ Stem										
2	Hollow										
	Power Auger Diam. (Hollov										
	Power Auger 200 mm Diam. (Hollow Stem)										×
	200										
3											Pontonito Soci
											Bentonite Seal
											Silica Sand
4					1	TP	PH			с	Standpipe
4				86.42							
		End of Borehole		4.27							
											WL in Standpipe at Elev. 90.39 m on
-											Elev. 90.39 m on Jan. 30, 2017
5											
6											
7											
8											
9											
10											
		0415				· · · ·					
DE	PTHS	CALE						Golder		LC	DGGED: PAH

RECORD OF BOREHOLE: 17-19

BORING DATE: January 17, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013512.2 ;E 368260.2 SAMPLER HAMMER, 64kg; DROP, 760mm

Ш.	DOH.	SOIL PROFILE	1.		SA			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ВÅ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	20 40 60 80 SHEAR STRENGTH nat V. + Q. ● Cu, kPa rem V. ⊕ U - O	wp - O Wi	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	В	GROUND SURFACE	ی ۲	91.35		$\left \right $	BI	20 40 60 80	20 40 60 80		
0		TOPSOIL - (ML) sandy SILT to CLAYEY SILT; dark brown; non-cohesive (CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		0.00 91.15 0.20		ss	4				Ā
2		(CI/CH) SILTY CLAY to CLAY, some clayey silt seams, fissured (WEATHERED CRUST); cohesive,		<u>89.37</u> 1.98	2	ss	3				
	jer llow Stem)	w>PL, very stiff			3	ss	3	>96 +			
3	Power Auger 200 mm Diam (Hollow Stem)				4	ss	3				
4	20							>96 +			
5		CVCH) SILTY CLAY to CLAY; grey;		86.78 4.57 86.24	5	ss	1				
		(SM) gravelly SILTY SAND; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, compact		5.11		_					
6		End of Borehole		<u>85.25</u> 6.10		SS	24				WL in open borehole at 1.00 m
7											depth below ground surface upon completion of drilling
8											
9											
10											
DE	PTH	SCALE				<u> </u>		Golder			GGED: PAH ECKED: SAT

RECORD OF BOREHOLE: 17-20

BORING DATE: January 18, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013674.4 ;E 368246.4 SAMPLER HAMMER, 64kg; DROP, 760mm

y I	Ц С		SOIL PROFILE			SA	MPL		DYNAMIC PENETRATION	HYDRAULIC CONDUCTIVITY, k, cm/s	و بـ	PIEZOMETER
METRES	BORING METHOD			LOT		Ř		30m	20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	L ADDITIONAL LAB. TESTING	OR
MET	5NG		DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	TYPE	BLOWS/0.30m	SHEAR STRENGTH nat V. + Q - ● Cu, kPa rem V. ⊕ U - O	WATER CONTENT PERCENT	B. TE	STANDPIPE INSTALLATION
ž	BOR	S		STR/	(m)	Z	-	BLO/	20 40 60 80	Wp		
		+	GROUND SURFACE		92.23			-			+	
0		1	TOPSOIL - (SM) SILTY SAND; dark		0.00	4	GRAB	-				
		┝	brown; non-cohesive (SM) SILTY SAND; grey brown;	T	91.98 0.25	I						
			non-cohesive, wet, loose									$\overline{\Delta}$
												<u> </u>
4		╞	(SM) gravelly SILTY SAND: grav brown		91.32 0.91	2	SS	11				
1			(SM) gravelly SILTY SAND; grey brown, contains cobbles and boulders		0.01							
			(GLACIAL TILL); non-cohesive, wet, compact to dense		1							
						3	SS	26				
2												
						4	SS	50				
		Stem)										
	ger	ollo										
3	Power Auger	200 mm Diam. (Hollow Stem)										
	Pov	m Dia				5	SS	32				
		m 00				<u> </u>						
		\sim										
4						6	SS	25				
7												
						7	SS	11				
5												
		┟	(SM/GM) SILTY SAND and GRAVEL;		87.05 5.18							
			grey; non-cohesive, wet, compact									
c						8	SS	15				
6		+	End of Borehole	34	86.13 6.10							
											, w	/L in open prehole at 0.61 m
											d d	enth helow
											gi ul	ound surface oon completion of illing
7												lining
8												
9												
10												
DF	РТ	1.50	CALE								1.00	GED: PAH
									Golder		200	

RECORD OF BOREHOLE: 17-21

SHEET 1 OF 1 DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

LOCATION: N 5013613.9 ;E 368382.0

BORING DATE: January 18, 2017

ц ,	DOH.	SOIL PROFILE	1.		S/	MPL		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	NG	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	BLOWS/0.30m	20 40 60 80 SHEAR STRENGTH nat V. + Q. ● Cu, kPa 20 40 60 80	vvp vvi	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
		GROUND SURFACE	0	94.69			ш	20 40 60 80	20 40 60 80		
0		TOPSOIL - (SM) SILTY SAND; dark brown; non-cohesive		0.00		GRAB	-				×
		(SM) SILTY SAND, some gravel; brown;	1	0.23		1					
		non-cohesive, moist									Native Backfill
		(SM/GM) SILTY SAND and GRAVEL;		93.90	2	SS	>50				
1		grey brown, contains cobbles and boulders; non-cohesive, moist, dense to				1					
		very dense									
											Bentonite Seal
					3	SS	47		0		
2					<u> </u>						
					4	SS	81				⊻₿
			滕	91.79	<u> </u>	$\left \right $					
3		(SM) SILTY SAND, some gravel; grey brown; non-cohesive, wet, compact		2.90							
					5	SS	28		0	мн	
	Stem)	(ML) sandy SILT, some gravel; grey	AN A	91.18		$\left \right $					
	2	(GLACIAL TILL); non-cohesive, wet,				1					
4					6	SS	17		0		
	Power mm Diam				\vdash	$\left \right $					
	200 п				\vdash						Native Backfill
					7	SS	21				
5											
		(SM) gravelly SILTY SAND; grey,		89.51 5.18		$\left \right $					
		contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet,			8	SS	12		0	мн	
		compact									
6						$\left \right $					
					9	SS	18				
7		(SM) SILTY SAND; grey; non-cohesive,		87.68							
		wet, compact									
											Otana da i
					10	SS	15				Standpipe
8		End of Borehole	_!. `±.	86.77 7.92							
											WL in Standpipe at Elev. 92.15 m on Jan. 30, 2017
											56.1. 00, 2017
9											
10											
DE	PTH	SCALE						Coldon		L	OGGED: PAH
1:	50							Golder		CH	ECKED: SAT

RECORD OF BOREHOLE: 17-22

BORING DATE: January 24, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013759.1 ;E 368386.0 SAMPLER HAMMER, 64kg; DROP, 760mm

L L		로	SOIL PROFILE		-	SA			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	NG	PIEZOMETER
METRES		BORING METHOD		STRATA PLOT	ELEV.	ËR	س	BLOWS/0.30m		10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR STANDPIPE
Ξ		RING	DESCRIPTION	ATA	DEPTH	NUMBER	TYPE	WS/(SHEAR STRENGTH Cu, kPanat V. + Q - ● rem V. ⊕ U - O		ADDI AB. 1	NSTALLATION
<u>ر</u>		B		STR	(m)	z		BLO	20 40 60 80	20 40 60 80	<u> `_</u>	
0			GROUND SURFACE		91.97							
Ū			TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive		0.00 91.74							
			(CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey		0.23							
			brown (WEATHERED CRUST); cohesive, w>PL, very stiff									
			conesive, w>PL, very stim					_				
1						1	SS	5				
		Ê			90.60							
		w Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED		1.37	<u> </u>						
	Auger	(Hollo	CRUST); cohesive, w>PL, very stiff									
2	ower	Diam.			89.99	2	SS	4				
-	L	200 mm Diam. (Hollow S	(ML) sandy SILT, some gravel; grey brown, contains cobbles and boulders		1.98							
		200	(GLACIAL TILL); non-cohesive, wet, compact				1					
						3	SS	17				
3			(SM) SILTY SAND, some gravel; grey,		88.92 3.05							
			contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet,			4	SS	10				
	L		compact		88.3 <u>1</u>							
	Γ	Π	Probable Glacial Till		3.66							
4												
5	DCPT	Open Hole										
	8	Open										
6												
					85.57							
			End of Borehole End of DCPT		6.40							
7												
8												
-												
9												
10												
DE	:PT	НS	CALE						Golder		LOGGE	J: PAH

RECORD OF BOREHOLE: 17-23

BORING DATE: January 25, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013679.9 ;E 368527.7 SAMPLER HAMMER, 64kg; DROP, 760mm

	DOH.	SOIL PROFILE	—		SA	MPLI		DYNAMIC PENETRAT RESISTANCE, BLOW		HYDRAULIC CONDUCTIVITY, k, cm/s	2 Z F	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		STRATA PLOT	ELEV.	ER		BLOWS/0.30m	20 40	60 80		ADDITIONAL LAB. TESTING	OR
ΞΨ	RING	DESCRIPTION	ATA	DEPTH	NUMBER	түре	WS/C	SHEAR STRENGTH Cu, kPa	nat V. + Q - ● rem V. ⊕ U - O	WATER CONTENT PERCE		INSTALLATION
ב	BOI		STR	(m)	Ž		BLO	20 40	60 80		WI 4 1	
		GROUND SURFACE		92.56					Ī			
0		TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive		0.00	1	GRAB	-					
		(CI/CH-ML and SM) SILTY CLAY		92.26								
		CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST);										
		cohesive, w>PL, very stiff										
1					2	SS	5					
				91.34								
		(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED		1.22								
	(E	CRUST); cohesive, w>PL, very stiff			3	ss	4					
	Ste											
2	Power Auger 200 mm Diam. (Hollow Stem)											
	^D ower								>96 +			
									>96+			
	200											
3		(CI/CH) SILTY CLAY to CLAY; grey,		89.6 <u>6</u> 2.90								
		contains clayey silt seams; cohesive, w>PL, stiff			4	SS	1					
								Ð	+			
4									+			
		End of Borehole		88.22 4.34								
		Auger Refusal		4.34								
5												
6												
U												
7												
8												
5												
9												
10												
		1		1					1 1		I I	
DE	PTH	SCALE					(Golde	۲		L	DGGED: PAH
1:	50							Golde	ātes		CH	ECKED: SAT

RECORD OF BOREHOLE: 17-23A

LOCATION: N 5013679.9 ;E 368527.7

BORING DATE: January 25, 2017

SHEET 1 OF 1

Ш	걸								RESIS	AIC PENE TANCE, B	LOWS	0.3m	Ì.		k, cm/s		≓ິ ^ຍ PIEZOMETER			
DEPTH SCALE METRES	BORING METHOD		DESCRIPTION	STRATA PLOT	ELEV. DEPTH		түре	BLOWS/0.30m	21 SHEAF Cu, kPa	0 40 R STRENG a			30	W/	ATER CO	D ⁵ 10 NTENT	PERCE	NT	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
<u>ں</u>	BO			STR	(m)	Z		BLC	2	0 40	6	0 8	30) 4			30		
- 0		GROUND S			92.56 0.00														+	
		Borehole 1	atigraphy refer to Record of 7-23																	
									\											
- 1									ì											
									i											
- 2	Ľ	Ное							:											
	DCPT	Open Hole																		
									i											
- 3																				
- 4									i											
	\square	End of Bor	ehole		88.29 4.27				!											
		DCPT Ref	usal																	
- 5																				
- 6																				
- 7																				
- 8																				
_																				
- 9																				
10																				
- 10																				
									Â	444 N				• 1						
DE	ΡTΗ	SCALE							E	Go	Ide	*							LO	GGED: PAH

RECORD OF BOREHOLE: 17-24

BORING DATE: January 24, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013840.9 ;E 368514.0 SAMPLER HAMMER, 64kg; DROP, 760mm

Ш	D C F		SOIL PROFILE			SA	MPL		DYNAMIC PEI RESISTANCE	NETRAT , BLOW	'ION S/0.3m	Ì.	HYDR	AULIC C k, cm/s	ONDUC	FIVITY,	2g	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		DECODICTION	STRATA PLOT	ELEV.	BER	Ж	BLOWS/0.30m		40 1		80			1	0 ⁻⁴ 10 ⁻	———— Ĕ ĭĭ	OR STANDPIPE
ΓΞ	30RIN		DESCRIPTION	TRAT/	DEPTH (m)	NUMBER	TYPE	LOWS	SHEAR STRE Cu, kPa				VV	p	—0 ^W	W		INSTALLATION
		-	GROUND SURFACE	°.	92.58			ē	20	40	60	80	2	20 4	40 (<u>50 80</u>		
0			TOPSOIL - (ML) sandy SILT; dark brown; non-cohesive (CI/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		0.00 92.31 0.27	1	ss	4										
2			(CI/CH) SILTY CLAY to CLAY; grey brown, slightly fissured (WEATHERED CRUST); cohesive, w>PL, stiff		<u>90.60</u> 1.98	2	ss	2						0		0		
3	Power Auger	00 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey, contains silty fine sand seams; cohesive, w>PL, firm to stiff		89.5 <u>3</u> 3.05	4	ss	wн										
4		2				5	ss	wн	⊕	-					0			
5							-			+	+							
7		_	(ML) sandy SILT, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet, very loose End of Borehole Auger Refusal		86.33 6.25 86.03 6.55		ss	3										
8																		
9																		
10																		
DE	I PTH	-150	CALE	1	1	I	<u> </u>		A	olde	er ates		1	I	I	1	LC CHE	GGED: PAH

RECORD OF BOREHOLE: 17-24A

LOCATION: N 5013841.0 ;E 368514.0

BORING DATE: January 24, 2017

SHEET 1 OF 1

Ш	ДОН	SOIL PROFILE	1		SA	MPL		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ĢĒ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	BLOWS/0.30m	20 40 60 80 SHEAR STRENGTH nat V. + Q ● Cu, kPa rem V. ⊕ U O	10 ⁶ 10 ⁵ 10 ⁴ 10 ³ WATER CONTENT PERCENT Wp I → O ^W WI	ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATION
	B	GROUND SURFACE	ST				В	20 40 60 80	20 40 60 80		
- 0		For soil stratigraphy refer to Record of Borehole 17-24		92.58 0.00							
- 1	Power Auger 200 mm Diam. (Hollow Stern)										Native Backfill Bentonite Seal
- 3		End of Borehole		<u>89.07</u> 3.51	1	TP	РН		• • •	с	Standpipe
- 4											WL in Standpipe at Elev. 91.78 m on Jan. 30, 2017
- 5											
- 6											
- 7											
- 8											
- 9											
- 10											
DE 1 : :		GCALE						Golder			DGGED: PAH ECKED: SAT

RECORD OF BOREHOLE: 17-25

BORING DATE: January 25, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013760.8 ;E 368661.4 SAMPLER HAMMER, 64kg; DROP, 760mm

л Н Г	THOL	SOIL PROFILE			SAM	MPLE		AMIC PENETF STANCE, BLC		· · ·		cm/s		RGA	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION		LEV. EPTH	NUMBER	TYPE	SHE Cu, F	20 40 AR STRENGT Pa	60 H nat \ rem	80	10 ⁻⁶ WAT	ER CONTEN		B. TEX	OR STANDPIPE INSTALLATION
2	BOR		STR/	(m)	z	- -		<u>20 40</u>	60	80	Wp ⊢ 20	40 V	/I W 60 80		
0		GROUND SURFACE TOPSOIL - (ML) sandy SILT; dark	ESSI	93.17		-	+						+		
1		brown; non-cohesive (Cl/CH-ML and SM) SILTY CLAY, CLAYEY SILT and SILTY SAND; grey brown (WEATHERED CRUST); cohesive, w>PL, very stiff		92.92 0.25	1	SS	5								⊻
2	Auger (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, contains clayey silt seams, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		1.22	2	SS	5								
	Power Auger 200 mm Diam. (Hollow				3	SS	5								
3				-	4	SS	2								
4		(ML) sandy SILT, some gravel; grey, contains cobbles and boulders (GLACIAL TILL); non-cohesive, wet,		89.33 3.84 88.98	5	SS >	50			>96 +					
5		Very dense End of Borehole Auger Refusal		4.19											WL in open borehole at 0.30 m depth below ground surface upon completion of drilling
6															
7															
8															
9															
10															
DE	PTH	SCALE					Â	Gol	der					L	ogged: Pah

RECORD OF BOREHOLE: 17-26

BORING DATE: January 25, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013917.4 ;E 368640.0 SAMPLER HAMMER, 64kg; DROP, 760mm

2 b c c c c c c c c c c c c c c c c c c	DESCRIPTION GROUND SURFACE TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff (CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff		ELEV. DEPTH (m) 93.09 0.00 92.86 0.23	1	BHALL GRAE	4 BLOWS/0/8	20 SHEAR Cu, kPa 20	STRENG	iTH n re	at V. + em V. ⊕	Q - ● U - ○					0 ⁻³ NT WI 00	ADDITIONAL LAB. TESTING	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	GROUND SURFACE TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff	STRATA	93.09 0.00 92.86	2	GRAE	3 - 5						Wp			I V		ADDI LAB. 7	INSTALLATION
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff		93.09 0.00 92.86	2	GRAE	3 - 5	22	0 40	6	0 8	0							
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff		0.00 92.86	2	ss	5												Σ
1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff		92.86	2	ss	5												Σ
2 5 5 7 L Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff to stiff		0.23	2														∑
1 5 20 mm Diam. (Hollow Stem)	CRUST); cohesive, w>PL, very stiff to stiff																	Υ <u>Υ</u>
5 5 7 Power Auger 200 mm Diam. (Hollow Stem)	T(CI/CH) SILTY CLAY to CLAY; grey,														1	4 I		1
5 5 7 Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff															i		
G A A C Auger Auger 200 mm Diam. (Hollow Stem)	CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff			3	ss	4												
G A A C Auger Auger 200 mm Diam. (Hollow Stem)	CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff			3	ss													
G b ω Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff			3	SS													
G b ω Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff					4												
G A C Power Auger 200 mm Diam. (Hollow Stem) 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff																	
2 4 5 200 mm Diam. (Hollow	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff																	
2 4 5 Power Auger Auger 200 mm Diam. (Hollow	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff						⊕				+							
5	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff										+							
5	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff																	
5	(CI/CH) SILTY CLAY to CLAY; grey, contains clayey silt seams; cohesive, w>PL, stiff		90.04															
5	w>PL, stiff		3.05	4	SS	1												
5	1																	
5																		
5	(SP) SAND; grey brown; non-cohesive,		89.28 3.81						+									
5	wet, compact			-														
5				5	SS													
5	(SM) gravelly SILTY SAND; brown,	200	88.52 4.57															
	contains cobbles and boulders;		4.37															
	non-cohesive, wet, compact to very dense																	
		渊																
			87.57	6	SS	>50												
	End of Borehole Auger Refusal		5.52															WL in open
Ŭ.																		WL in open borehole at 0.50 m depth below
																		ground surface upon completion of
																		drilling
7																		
8																		
9																		
10																		
																	'	
DEPTH S								Gol Asso						L		. <u> </u>		DGGED: PAH

RECORD OF BOREHOLE: 17-27

SHEET 1 OF 2 DATUM: Geodetic

LOCATION: N 5013836.4 ;E 368790.7

SAMPLER HAMMER, 64kg; DROP, 760mm

BORING DATE: January 25-26, 2017

	Ē	SOIL PROFILE			SA	MPL		DYNAMIC PENETRA RESISTANCE, BLOW			HYDRAULIC CONDUC k, cm/s		μg	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		STRATA PLOT	ELEV.	ER		BLOWS/0.30m	20 40	60 80	`		10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR
Β	RING	DESCRIPTION	ATA	DEPTH	NUMBER	TYPE)/S/(SHEAR STRENGTH Cu, kPa	nat V. + Q - rem V. ⊕ U -	0	WATER CONTEN		ADDI [.] AB. T	INSTALLATION
	BO		STF	(m)	2		BLC	20 40	60 80		20 40	60 80		
0		GROUND SURFACE TOPSOIL - (CL) SILTY CLAY; dark	====	93.85			\square					<u> </u>	-	X
		brown; cohesive		0.00 93.65 0.20										
		(CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED												
		CRUST); cohesive, w>PL, very stiff												
1	/ Stem)				1	SS	6				⊢ – – –	4		
	Auger													
	'ower / Diam. (0			
	Power Auger 200 mm Diam. (Hollow S			92.02	2	SS	4							
2	20((SM) gravelly SILTY SAND; brown, contains cobbles and boulders;		1.83							0			
ŕ		contains cobbles and boulders; non-cohesive, wet, loose	豚			1								Native Backfill
			驟		3	SS	8						мн	
ł						-								🕅
	Rotary Drill NW Tricone				4	RC	DD							
3	Rota NW 1			90.57										🛛 🕅
ľ		Borehole continued on RECORD OF DRILLHOLE 17-27	f	3.28		1								
4														
4														
5														
5														
6														
U														
7														
'														
8														
Ŭ														
9														
J														
10														
10														
						I			1 1			<u> </u>		I
	PTH S	CALE						Gold) #				L	ogged: Pah

_		ION: N 5013836.4 ;E 368790.7 ATION: -90° AZIMUTH:	 		NN NN NN	JN	DRI	ILL F	RIG: NG C	CM CON	E: Ja IE 850 TRAC	сто	R: (PL -	C - Plar	nar	P0-	Polist	hed					ken Ro			
	DRILLING RECORD	DESCRIPTION	ELEV. DEPTH (m)	RUN No.	FLUSH <u>COLOUR</u>	SHF VN CJ RE TOT/	R-Shea - Vein - Conj COVE	ar ijugat ERY	R.Q.	-00 -0R - CL -	- Foliati - Contac - Orthog - Cleava - Cleava - RACT. INDEX PER 0.25 m	ict gonal age		UN- ST - IR -	- Step - Irreg SCON RE IS	dulating	Ro - MB- DATA		ensid oth ih nanica	al Bre	eak s	abbrevi of abbr symbol ULIC TIVITY 'sec	viations reviatio ls. YPoint Ini (M	metral t Load MPa)	o list		
Ţ		BEDROCK SURFACE Fresh, thinly to medium bedded, grey,	90.57 3.28	F		Щ	Щ	Ш	\prod	Ш	Ĩ		\prod	Щ	Ĥ			\square	F	Ħ	\square	\square	Ħ	Ш			T KAT
4	NW Tricone	fine grained LIMESTONE REDROCK	3.20	1	100																					Native Backfill	
5	Rotary Drill NQ Core	e00		2	100																					Bentonite Seal Silica Sand	<u> Navionia</u>
6		End of Drillhole	<u>87.24</u> 6.61	3	100																					Standpipe	
7			0.2.																							WL in Standpipe at Elev. 93.05 m on Jan. 30, 2017	
8																											
9																											
1																											
2																											
3																											

RECORD OF BOREHOLE: 17-27A

LOCATION: N 5013836.4 ;E 368790.7

BORING DATE: January 25, 2017

SHEET 1 OF 1

DATUM: Geodetic

S S S	ETHOD	SOIL PROFILE	DT DT			MPLES		MIC PEN TANCE,			30		k, cm/s			10 ⁻³	NAL TING	PIEZOMETER OR
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE BLOWS/0.30m	SHEA Cu, kF	R STREM 'a	IGTH	nat V. + rem V. €	30 Q - ● U - ○	W W	ATER C	0 ⁻⁵ 1 ONTENT	F PERCE	ENT WI	ADDITIONAL LAB. TESTING	STANDPIPE INSTALLATION
\rightarrow		GROUND SURFACE	S.	93.85				20 4	10 (50 8	30	2	20 4	40 (50	80		
0		For soil stratigraphy refer to Record of Borehole 17-27		0.00														
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							$\langle \cdot \rangle$											
1																		
'	Ê																	
	Power Auger 200 mm Diam. (Hollow Stem)						!											
	Power Auger n Diam. (Hollo																	
2	m Diar						`·											
	200 m							`·										
									>									
3									<u>\</u>	-								
				90.41							 	138						
ŀ		End of Borehole DCPT Refusal		3.44								130						
4																		
5																		
6																		
7																		
8																		
9																		
10																		
.5																		
	I					<u>. </u>	Â					•						
DEF	PTH S 50	CALE						G	olde	r <u>Mes</u>								ogged: Pah Ecked: Sat

RECORD OF BOREHOLE: 17-28

BORING DATE: January 26, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013987.7 ;E 368751.8 SAMPLER HAMMER, 64kg; DROP, 760mm

S	тнор	SOIL PROFILE	1 - 1		SA	MPLI		DYNAMIC PEN RESISTANCE,	BLOWS	6/0.3m	$\boldsymbol{\lambda}$		k, cm/s				IAL ING	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	TA DE	_EV. PTH (m)	NUMBER	TYPE	BLOWS/0.30m	SHEAR STREI Cu, kPa	NGTH	⊥ nat V. + rem V. ⊕	Q - • U - O	10 ⁻⁶ WA ⁻ Wp 1 20	TER CO		PERCE	0 ⁻³ NT WI 30	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0		GROUND SURFACE TOPSOIL - (ML) CLAYEY SILT; dark brown; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED		93.95 0.00 93.72 0.23			E		40				4	0 0				
1	iger ollow Stem)	CRUST); cohesive, w>PL, very stiff			1	SS	5											Native Backfill
	Power Auger 200 mm Diam. (Hollow Stem)				2	SS	6											Silica Sand
2	0	(SM) gravelly SILTY SAND; brown, contains cobbles and boulders; non-cohesive, wet, compact to dense		91.8 <u>2</u> 2.13	3	SS	29											Standpipe
3	DCPT Open Hole	End of Borehole DCPT Refusal		90.75 3.20														Cave
4																		WL in Standpipe at Elev. 93.65 m on Jan. 30, 2017
5																		
6																		
7																		
8																		
9																		
10																		
DEI		SCALE					(G	olde	r	<u>I</u>	<u> </u>		<u> </u>	<u>I</u>	<u>ı </u>		l DGGED: PAH IECKED: SAT

RECORD OF BOREHOLE: 17-29

BORING DATE: January 23, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013007.0 ;E 367859.2 SAMPLER HAMMER, 64kg; DROP, 760mm

HOD	SOIL PROFILE			SA	MPL		HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s	
DEPTH SCALE METRES BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	BLOWS/0.30m	Headspace 40 60 80 20 40 60 80 HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected 20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT Wp ├───────── WI 20 40 60 80	PIEZOMETER OR STANDPIPE INSTALLATION
M 0 1 2 M 1 2 3 O 1 2 3	GROUND SURFACE FILL - Asphaltic concrete grinding and chunks TOPSOIL - (SM) SILTY SAND; dark			1 2 3 4	GRAE SS SS	5	[%LEL] ND = Not Detected 20 40 60 80 ⊕ ⊕ ⊕ ⊕ ⊕ ⊕	Wp ├─────────── WI	Fush Mount Casing Bentonite Seal Silica Sand 50 mm Diam. PVC #10 Slot Screen WL in Screen at Elev. 89.45 m on Jan. 30, 2017
· 7									
9									

RECORD OF BOREHOLE: 17-30

BORING DATE: January 13, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013004.5 ;E 367889.2 SAMPLER HAMMER, 64kg; DROP, 760mm

Ц	Ы	SOIL PROFILE			SA	MPL		CONCENTRATIONS [PPM]	HYDRAULIC CONDUCTIVITY, k, cm/s	μŞ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		STRATA PLOT		н.		.30m	HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 20 40 60 80 1 1 1 1	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³	ADDITIONAL LAB. TESTING	OR
MET	RING	DESCRIPTION	ATA F	ELEV. DEPTH	NUMBER	TYPE	NS/0	HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS	WATER CONTENT PERCENT	DDIT B. TI	INSTALLATION
ä	BOF		STR/	(m)	۲		BLOWS/0.3	[%LEL] <i>ND</i> = <i>Not Detected</i> 20 40 60 80	Wp		
		GROUND SURFACE		89.95							
- 0		ASPHALTIC CONCRETE FILL - (SW-GW) SAND and GRAVEL;	****	0.00 0.10				Φ		I I	lush Mount Casing Silica Sand
		dark grey brown (PAVEMENT		0.20	1			⊕		1 1	
		STRŬCŤURE); non-cohesive, moist TOPSOIL - (SM) SILTY SAND, fine;			1	SS	18	⊕			Bentonite Seal
		black and grey; non-cohesive (CI/CH) SILTY CLAY to CLAY; grey									Silica Sand
1	(moto	brown, contains silty fine sand seams, fissured (WEATHERED CRUST);			2	SS	7	⊕			
	Iger	cohesive, w>PL, very stiff									
	Power Auger									5	0 mm Diam. PVC
	Pol	cohesive, w>PL, very stiff			3	SS	3			ľ	
2	000					55	5				
										8	Silica Sand
					4	SS	2	•			Bentonite Seal
3		End of Borehole		87.05 2.90							
-			1								M in Correct of
										6	VL in Screen at Elev. 89.36 m on lan. 30, 2017
			1								
4			1								
			1								
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7			1								
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9											
			1								
10											
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DE	PTH	SCALE					(Golder		LO	GGED: PAH

RECORD OF BOREHOLE: 17-31

BORING DATE: January 13, 2017

DATUM: Geodetic

LOCATION: N 5013000.4 ;E 367874.4 SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

SHEET 1 OF 1

, ALE	ТНОБ	SOIL PROFILE	⊢	1	SA	MPL		HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s	ING	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	ND Not Dictor 60 80 20 40 60 80 HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS □ [%] [%] [%] LEL] ND = Not Detected 20 40 60 80	10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT Wp → ^W WI 20 40 60 80	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0		GROUND SURFACE		90.07							
1	/ Stem)	FILL - (GP) sandy GRAVEL, angular; grey, contains asphalt fragments; non-cohesive, moist (CI/CH) SILTY CLAY to CLAY; grey brown, contains silty fine sand seams, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		0.00 89.77 0.30		GRAB		Φ			Flush Mount Casing Silica Sand Bentonite Seal Silica Sand
2	Power Auger 200 mm Diam. (Hollow				3	SS	6	⊕			50 mm Diam. PVC
3		End of Borehole		<u>87.17</u> 2.90	4	SS	2	⊕			Silica Sand
J											WL in Screen at Elev. 89.44 m on Jan. 30, 2017
4											
5											
6											
7											
8											
9											
10											
DEI		CALE		1	1	<u>ı </u>		Golder			I DGGED: PAH ECKED: SAT

RECORD OF BOREHOLE: 17-32

BORING DATE: January 13, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013010.6 ;E 367910.1 SAMPLER HAMMER, 64kg; DROP, 760mm

Į	НОВ	SOIL PROFILE			SA	MPLE		HEADS CONCE ND = No 20	NTRAT	ONS [PI	, vapol PM]	IR ⊕		k, cm/s				NGAL	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	түре	BLOWS/0.30m	HEADS VAPOU [%LEL]	PACE C R CONO ND = No	OMBUS CENTRA	TIBLE TIONS ed		w w	ATER C		T PERC	I WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
_		GROUND SURFACE		89.84				2() 4	0 6	8 0	0	2		40	60	80		
0		FILL - (SM-GM) SILTY SAND and GRAVEL; brown; non-cohesive TOPSOIL - (ML) sandy SILT; dark brown		0.00 0.08 89.54 0.30	1	GRAB	-	€											
	Stem)	to black; non-cohesive // (Cl/CH) SILTY CLAY to CLAY; grey brown, contains silty fine sand seams, fissured (WEATHERED CRUST);		0.00															
1	Auger (Hollow	fissured (WEATHERED CRUST); cohesive, w>PL, very stiff			2	SS	7	Ð											
	Power 200 mm Diam.																		Ā
	200				3	SS	3	⊕											
2		End of Borehole		87.71 2.13															
																			WL in open borehole at 1.30 m depth below ground surface
3																			ground surface upon completion of drilling
4																			
5																			
5																			
6																			
7																			
8																			
9																			
10																			
									•										
DEF	PTH S 50	CALE					(G	older ocia	•								DGGED: PAH ECKED: SAT

RECORD OF BOREHOLE: 17-33

BORING DATE: January 23, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5013039.4 ;E 367857.2 SAMPLER HAMMER, 64kg; DROP, 760mm

Ц	ПОН	SOIL PROFILE			SA	MPL		CONCEN	ACE ORGAI	IC VAF [PPM]	OUR	⊕	HIDRA	k, cm/s	UNDUC	TIVITY,		μŞ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSP VAPOUR [%LEL] A	Detected 40 ACE COMB CONCENT D = Not Dete	RATION ected	S		W Wr	ATER C			WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
		GROUND SURFACE	S	89.99			ш	20	40	60	80		2	0 4		60	80		
0		ASPHALTIC CONCRETE	~~~	0.00						1	\top						1		
		FILL - Asphaltic concrete	Ж¥	0.12 89.66 0.33		GRAB		0											
	Stem)	(ML) CLAYEY SILT; grey with black staining (WEATHERED CRUST); cohesive, w>PL		89.38	2	GRAE	-	Ð											
	er St	(CI/CH) SILTY CLAY to CLAY; grey		0.61															
1	Power Auger	brown and red brown, fissured (WEATHERED CRUST); cohesive,			3	SS	6	Φ											
	Powe	w>PL, very stiff					-	-											
	200 mm Diam (Hollow			88.47															
	20	CLAYEY SILT and SILTY SAND; grey		1.52															
2		brown (WEATHERED CRUST); cohesive, w>PL, very stiff			4	SS	3	Ð											
		End of Borehole	XXX	87.86 2.13															
3																			
5																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
	ртн	SCALE																10) GGED: PAH
υE		JUNEL							Gold Assoc	er								LC	JOGLD. FAR

RECORD OF BOREHOLE: 17-34

BORING DATE: January 13, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5012981.8 ;E 367911.1 SAMPLER HAMMER, 64kg; DROP, 760mm

	ГНОВ	SOIL PROFILE			SA	MPLE		HEADSPACE CONCENTR ND = Not Det 20	ORGANI	C VAPOUI PM]	R ⊕		k, cm/s		AL	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	HEADSPACE VAPOUR CC [%LEL] ND = 20	COMBUS			10 ⁶ WA ⁻ Wp I 20	TER CO		ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
0		GROUND SURFACE		89.99												
		TOPSOIL - (ML) sandy SILT; dark brown; non-cohesive		0.00 89.69	1	GRAB	-	0								
1	Power Auger 200 mm Diam. (Hollow Stem)	(CI/CH) SILTY CLAY to CLAY; grey brown, contains silty sand seams, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		0.30	2	SS	6	Ð								Ϋ́
2	200				3	SS	3	Ð								
-		End of Borehole		87.86 2.13												
3																WL in open borehole at 1.06 m depth below ground surface upon completion of drilling
4																
5																
6																
7																
8																
9																
10																
DEF	PTH S	CALE							lolde: socia	<u> </u>						DGGED: PAH

RECORD OF BOREHOLE: 17-35

BORING DATE: January 13, 2017

SHEET 1 OF 1

DATUM: Geodetic

LOCATION: N 5012965.0 ;E 367856.7 SAMPLER HAMMER, 64kg; DROP, 760mm

ц	Ц	SOIL PROFILE			SA	MPL	_	HEADSPACE ORC	NS [PPM]	⊕	k, cn	/s	ا ک ب	PIEZOMETER
DEP IN SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.30m	CONCENTRATION ND = Not Detected 20 40 I HEADSPACE COM VAPOUR CONCEI [%LEL] ND = Not D	MBUSTIBLE NTRATIONS Detected		Wp —	10 ⁻⁵ 10 CONTENT	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	ш	GROUND SURFACE	S				В	20 40	60 80		20	40 60	+	
0	Stem)	ASPHALTIC CONCRETE FILL - (SP-GP) SAND and GRAVEL, angular; grey (PAVEMENT STRUCTURE); non-cohesive, moist TOPSOIL - (ML) sandy SILT; dark		90.45 0.06 90.11 0.34 89.84 0.61	1	GRAE	} -	e						
1	Power Auger 200 mm Diam. (Hollow S	(SM) SILTY SAND; grey brown, contains clayey silt seams; non-cohesive, wet, loose (CI/CH) SILTY CLAY to CLAY; grey brown, fissured (WEATHERED CRUST); cohesive, w>PL, very stiff		<u>89.23</u> 1.22	2	ss	7	Φ						
2	50			88.32	3	ss	5	⊕						
		End of Borehole		2.13										
3														
,														
4														
5														
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	рти с	CALE							der ciates					GGED: PAH





Record of Test Pits



RECORD OF BOREHOLE: TP 17-01

LOCATION: N 5013074.7 ;E 367831.7

BORING DATE: July 21, 2017

SHEET 1 OF 1 DATUM: Geodetic

Bit Mark SUME VIEW SUME VIEW SUME VIEW Description Provide VIEW ProvieW ProvieW ProvieW	, FE	тнор	SOIL PROFILE			SA	MPLE		HEADSPACE OF CONCENTRATION ND = Not Detected	DNS [PPM] ed]	⊕		cm/s			ING	PIEZOMETER
0 0	METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	DEPTH	NUMBER	TYPE	BLOWS/0.30m	2 4 HEADSPACE CC VAPOUR CONCI [%LEL] ND = Not	6 DMBUSTIE ENTRATIC Detected	BLE		Wp H		0 ^W	- WI	ADDITIONAL LAB. TESTING	STANDPIPE
	1	Excavator	TOPSOIL/FILL - (SM) SILTY SAND, fine to coarse, trace gravel; dark brown, contains organic matter, rootlets; non-cohesive, moist FILL - (SW) gravelly SAND, fine to coarse, angular; black, contains asphalt; non-cohesive, moist (SM) SILTY SAND, fine, trace clay; grey brown; non-cohesive (CL/CI) SILTY CLAY, trace sand; grey brown, highly fissured (WEATHERED CRUST); cohesive, w>PL		0.15	1	GRAB	5 - 6										
a b a b b b c																		
8 9																		
9	7																	
10																		
	10																	

RECORD OF BOREHOLE: TP 17-02

LOCATION: N 5013079.8 ;E 367848.4

BORING DATE: July 21, 2017

SHEET 1 OF 1

DATUM: Geodetic

Nome Nome <th< th=""><th>SALE</th><th>ТНОВ</th><th>SOIL PROFILE</th><th> ⊢</th><th></th><th>SA</th><th>MPLE</th><th></th><th>HEADSPACE CONCENTR/ ND = Not Det</th><th>TIONS [F</th><th>PM]</th><th>⊕</th><th></th><th>ULIC CO k, cm/s</th><th></th><th>2</th><th>ING</th><th>PIEZOMETER</th></th<>	SALE	ТНОВ	SOIL PROFILE	⊢		SA	MPLE		HEADSPACE CONCENTR/ ND = Not Det	TIONS [F	PM]	⊕		ULIC CO k, cm/s		2	ING	PIEZOMETER
0 0	METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	DEPTH	NUMBER	түре	BLOWS/0.30n	HEADSPACE VAPOUR CO [%LEL] <i>ND</i> =	COMBUS NCENTRA Not Detec	G STIBLE ATIONS ted		W/ Wp	ATER CO		I NT WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
		Excavator	TOPSOIL/FILL - (SM) gravelly SILTY SAND; dark brown, contains organic (matter, rootlets; non-cohesive, moist FILL - (SW) gravelly SAND, fine to coarse; dark brown to black, contains asphalt; non-cohesive (CL/CI) SILTY CLAY, trace to some sand; grey brown, highly fissured (WEATHERED CRUST); cohesive, w>PL	/	0.13		GRAB	-	•									
a b a b b b b c <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>																		
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RECORD OF BOREHOLE: TP 17-03

LOCATION: N 5013066.6 ;E 367826.6

BORING DATE: July 21, 2017

SHEET 1 OF 1

DATUM: Geodetic

S	тнор	SOIL PROFILE	1-		SA	MPL		HEADSF CONCENND = Not	PACE OR	GANIC NS [PP #	VAPOU M]	R ⊕		k, cm/s			ING	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH	NUMBER	ТҮРЕ	BLOWS/0.30m	HEADSF VAPOUF	ACE COI	MBUST	IBLE IONS		10 W/ Wp	ATER CO	PERCE	0 ⁻³ NT WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	BO		STR	(m)	z		BLO	[%LEL] / 20	VD = Not I 40	Detecte 60		0	2			30	L	
0	-	GROUND SURFACE																
	Į Į	FILL - (SW) gravely SAND, fine to coarse; dark brown to black, contains		0.07	1	GRAE		⊕										
	Excavator	asphalt, mud, concrete, brick, plastic;		0.47														
ľ	"	\non-cohesive, moist (SM) SILTY SAND, fine, trace clay; grey																
1		\brown; non-cohesive, moist to wet	/	0.80														
		(CL/CI) SILTY CLAY, trace sand; grey brown, highly fissured, thin laminations of silty sand (WEATHERED CRUST);	/															
		cohesive, w>PL End of Test Pit																
2																		
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RECORD OF BOREHOLE: TP 17-04

LOCATION: N 5013055.5 ;E 367846.2

BORING DATE: July 21, 2017

SHEET 1 OF 1 DATUM: Geodetic

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected 2 4 6 8 HYDRAULIC CONDUCTIVITY, k, cm/s SAMPLES SOIL PROFILE BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING ⊕ PIEZOMETER STRATA PLOT BLOWS/0.30m 10⁻⁶ 10⁻⁵ 10-4 10⁻³ OR NUMBER STANDPIPE INSTALLATION ELEV. ТҮРЕ HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected WATER CONTENT PERCENT DESCRIPTION DEPTH -0^W - wi Wp 🛏 (m) 20 40 60 20 40 60 80 80 GROUND SURFACE 0 ASPHALTIC CONCRETE 0.00 FILL - (SW) gravelly SAND, fine to 0.14 1 GRAB ₽ coarse, angular; dark brown to black, contains asphalt; non-cohesive, moist 0.40 Evcavator (ML/SM) sandy SILT, trace silty sand and clay; grey to grey brown, thin laminations of silty clay; non-cohesive, most 0.75 (CL/CI) SILTY CLAY, trace to some sand; grey brown, highly fissured, thin laminations of silty sand; cohesive, XX 1.15 w>PL End of Test Pit 2 3 4 5 6 7 1658448-7000.GPJ GAL-MIS.GDT 10/10/17 JEM 8 9 10 MIS-BHS 001 DEPTH SCALE LOGGED: RI Golder 1:50 CHECKED: AT ssociates

RECORD OF BOREHOLE: TP 17-05

LOCATION: N 5013001.8 ;E 367882.1

BORING DATE: July 21, 2017

SHEET 1 OF 1 DATUM: Geodetic

	DOH	SOIL PROFILE		S	AMPLES	CON	OSPACE O CENTRATI Not Detect	ONS [PF	vapouf 'M]	۲ ⊕		, cm/s			AL	PIEZOMETER
METRES	BORING METHOD	DESCRIPTION	STRATA PLOT) ad a	TH S	TYPE	HEAD VAPO	2 4 SPACE C DUR CONC L] ND = No	OMBUS ENTRA	TIBLE TIONS		10 ⁻⁶ WAT Wp H	TER CON	1	10 ⁻³ ERCENT		OR STANDPIPE INSTALLATION
	ă	GROUND SURFACE	^m all s	<u></u>		5	20 40)	20	40	60	80		
0		ASPHALTIC CONCRETE		00 08		1										
		FILL - (SM) gravelly SILTY SAND; dark brown; non-cohesive, moist		20 35												
		TOPSOIL/FILL - (SM/ML) SILTY SAND to sandy SILT, trace clay; dark brown	1. 1.	50												
		with black staining, contains organic matter; cohesive, w~PL														
1		(SM) SILTY SAND, ine, trace clay; grey; non-cohesive, moist			GRAB ·	. ₩										
	ator	(CL/CI) SILTY CLAY, trace sand; grey brown, highly fissured, thin laminations to thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL														
	Excavator	to thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL														
2				2	GRAB ·	Ð										
					GRAB ·	•										
3		End of Test Pit	3	.00]											
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υEI	-115	SCALE					Ass	older	•							ECKED: AT

RECORD OF BOREHOLE: TP 17-06

LOCATION: N 5013014.5 ;E 367869.6

BORING DATE: July 21, 2017

SHEET 1 OF 1

DATUM: Geodetic

щ	ПОН	SOIL PROFILE	1.	1	SA	MPL		HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected	⊕	HYDRAULIC CONDUCTIVITY, k, cm/s	μģ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)		TYPE	BLOWS/0.30m	2 4 6 8 HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected		10 ⁻⁶ 10 ⁻⁵ 10 ⁻⁴ 10 ⁻³ WATER CONTENT PERCENT Wp I O ^W I WI	ADDITIONAL LAB. TESTING	OR STANDPIPE INSTALLATION
	ш	GROUND SURFACE	S,			$\left \right $	ā	20 40 60 80	+	20 40 60 80	+ +	
- 0 - - 1	Excavator	FILL - (SW) gravelly SAND, angular; dark brown to black; non-cohesive, moist FILL - (SW) gravelly SAND, fine to coarse; brown; non-cohesive, wet TOPSOIL - (SM/ML) SILTY SAND TO sandy SILT, trace clay; dark brown, contains organic matter; cohesive, w>PL/ (SM) SILTY SAND, fine, trace clay; brown to grey brown; non-cohesive, moist (CL/CI) SILTY CLAY, trace to some sand; grey to grey brown, highly fissured, thin laminations to thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL		0.00 0.15 0.35 0.45		GRAE		Φ				
- 3-		End of Test Pit		3.00	3	GRAB	-	₽				
- 5												
- 6												
- 7												
- 8												
- 9												
- 10 DEF	PTH S	SCALE						Golder			LOG	GED: RI

RECORD OF BOREHOLE: TP 17-07

LOCATION: N 5012987.9 ;E 367870.3

BORING DATE: July 21, 2017

SHEET 1 OF 1

DATUM: Geodetic

Ш	ПОН	SOIL PROFILE	1.		SA	MPL			SPACE (ENTRAT lot Detec	ORGANI IONS [F	C VAPOL PPM]	JR ⊕	HYDR	AULIC C k, cm/	CONDUC B	TIVITY,		ĘŁ	PIEZOMETER
DEPTH SCALE METRES	BORING METHOD		STRATA PLOT	ELEV.	3ER	щ	BLOWS/0.30m		SPACE (4 I	1	8		1	10 ⁻⁵ 1	1	10 ⁻³	ADDITIONAL LAB. TESTING	OR STANDPIPE
DEPTI	DRING	DESCRIPTION	RATA	DEPTH	NUMBER	түре	/SMO	VAPO	JR CON ND = N	CENTR	ATIONS						WI	ADDI LAB. 7	INSTALLATION
_	B		STI	(m)	Ļ		Ē		-			30					80		
- 0		GROUND SURFACE		0.06									-		-	-			
		FILL - (SW) gravelly SAND, sub-angular; brown (PAVEMENT STRUCTURE)		0.06															
		TOPSOIL/FILL - (ML) sandy SILT, trace	Fi	0.36															
		clay; dark brown to black, contains organic matter; non-cohesive, moist		0.73															
- 1		(SM) SILTY SAND, fine, trace clay; grey to grey brown; non-cohesive, moist		0.70															
		(CL/CI) SILTY CLAY trace to some			1	GRAE	-	Ð											
	ator	sand; grey brown, highly fissured, pockets of thin laminations to thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL																	
	Excavator	cohesive, w>PL																	
					2	GRAE	-	⊕											
- 2																			
											1					1			
- 3		End of Test Pit		3.10	3	GRAE	-	Φ			1					1			
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RECORD OF BOREHOLE: TP 17-08

LOCATION: N 5012986.5 ;E 367906.5

BORING DATE: July 21, 2017

SHEET 1 OF 1 DATUM: Geodetic

\vdash		٥	SOIL PROFILE			SA	MPL	FS	HEADS	SPACE	ORGAN	C VAPOL	JR	HYDR	AULIC C	ONDUCT	FIVITY,			
DEPTH SCALE	ទួ	BORING METHOD		T					CONC ND = N	ENTRAT lot Deteo	FIONS [F	C VAPOL PM] 6	₩ ⊕ 8		k, cm/s	6		0 ⁻³	ADDITIONAL LAB. TESTING	PIEZOMETER OR
TH S(ETRE	G ME	DESCRIPTION	A PLO	ELEV.	BER	TYPE	\$/0.30			COMBU	1	0 		1	ONTENT			DITIO TES'	STANDPIPE
DEP'	Σ	ORIN	DESCRIPTION	STRATA PLOT	DEPTH (m)	NUMBER	₽	BLOWS/0.30m	VAPO	JR CON	ICENTR.	STIBLE ATIONS ted			p			WI	ADC LAB.	INSTALLATION
		ă		ST	(11)			Ы	2	0 4	40	60 E	30	2	20 4	40 E	50 E	30		
F	0		GROUND SURFACE TOPSOIL - (CL) SILTY CLAY, trace	EEE	0.00									-						
F			sand; dark brown, contains organic																	
F		Excavator	\w>PL		0.30															
E		Exce	(CL/CI) SILTY CLAY, trace sand; grey brown, highly fissured (WEATHERED CRUST); cohesive, w>PL																	
Ł	1		CRUST), conesive, w>PL			1	GRAE	-	⊕											
F	ŀ		End of Test Pit		1.10															-
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RECORD OF BOREHOLE: TP 17-09

LOCATION: N 5013008.9 ;E 367924.4

BORING DATE: July 21, 2017

SHEET 1 OF 1

DATUM: Geodetic

Ц	ПОН	SOIL PROFILE	-		SA	MPL		HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ⊕ ND = Not Detected	HYDRAULIC CONDUCTIVITY, k, cm/s	μġ	PIEZOMETER
METRES	BORING METHOD		STRATA PLOT	ELEV.	ER	_ш	BLOWS/0.30m			ZE	OR
Ш	RING	DESCRIPTION	ATA	DEPTH	NUMBER	TYPE)/S/(HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS	WATER CONTENT PERCENT	ADDI' AB. T	ISTALLATION
د	BO		STR	(m)	z		BLC	[%LEL] ND = Not Detected 20 40 60 80	20 40 60 80		
0		GROUND SURFACE									
		TOPSOIL - (CL) SILTY CLAY, trace sand; dark brown, contains organic		0.00							
		matter, rootlets; cohesive, w>PL to w~PL	A	0.25							
		(CL/CI) SILTY CLAY, trace sand; grey brown, highly fissured, thin laminations									
		to thin beds of silty sand (WEATHERED CRUST); cohesive, w>PL									
1		CRUST); cohesive, w>PL			1	GRAB	- 4	₽			
	Excavator										
	Exc				2	GRAB					
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3		End of Test Pit		3.00	3	GRAB	-				
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DF	РТН	SCALE						Golder		LOGGED	: RI
								Golder		L	

RECORD OF BOREHOLE: TP 17-10

LOCATION: N 5013034.1 ;E 367896.8

BORING DATE: July 21, 2017

SHEET 1 OF 1 DATUM: Geodetic

HEADSPACE ORGANIC VAPOUR CONCENTRATIONS [PPM] ND = Not Detected 2 4 6 8 HYDRAULIC CONDUCTIVITY, k, cm/s SOIL PROFILE SAMPLES BORING METHOD DEPTH SCALE METRES ADDITIONAL LAB. TESTING ⊕ PIEZOMETER STRATA PLOT BLOWS/0.30m 10⁻⁴ 10⁻³ 10-6 10-5 OR NUMBER STANDPIPE INSTALLATION ELEV. TYPE HEADSPACE COMBUSTIBLE VAPOUR CONCENTRATIONS [%LEL] ND = Not Detected WATER CONTENT PERCENT DESCRIPTION DEPTH _____W - wi Wp 🛏 (m) 20 40 60 80 20 40 60 80 GROUND SURFACE 0 TOPSOIL - (CL/CI) SILTY CLAY, trace 0.00 to some sand; dark brown, contains organic matter, rootlets; cohesive, w>PL (CL/CI) SILTY CLAY, trace to some sand; grey brown, highly fissured (WEATHERED CRUST); cohesive, w>PL 0.30 -vcavator 1 GRAB - ₽ End of Test Pit 1.00 2 3 4 5 6 7 1658448-7000.GPJ GAL-MIS.GDT 10/10/17 JEM 8 9 10 MIS-BHS 001 DEPTH SCALE LOGGED: RI Golder 1:50 CHECKED: AT sociates



APPENDIX C

Laboratory Certificates of Analysis





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

ATTENTION TO: Alyssa Troke

PROJECT: 1658448 - River Rd Phase 2 ESA

AGAT WORK ORDER: 17Z180001

SOIL ANALYSIS REVIEWED BY: Elizabeth Polakowska, MSc (Animal Sci), PhD (Agri Sci), Inorganic Lab Supervisor

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

DATE REPORTED: Feb 10, 2017

PAGES (INCLUDING COVER): 12

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 (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 12

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECEIVED: 2017-01-20

DATE RECEIVED. 2017-01-20	0				DATE REPORTED. 2017
	S	AMPLE DESCR	IPTION:	BH 17-32 SA2	
		SAMPL	E TYPE:	Soil	
		DATE SA	MPLED:	2017-01-13	
Parameter	Unit	G/S	RDL	8139183	
Antimony	µg/g	7.5	0.8	<0.8	
Arsenic	µg/g	18	1	4	
Boron	µg/g	120	5	7	
Barium	µg/g	390	2	303	
Beryllium	µg/g	4	0.5	1.0	
Cadmium	µg/g	1.2	0.5	<0.5	
Chromium	µg/g	160	2	83	
Cobalt	µg/g	22	0.5	20.3	
Copper	µg/g	140	1	36	
Lead	µg/g	120	1	10	
Molybdenum	µg/g	6.9	0.5	<0.5	
Nickel	hð/ð	100	1	48	
Selenium	µg/g	2.4	0.4	<0.4	
Silver	µg/g	20	0.2	<0.2	
Thallium	hð/ð	1	0.4	<0.4	
Uranium	hð/ð	23	0.5	0.8	
Vanadium	hð/ð	86	1	76	
Zinc	hð/ð	340	5	107	

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

Certified By:

Elizabeth Rolokowska

DATE REPORTED: 2017-02-10

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



AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

DATE REPORTED: 2017-02-10

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil) - EC/SAR

DATE RECEIVED: 2017-01-20

	:	SAMPLE DES	CRIPTION:	BH 17-30 SA2	BH 17-31 SA2	BH 17-32 SA2
		SAM	PLE TYPE:	Soil	Soil	Soil
		DATE	SAMPLED:	2017-01-13	2017-01-13	2017-01-13
Parameter	Unit	G/S	RDL	8139178	8139179	8139183
Electrical Conductivity	mS/cm	0.7	0.005	2.38	2.42	0.958
Sodium Adsorption Ratio	NA	5	NA	47.8	42.5	3.69

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

8139178-8139183 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

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

Certified By:

Elizabeth Rolokowska



AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECEIVED: 2017-01-20

		SAMPLE DESC	RIPTION:	BH 17-32 SA2	
		SAMP	LE TYPE:	Soil	
		DATE S	AMPLED:	2017-01-13	
Parameter	Unit	G/S	RDL	8139183	
Naphthalene	µg/g	0.6	0.05	<0.05	
Acenaphthylene	µg/g	0.15	0.05	<0.05	
Acenaphthene	µg/g	7.9	0.05	<0.05	
Fluorene	µg/g	62	0.05	<0.05	
Phenanthrene	µg/g	6.2	0.05	<0.05	
Anthracene	µg/g	0.67	0.05	<0.05	
Fluoranthene	µg/g	0.69	0.05	<0.05	
Pyrene	µg/g	78	0.05	<0.05	
Benz(a)anthracene	µg/g	0.5	0.05	<0.05	
Chrysene	µg/g	7	0.05	<0.05	
Benzo(b)fluoranthene	µg/g	0.78	0.05	<0.05	
Benzo(k)fluoranthene	µg/g	0.78	0.05	<0.05	
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	
Indeno(1,2,3-cd)pyrene	µg/g	0.38	0.05	<0.05	
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	
Benzo(g,h,i)perylene	µg/g	6.6	0.05	<0.05	
2-and 1-methyl Naphthalene	µg/g	0.99	0.05	<0.05	
Surrogate	Unit	Acceptabl	e Limits		
Chrysene-d12	%	50-1	40	84	

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

8139183 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:

teus

DATE REPORTED: 2017-02-10



AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

DATE REPORTED: 2017-02-10

SAMPLED BY:

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

DATE RECEIVED: 2017-01-20

		SAMPLE DES	CRIPTION:	BH 17-30 SA2	BH 17-31 SA2	
		SAM	PLE TYPE:	Soil	Soil	
		DATES	SAMPLED:	2017-01-13	2017-01-13	
Parameter	Unit	G/S	RDL	8139178	8139179	
Benzene	µg/g	0.21	0.02	<0.02	<0.02	
Toluene	µg/g	2.3	0.08	<0.08	<0.08	
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	
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	<50	<50	
F4 (C34 to C50)	µg/g	2800	50	<50	<50	
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	
Moisture Content	%		0.1	24.1	30.2	
Surrogate	Unit	Acceptab	le Limits			
Terphenyl	%	60-1	140	96	122	

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

8139178-8139179 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:

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

http://www.agatlabs.com

CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

NTION TO: Alvssa Troke

DATE REPORTED: 2017-02-10

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

5835 COOPERS AVENUE

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECEIVED: 2017-01-20

		SAMPLE DESCRIPT	TION: BH 17-32 SA2
		SAMPLE T	YPE: Soil
		DATE SAMP	LED: 2017-01-13
Parameter	Unit	G/S RI	DL 8139183
Benzene	µg/g	0.21 0.	02 <0.02
Toluene	µg/g	2.3 0.	08 <0.08
Ethylbenzene	µg/g	2 0.	05 <0.05
Xylene Mixture	µg/g	3.1 0.0	05 <0.05
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 1	0 <10
F2 (C10 to C16) minus Naphthalene	µg/g	1	0 <10
F3 (C16 to C34)	µg/g	300 5	0 <50
F3 (C16 to C34) minus PAHs	µg/g	5	0 <50
F4 (C34 to C50)	µg/g	2800 5	0 <50
Gravimetric Heavy Hydrocarbons	µg/g	2800 5	0 NA
Moisture Content	%	0	.1 29.0
Surrogate	Unit	Acceptable Lin	nits
Terphenyl	%	60-140	94

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

8139183 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:



Guideline Violation

AGAT WORK ORDER: 17Z180001 PROJECT: 1658448 - River Rd Phase 2 ESA 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alyssa Troke

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8139178	BH 17-30 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil) - EC/SAR	Electrical Conductivity	mS/cm	0.7	2.38
8139178	BH 17-30 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil) - EC/SAR	Sodium Adsorption Ratio	NA	5	47.8
8139179	BH 17-31 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil) - EC/SAR	Electrical Conductivity	mS/cm	0.7	2.42
8139179	BH 17-31 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil) - EC/SAR	Sodium Adsorption Ratio	NA	5	42.5
8139183	BH 17-32 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil) - EC/SAR	Electrical Conductivity	mS/cm	0.7	0.958



Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - River Rd Phase 2 ESA

SAMPLING SITE:

AGAT WORK ORDER: 17Z180001 ATTENTION TO: Alyssa Troke SAMPLED BY:

Soil Analysis

RPT Date: Feb 10, 2017			C	UPLICAT	E		REFEREN	ICE MA	TERIAL	METHOD	BLAN	SPIKE	MATRIX SPIKE		
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery		ptable nits	Recovery	Lin	ptable nits
		ľů					value	Lower	Upper	_	Lower	Upper	_	Lower	Uppe
O. Reg. 153(511) - Metals (Inc	luding Hydride	s) (Soil)													
Antimony	8146881		<0.8	<0.8	NA	< 0.8	130%	70%	130%	85%	80%	120%	86%	70%	1309
Arsenic	8146881		5	5	0.0%	< 1	113%	70%	130%	101%	80%	120%	101%	70%	1309
Boron	8146881		6	6	NA	< 5	84%	70%	130%	101%	80%	120%	101%	70%	1309
Barium	8146881		80	77	3.8%	< 2	100%	70%	130%	103%	80%	120%	98%	70%	130%
Beryllium	8146881		<0.5	<0.5	NA	< 0.5	95%	70%	130%	105%	80%	120%	101%	70%	130%
Cadmium	8146881		<0.5	<0.5	NA	< 0.5	110%	70%	130%	103%	80%	120%	101%	70%	130%
Chromium	8146881		11	11	0.0%	< 2	93%	70%	130%	105%	80%	120%	99%	70%	130%
Cobalt	8146881		4.0	4.0	0.0%	< 0.5	99%	70%	130%	104%	80%	120%	101%	70%	130%
Copper	8146881		19	19	0.0%	< 1	97%	70%	130%	108%	80%	120%	102%	70%	130%
Lead	8146881		166	175	5.3%	< 1	110%	70%	130%	107%	80%	120%	98%	70%	130%
Molybdenum	8146881		<0.5	<0.5	NA	< 0.5	109%	70%	130%	99%	80%	120%	103%	70%	130%
Nickel	8146881		9	9	0.0%	< 1	98%	70%	130%	104%	80%	120%	99%	70%	130%
Selenium	8146881		0.6	0.5	NA	< 0.4	88%	70%	130%	102%	80%	120%	99%	70%	130%
Silver	8146881		<0.2	<0.2	NA	< 0.2	94%	70%	130%	105%	80%	120%	103%	70%	130%
Thallium	8146881		<0.4	<0.4	NA	< 0.4	101%	70%	130%	105%	80%	120%	101%	70%	130%
Uranium	8146881		<0.5	<0.5	NA	< 0.5	104%	70%	130%	97%	80%	120%	95%	70%	130%
Vanadium	8146881		20	20	0.0%	< 1	101%	70%	130%	104%	80%	120%	102%	70%	130%
Zinc	8146881		129	130	0.8%	< 5	104%	70%	130%	108%	80%	120%	102%	70%	130%
Comments:															
O. Reg. 153(511) - ORPs (Soil) - EC/SAR														
Electrical Conductivity	8170448		0.331	0.333	0.6%	< 0.005	93%	90%	110%	NA			NA		
Sodium Adsorption Ratio	8139660		3.82	3.75	1.8%	NA	NA			NA			NA		
Comments: NA signifies Not App Duplicate Qualifier: As the measure where the average of the two dup	ured result appro				associated	d with the v	alue incre	ases dr	amatic	ally, thus c	luplicat	e accep	tance limit	s apply	[,] only

O. Reg. 153(511) - ORPs (Soil) - EC/SAR

Electrical Conductivity	8169778	0.141	0.137	2.9%	< 0.005	93%	90% 110%	NA	NA
Sodium Adsorption Ratio	8169778	0.172	0.179	4.0%	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:

Elizabeth Rolakowska

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 8 of 12



Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - River Rd Phase 2 ESA

SAMPLING SITE:

AGAT WORK ORDER: 17Z180001 ATTENTION TO: Alyssa Troke SAMPLED BY:

Trace Organics Analysis

							y -								
RPT Date: Feb 10, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD	BLAN		МАТ	KE	
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	1 15	eptable mits	Recovery	Lir	ptable nits
		Id					value	Lower	Upper		Lower	Upper		Lower	Uppe
O. Reg. 153(511) - PHCs F1 - F	4 (Soil)														
Benzene	8143214		< 0.02	< 0.02	NA	< 0.02	98%	60%	130%	100%	60%	130%	102%	60%	130%
Toluene	8143214		< 0.08	< 0.08	NA	< 0.08	86%	60%	130%	85%	60%	130%	92%	60%	130%
Ethylbenzene	8143214		< 0.05	< 0.05	NA	< 0.05	77%	60%	130%	80%	60%	130%	92%	60%	130%
Xylene Mixture	8143214		< 0.05	< 0.05	NA	< 0.05	75%	60%	130%	77%	60%	130%	80%	60%	130%
F1 (C6 to C10)	8143214		< 5	< 5	NA	< 5	74%	60%	130%	87%	85%	115%	77%	70%	130%
F2 (C10 to C16)	8144542		< 10	< 10	NA	< 10	101%	60%	130%	80%	80%	120%	98%	70%	130%
F3 (C16 to C34)	8144542		< 50	< 50	NA	< 50	105%	60%	130%	82%	80%	120%	87%	70%	130%
F4 (C34 to C50)	8144542		< 50	< 50	NA	< 50	103%	60%	130%	95%	80%	120%	93%	70%	130%
O. Reg. 153(511) - PAHs (Soil)															
Naphthalene	8120231		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	112%	50%	140%	90%	50%	140%
Acenaphthylene	8120231		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	103%	50%	140%	87%	50%	140%
Acenaphthene	8120231		< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	104%	50%	140%	88%	50%	140%
Fluorene	8120231		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	100%	50%	140%	89%	50%	140%
Phenanthrene	8120231		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	92%	50%	140%	91%	50%	140%
Anthracene	8120231		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	111%	50%	140%	86%	50%	140%
Fluoranthene	8120231		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	94%	50%	140%	103%	50%	140%
Pyrene	8120231		< 0.05	< 0.05	NA	< 0.05	95%	50%	140%	90%	50%	140%	104%	50%	140%
Benz(a)anthracene	8120231		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	62%	50%	140%	115%	50%	140%
Chrysene	8120231		< 0.05	< 0.05	NA	< 0.05	74%	50%	140%	76%	50%	140%	105%	50%	140%
Benzo(b)fluoranthene	8120231		< 0.05	< 0.05	NA	< 0.05	87%	50%	140%	117%	50%	140%	89%	50%	140%
Benzo(k)fluoranthene	8120231		< 0.05	< 0.05	NA	< 0.05	109%	50%	140%	108%	50%	140%	77%	50%	140%
Benzo(a)pyrene	8120231		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	115%	50%	140%	100%	50%	140%
Indeno(1,2,3-cd)pyrene	8120231		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	97%	50%	140%	104%	50%	140%
Dibenz(a,h)anthracene	8120231		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	90%	50%	140%	100%	50%	140%
Benzo(g,h,i)perylene	8120231		< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	118%	50%	140%	111%	50%	140%
2-and 1-methyl Naphthalene	8120231		< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	107%	50%	140%	88%	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:

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - River Rd Phase 2 ESA

AGAT WORK ORDER: 17Z180001 ATTENTION TO: Alyssa Troke

SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Soil Analysis	•	1							
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						
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 6010C	ICP/OES						



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - River Rd Phase 2 ESA

AGAT WORK ORDER: 17Z180001 ATTENTION TO: Alyssa Troke SAMPLED BY:

SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Trace Organics Analysis		1							
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						
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						
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	GRAVIMETRIC ANALYSIS						

Chain of C				_			<u>A</u>		712.5	ssaug 100 webe	35 Coope a, Ontari Fax: 905 earth.aga	0 L4Z 1 712.51 Itlabs.co	Y2 22 0m	W Ce	ork O	rato Irder # Quant Temp	tity:	17	Z	12	518	20L	el	0
Report Inform Company:	nation: Golder P	teoriates			sample, please	e use Drinking Water Chain of Regulatory Requ (Please check all applicable baxes	irements:				ory Rec	_				y Sea		×.	e	7 Yes		73]No	16	
Contact: Alyper Trake Keith Holmes Address: 1931 Pobertson Pd. Phone: 613-592-9600 Fax: Reports to be sent to: 1. Email: Atroke Ogolder.com 2. Email: Khalmes Ogolder.com					Table Indicate One Sanitary Ind/Com Sanitary CCME Agriculture Storm Prov. Water Quality Objectives (PWQO) Soil Texture (check One) Region Indicate One Indicate One Other					Turnaround Time (TAT) Required: Regular TAT 5 to 7 Business Days Rush TAT (Rush Surcharges Apply) 2 Business 1 Business 3 Business 2 Business Days 1 Business Days Days Days 1 Business														
Project Inform Project: Site Location: Sampled By:				Rd.P	have 11 E	Is this submissio	ndition?			Icate	uidelin e of An	e on			13	Ple	ease	provi	de pri	ior no	Surcharge: tification ds and st	for rus	sh TAT	-
AGAT Quote #: Invoice Inform Company: Contact: Address: Email:	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 Y No Company: Contact: Address:			Sample Matrix Legend B Biota GW Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	Field Filtered - Metals, Hg, CrVI (Please Circle)	Metals and Inorganics	Metal Scan Hvdride Forming Metals	tals	ORPs: B+HWS CI: CN: C C PS: Ec Foc NO2/NO2 Total N Hg D H SAR	HN D		CUME FRACTIONS 1 10 4 /B/EX		henols		Organochlorine Pesticides	TCLP Metals/Inorganics	Jse						
Sample Ide	entification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Metals	Metal Scan Hvdride For	Client C	ORPs: 0 Cr ⁶⁺ 0 Total	Nutrien	Volatiles:	ABNS	PAHs	Chlorophenols	PCBs	Organo	TCLP M	Sewer Use	SAR			
BH17-30 BH17-31 BH17-32	SAZ	Jan-13/17		333	5 5	20 metals			×						×	•								
Samples Retinquished by (Pr Samples Kengguished by pr Samples Retinquished by (Pr		indlate		Dato Jan. 20 Date Date	- 17 Time - 17 Time - 17 Time Time	30 130 130 Samples Received By (P Samples Received By (P	rint Name and Sign):		le	4	1	90	Date Date	2-1	7	Turne 9	h5 32	50 7	N°:	_	age /	of 31	/ 59	



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

ATTENTION TO: Alyssa Troke

PROJECT: 1658448 Riverside South Ph. 2

AGAT WORK ORDER: 17Z182021

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

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

DATE REPORTED: Feb 06, 2017

PAGES (INCLUDING COVER): 15

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 (V1)

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Page 1 of 15

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:Alyssa Troke

				0 . nog.	100(011) /		5011)		
DATE RECEIVED: 2017-01-27									DATE REPORTED: 2017-02-06
		SAMPLE DESCI	RIPTION:	BH17-29 SA2	BH17-33 SA2	FP1 SA1	FP2 SA2	BH17-8 SA1	
		SAMPL	E TYPE:	Soil	Soil	Soil	Soil	Soil	
		DATE SA	MPLED:	2017-01-23	2017-01-23	2017-01-23	2017-01-23	2017-01-23	
Parameter	Unit	G / S	RDL	8153709	8153711	8153714	8153717	8153721	
Antimony	µg/g	7.5	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	
Arsenic	µg/g	18	1	1	2	2	5	3	
Barium	µg/g	390	2	48	123	59	57	61	
Beryllium	µg/g	4	0.5	<0.5	0.6	<0.5	<0.5	<0.5	
Boron	µg/g	120	5	<5	<5	<5	7	7	
Boron (Hot Water Soluble)	µg/g	1.5	0.10	<0.10	0.14	0.71	0.13	0.15	
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Chromium	µg/g	160	2	19	42	17	13	10	
Cobalt	µg/g	22	0.5	5.3	10.1	4.2	6.9	4.7	
Copper	µg/g	140	1	5	21	11	11	11	
_ead	µg/g	120	1	3	5	12	28	8	
Volybdenum	µg/g	6.9	0.5	<0.5	<0.5	0.7	3.3	1.3	
Nickel	µg/g	100	1	11	24	9	13	11	
Selenium	µg/g	2.4	0.4	<0.4	0.5	0.5	<0.4	<0.4	
Silver	µg/g	20	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	
Uranium	µg/g	23	0.5	0.9	0.6	0.8	0.6	<0.5	
Vanadium	µg/g	86	1	33	53	25	32	37	
Zinc	µg/g	340	5	25	42	51	20	29	
Chromium VI	µg/g	8	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
Mercury	µg/g	0.27	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	

O. Reg. 153(511) - All Metals (Soil)

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

Certified By:

Amanjot Bhela



AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:Alyssa Troke

DATE RECEIVED: 2017-01-27									DATE REPORTED: 2017-02-06
		SAMPLE DESCH	RIPTION:	BH17-29 SA2	BH17-33 SA2	FP1 SA1	FP2 SA2	BH17-8 SA1	
		SAMPL	E TYPE:	Soil	Soil	Soil	Soil	Soil	
		DATE SA	MPLED:	2017-01-23	2017-01-23	2017-01-23	2017-01-23	2017-01-23	
Parameter	Unit	G / S	RDL	8153709	8153711	8153714	8153717	8153721	
Naphthalene	µg/g	0.6	0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	
Acenaphthylene	µg/g	0.15	0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	
Acenaphthene	µg/g	7.9	0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	
Fluorene	µg/g	62	0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	
Phenanthrene	µg/g	6.2	0.05	<0.05	<0.05	<0.05	<0.05	< 0.05	
Anthracene	µg/g	0.67	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluoranthene	µg/g	0.69	0.05	<0.05	<0.05	0.10	<0.05	<0.05	
Pyrene	µg/g	78	0.05	<0.05	< 0.05	0.09	<0.05	<0.05	
Benz(a)anthracene	µg/g	0.5	0.05	<0.05	< 0.05	0.05	<0.05	<0.05	
Chrysene	µg/g	7	0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	
Benzo(b)fluoranthene	µg/g	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo(k)fluoranthene	µg/g	0.78	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo(a)pyrene	µg/g	0.3	0.05	<0.05	< 0.05	<0.05	<0.05	<0.05	
Indeno(1,2,3-cd)pyrene	µg/g	0.38	0.05	<0.05	< 0.05	< 0.05	<0.05	< 0.05	
Dibenz(a,h)anthracene	µg/g	0.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo(g,h,i)perylene	µg/g	6.6	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
2-and 1-methyl Naphthalene	µg/g	0.99	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Moisture Content	%		0.1	13.6	20.8	26.0	6.6	6.4	
Surrogate	Unit	Acceptable	Limits						
Chrysene-d12	%	50-14	0	57	62	52	101	81	

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

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

8153709-8153721 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 WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 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

SAMPLING SITE:

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

DATE RECEIVED: 2017-01-27

DATE REPORTED: 2017-02-06

		SAMPLE DES	CRIPTION:	FP1 SA1	FP2 SA2	BH17-8 SA1
		SAM	PLE TYPE:	Soil	Soil	Soil
		DATES	SAMPLED:	2017-01-23	2017-01-23	2017-01-23
Parameter	Unit	G/S	RDL	8153714	8153717	8153721
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g	55	5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10	<10
F3 (C16 to C34)	µg/g	300	50	58	920	1100
F3 (C16 to C34) minus PAHs	µg/g		50	58	920	1100
F4 (C34 to C50)	µg/g	2800	50	<50	1800	1500
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA
Moisture Content	%		0.1	26.0	6.6	6.4
Surrogate	Unit	Acceptab	le Limits			
Terphenyl	%	60-1	40	120	120	83

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

8153714-8153721 Results are based on sample dry weight.

The C6-C10 fraction is calculated using toluene response factor.

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:

The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.



AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 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

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY: Alyssa Troke

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

DATE RECEIVED: 2017-01-27

		SAMPLE DESC	RIPTION:	BH17-29 SA2	BH17-33 SA2
		SAMF	LE TYPE:	Soil	Soil
		DATE S	AMPLED:	2017-01-23	2017-01-23
Parameter	Unit	G / S	RDL	8153709	8153711
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
F2 (C10 to C16) minus Naphthalene	µg/g		10	<10	<10
F3 (C16 to C34)	µg/g	300	50	<50	<50
F3 (C16 to C34) minus PAHs	µg/g		50	<50	<50
F4 (C34 to C50)	µg/g	2800	50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA
Moisture Content	%		0.1	13.6	20.8
Surrogate	Unit	Acceptabl	e Limits		
Terphenyl	%	60-1	40	90	91

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

8153709-8153711 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:

DATE REPORTED: 2017-02-06



AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY: Alyssa Troke

DATE RECEIVED: 2017-01-27 DATE REPORTED: 2017-02-06 SAMPLE DESCRIPTION: BH17-29 SA2 BH17-33 SA2 SAMPLE TYPE: Soil Soil DATE SAMPLED: 2017-01-23 2017-01-23 G/S RDL 8153709 8153711 Parameter Unit Dichlorodifluoromethane 16 0.05 < 0.05 < 0.05 µg/g Vinyl Chloride 0.02 0.02 < 0.02 < 0.02 ug/g Bromomethane 0.05 0.05 < 0.05 ug/g < 0.05 4 0.05 < 0.05 Trichlorofluoromethane < 0.05 ug/g Acetone 16 0.50 <0.50 < 0.50 ug/g 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 0.75 0.05 < 0.05 < 0.05 ug/g 1,1-Dichloroethane 3.5 0.02 < 0.02 < 0.02 ug/g Methyl Ethyl Ketone ug/g 16 0.50 < 0.50 < 0.50 Cis- 1,2-Dichloroethylene 3.4 0.02 < 0.02 < 0.02 ug/g Chloroform 0.05 0.04 < 0.04 < 0.04 ug/g 0.05 0.03 < 0.03 < 0.03 1.2-Dichloroethane ug/g 1,1,1-Trichloroethane 0.38 0.05 < 0.05 < 0.05 ug/g 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 0.05 0.03 < 0.03 < 0.03 ug/g Trichloroethylene ug/g 0.061 0.03 < 0.03 < 0.03 Bromodichloromethane ug/g 13 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 2.3 0.05 < 0.05 < 0.05 ug/g Dibromochloromethane ug/g 9.4 0.05 < 0.05 < 0.05 Ethylene Dibromide ug/g 0.05 0.04 < 0.04 < 0.04 0.28 0.05 < 0.05 < 0.05 Tetrachloroethylene ug/g 1,1,1,2-Tetrachloroethane 0.058 0.04 < 0.04 ug/g < 0.04 Chlorobenzene ug/g 2.4 0.05 < 0.05 < 0.05 2 Ethylbenzene ug/g 0.05 < 0.05 < 0.05

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

Certified By:

four

ug/g

m & p-Xylene

< 0.05

0.05

< 0.05



AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY: Alyssa Troke

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

DATE RECEIVED: 2017-01-27

BRIE RECEIVED. 2011 01 21						DATE NET ONTED. 2017 02 00
	S	AMPLE DESCR	RIPTION:	BH17-29 SA2	BH17-33 SA2	
		SAMPL	E TYPE:	Soil	Soil	
		DATE SA	MPLED:	2017-01-23	2017-01-23	
Parameter	Unit	G/S	RDL	8153709	8153711	
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	3.4	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)	119	85	
4-Bromofluorobenzene	% Recovery	50-140)	82	88	

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

8153709-8153711 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.

DATE REPORTED: 2017-02-06



Guideline Violation

AGAT WORK ORDER: 17Z182021 PROJECT: 1658448 Riverside South Ph. 2 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

ATTENTION TO: Alyssa Troke

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8153717	FP2 SA2	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)	F3 (C16 to C34)	µg/g	300	920
8153721	BH17-8 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (with PAHs) (Soil)	F3 (C16 to C34)	µg/g	300	1100



Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

SAMPLING SITE:

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke SAMPLED BY: Alyssa Troke

Soil Analysis

			001		219010									
RPT Date: Feb 06, 2017		[DUPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		eptable mits	Recovery	1 15	ptable nits	Recovery	1 1 1 1	ptable nits
	IC IC					Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Soil)													
Antimony	8153088	<0.8	<0.8	NA	< 0.8	104%	70%	130%	102%	80%	120%	99%	70%	130%
Arsenic	8153088	4	4	NA	< 1	102%	70%	130%	93%	80%	120%	92%	70%	130%
Barium	8153088	63	69	9.1%	< 2	94%	70%	130%	101%	80%	120%	112%	70%	130%
Beryllium	8153088	0.7	0.7	NA	< 0.5	94%	70%	130%	91%	80%	120%	94%	70%	130%
Boron	8153088	<5	<5	NA	< 5	70%	70%	130%	92%	80%	120%	82%	70%	130%
Boron (Hot Water Soluble)	8157245	0.84	0.81	3.6%	< 0.10	122%	60%	140%	102%	70%	130%	99%	60%	140%
Cadmium	8153088	<0.5	<0.5	NA	< 0.5	98%	70%	130%	100%	80%	120%	98%	70%	130%
Chromium	8153088	22	23	4.4%	< 2	94%	70%	130%	103%	80%	120%	98%	70%	130%
Cobalt	8153088	12.2	12.4	1.6%	< 0.5	96%	70%	130%	98%	80%	120%	100%	70%	130%
Copper	8153088	21	21	0.0%	< 1	87%	70%	130%	97%	80%	120%	95%	70%	130%
Lead	8153088	15	16	6.5%	< 1	105%	70%	130%	99%	80%	120%	95%	70%	130%
Molybdenum	8153088	<0.5	0.5	NA	< 0.5	103%	70%	130%	103%	80%	120%	101%	70%	130%
Nickel	8153088	21	21	0.0%	< 1	102%	70%	130%	101%	80%	120%	102%	70%	130%
Selenium	8153088	0.6	0.5	NA	< 0.4	86%	70%	130%	95%	80%	120%	83%	70%	130%
Silver	8153088	<0.2	<0.2	NA	< 0.2	87%	70%	130%	103%	80%	120%	95%	70%	130%
Thallium	8153088	<0.4	<0.4	NA	< 0.4	120%	70%	130%	110%	80%	120%	107%	70%	130%
Uranium	8153088	0.7	0.7	NA	< 0.5	106%	70%	130%	101%	80%	120%	102%	70%	130%
Vanadium	8153088	31	32	3.2%	< 1	104%	70%	130%	103%	80%	120%	104%	70%	130%
Zinc	8153088	63	64	1.6%	< 5	89%	70%	130%	100%	80%	120%	95%	70%	130%
Chromium VI	8153721 8153721	<0.2	<0.2	NA	< 0.2	95%	70%	130%	101%	80%	120%	95%	70%	130%
Mercury	8153088	<0.10	<0.10	NA	< 0.10	108%	70%	130%	96%	80%	120%	99%	70%	130%

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 QUALITY ASSURANCE REPORT (V1)

Page 9 of 15

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

SAMPLING SITE:

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke SAMPLED BY: Alyssa Troke

Trace Organics Analysis

D. Reg. 153(511) - VOCk (Soli) Districted Bisspiral Bisspiral Biss				Trac	eOr	ganio	CS AI	arysi	S							
PARAMETER Batch Sample B Dup #1 Pup #2 PRD Blank Measures Male Limits Lower Peccary Limits L	RPT Date: Feb 06, 2017			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
C. Reg. 153(51) + VOCS (S0I) Lower Upper Lower Upper Lower Upper Lower Upper Lower Lower <thlower< th=""> <thl< th=""><th>PARAMETER</th><th>Batch</th><th></th><th>Dup #1</th><th>Dup #2</th><th>RPD</th><th></th><th></th><th></th><th></th><th>Recovery</th><th></th><th></th><th>Recovery</th><th>1 1 10</th><th></th></thl<></thlower<>	PARAMETER	Batch		Dup #1	Dup #2	RPD					Recovery			Recovery	1 1 10	
Dichlorodilluoromethane B153711 B153711 C.0.5 C.0.5 NA C.0.6 B44% S0% 10% S0%								Value	Lower	Upper		Lower	Upper		Lower	Upper
Vinyl Chordia 8153711	O. Reg. 153(511) - VOCs (Soil)															
Bromomethane Trichlorodituoromethane 8153711 8153711 8153711 8153711 0.05 0.05 NA 0.05 11% 50% 140% 96% 50% 140% 97% 50% 1 1,1-Dichlorodethylene 1,1-Dichloroethylene Methylene Chloride Trans-12-Dichloroethylene 1,1-Dichloroethylene 1,1-Dichloroethylene 1,1-Dichloroethylene 8153711 8153711 0.005 0.005 NA 0.005 104% 50% 140% 96% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 83% 50% 130% 130% 130% 130% 130% 130% 130% 130% 130% 131% 13	Dichlorodifluoromethane	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	105%	50%	140%	96%	50%	140%
Trichlorofluoromethane 8153711 c0.05 c0.05 NA c0.05 118% 50% 140% 96% 50% 140% 70% 50% 1 1.1-Dichloroethylene 8153711 8153711 c0.05 c0.05 NA c0.05 100% 50% 140% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 60% 10% 81% 50% 1 10% 81% 60% 10% 81% 50% 1 10% 50% 10% 81% 50% 10% 81% 50% 10% 10% 50% 10% 10% 50% 10% 10% 50% 10% 10% 10% 50% 10% 10% 10% 10% 50%	Vinyl Chloride	8153711 8	3153711	< 0.02	< 0.02	NA	< 0.02	106%	50%	140%	113%	50%	140%	84%	50%	140%
Acetone 8153711 <0.50 <0.50 NA <0.50 108% 50% 140% 94% 50% 140% 87% 50% 1 1.1-Dichloroethylene 8153711 8153711 <0.05	Bromomethane	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	111%	50%	140%	103%	50%	140%	77%	50%	140%
1-Dichloroethylene 8153711 8153711 <0.05 <0.05 NA <0.05 98% 50% 140% 80% 60% 130% 83% 50% 1 Methylene Chloride 8153711 8153711 <0.05	Trichlorofluoromethane	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	118%	50%	140%	96%	50%	140%	70%	50%	140%
Mathylene Chloride 8153711 8153711 <0.05 <0.05 NA <0.05 98% 50% 140% 60% 130% 88% 50% 1 Trans-1,2-Dichloroethylene 8153711 8153711 <0.05	Acetone	8153711 8	3153711	< 0.50	< 0.50	NA	< 0.50	108%	50%	140%	94%	50%	140%	87%	50%	140%
Trans-1,2-Dichloroethylene B153711 B153711 Clos Clos NA < 0.05 B0% 50% 140% 88% 60% 130% 88% 50% 140% 88% 60% 130% 88% 50% 140% 88% 60% 130% 88% 50% 140% 88% 60% 130% 88% 50% 140% 88% 60% 130% 88% 50% 140% 83% 60% 130% 88% 50% 140% 83% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 60% 130% 101% 50% 140% 104% 60% 130% 101% 50% 140% 104% 60% 130% 101% 50% 140% 104% 101% 60%	1,1-Dichloroethylene	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	104%	50%	140%	86%	60%	130%	83%	50%	140%
Methyl terl-butyl Ether 8153711 8153711 8153711 < 0.05 NA < 0.05 79% 50% 140% 86% 60% 130% 87% 50% 1 Methyl Ethyl Ketone 8153711 8153711 <	Methylene Chloride	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	98%	50%	140%	114%	60%	130%	118%	50%	140%
Methyl terl-bulyl Ether 8153711 8153711 8153711 < 0.05 NA < 0.05 79% 50% 140% 86% 60% 130% 87% 50% 1 Methyl Ethyl Ketone 8153711 8153711 <	Trans- 1,2-Dichloroethylene	8153711 8	3153711	< 0.05		NA			50%	140%		60%	130%	88%	50%	140%
Methyl Ethyl Ketone 8153711 8153711 <0.50 <0.50 NA <0.50 106% 50% 140% 60% 104% 60% 104% 60% 104% 60% 103% 50% 104% 60% 103% 50% 103% 50% 103% 50% 103% 50% 103% 50% 103% 50% 103% 50% 103% 60% 103% 50% 103% 60% 103% 103% 50% 103% 60% 103% 103% 50% 103% 60% 103% 103% 60% 103% 103% 60% 103% 103% 60% 103% 103% 60% 103% 103% 60% 103% 103% 103% 60% 103% 103% 102% 50% 140% 104% 60% 103% 102% 50% 140% 104% 60% 103% 102% 50% 140% 103% 102% 50% 140% 103% 102% 50% </td <td>Methyl tert-butyl Ether</td> <td>8153711 8</td> <td>3153711</td> <td>< 0.05</td> <td></td> <td>NA</td> <td></td> <td>79%</td> <td>50%</td> <td>140%</td> <td></td> <td>60%</td> <td>130%</td> <td>88%</td> <td>50%</td> <td>140%</td>	Methyl tert-butyl Ether	8153711 8	3153711	< 0.05		NA		79%	50%	140%		60%	130%	88%	50%	140%
Cis-1,2-Dichloroethylene 8153711 8153711 <0.02 <0.02 NA <0.02 90% 50% 140% f0% f0% 130% 130% 130% 50% 1 Chloroothane 8153711 8153711 815371 <0.03	1,1-Dichloroethane	8153711 8	3153711	< 0.02	< 0.02	NA	< 0.02	90%	50%	140%	93%	60%	130%	87%	50%	140%
Cis-1,2-Dichloroethylene 8153711 815371 <0.02 <0.02 NA <0.02 90% 50% 140% f0% f0% f10% f0% f10% f0% f10% f0% f10% f10% f0% f10% f0% f10% f0% f10% f0% f10% f10% f0% f10% f10% f10% f0% f10% f10% f10% f0% f10% f10% <th10%< th=""> f10% <th10%< th=""></th10%<></th10%<>	Methyl Ethyl Ketone	8153711 8	3153711	< 0.50	< 0.50	NA	< 0.50	106%	50%	140%	89%	50%	140%	104%	50%	140%
Chloroform 8153711 8153711 < 0.04 < 0.04 NA < 0.04 96% 50% 140% 77% 60% 130% 101% 50% 1 1,2-Dichloroethane 8153711 8153711 < 0.05																140%
1.2-Dichloroethane 8153711 8153711 < 0.03	, ,															140%
1,1,1-Trichloroethane 8153711 8153711 < 0.05 < 0.05 NA < 0.05 107% 50% 140% 114% 60% 130% 121% 50% 1 Carbon Tetrachloride 8153711 8153711 < 0.05																140%
Benzene 8153711 8153711 <0.02	,															140%
Benzene 8153711 8153711 <0.02	Carbon Tetrachloride	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	106%	50%	140%	91%	60%	130%	108%	50%	140%
1,2-Dichloropropane 8153711 8153711 <0.03																140%
Trichloroethylene81537118153711<0.03<0.03NA<0.03121%50%140%110%60%130%129%50%1Bromodichloromethane81537118153711<0.05																140%
Bromodichloromethane 8153711 < 0.05 < 0.05 NA < 0.05 121% 50% 140% 94% 60% 130% 103% 50% 1 Methyl Isobutyl Ketone 8153711 8153711 < 0.05	, I I															140%
1,1,2-Trichloroethane 8153711 8153711 < 0.04	•															140%
1,1,2-Trichloroethane 8153711 8153711 < 0.04	Methyl Isobutyl Ketone	8153711 8	3153711	< 0.50	< 0.50	NA	< 0.50	97%	50%	140%	105%	50%	140%	103%	50%	140%
Toluene81537118153711<0.05<0.05NA<0.05115%50%140%108%60%130%100%50%1Dibromochloromethane81537118153711<0.05	1,1,2-Trichloroethane	8153711 8	3153711	< 0.04	< 0.04	NA	< 0.04	124%	50%	140%	121%	60%	130%	117%	50%	140%
Dibromochloromethane 8153711 8153711 < 0.05 < 0.05 NA < 0.05 90% 50% 140% 99% 60% 130% 79% 50% 1 Ethylene Dibromide 8153711 8153711 < 0.04	Toluene	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	115%	50%	140%		60%	130%	100%	50%	140%
Ethylene Dibromide81537118153711<0.04<0.04NA<0.04107%50%140%112%60%130%94%50%1Tetrachloroethylene81537118153711<0.05	Dibromochloromethane															140%
1,1,1,2-Tetrachloroethane 8153711 8153711 < 0.04	Ethylene Dibromide	8153711 8	3153711	< 0.04		NA		107%	50%	140%	112%	60%	130%	94%	50%	140%
1,1,1,2-Tetrachloroethane81537118153711< 0.04< 0.04NA< 0.0497%50%140%109%60%130%90%50%1Chlorobenzene81537118153711< 0.05	Tetrachloroethylene	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	119%	50%	140%	115%	60%	130%	102%	50%	140%
Chlorobenzene81537118153711< 0.05< 0.05NA< 0.0599%50%140%113%60%130%99%50%1Ethylbenzene81537118153711< 0.05	•															140%
Ethylbenzene m & p-Xylene8153711 8153711< 0.05< 0.05NA< 0.0589%50%140%105%60%130%93%50%1 m %Bromoform8153711 8153711< 0.05																140%
m & p-Xylene 8153711 8153711 < 0.05 < 0.05 NA < 0.05 85% 50% 140% 101% 60% 130% 88% 50% 1 Bromoform 8153711 8153711 < 0.05																140%
Styrene 8153711 8153711 < 0.05 < 0.05 NA < 0.05 84% 50% 140% 101% 60% 130% 86% 50% 1 1,1,2,2-Tetrachloroethane 8153711 8153711 < 0.05	•															140%
Styrene 8153711 8153711 < 0.05 < 0.05 NA < 0.05 84% 50% 140% 101% 60% 130% 86% 50% 1 1,1,2,2-Tetrachloroethane 8153711 8153711 < 0.05	Bromoform	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	109%	60%	130%	86%	50%	140%
1,1,2,2-Tetrachloroethane 8153711 8153711 < 0.05																
o-Xylene 8153711 8153711 < 0.05	•															
1,3-Dichlorobenzene 8153711 8153711 < 0.05																
1,2-Dichlorobenzene 8153711 8153711 < 0.05 < 0.05 NA < 0.05 82% 50% 140% 91% 60% 130% 79% 50% 1																
1,2-Dichlorobenzene 8153711 8153711 < 0.05 < 0.05 NA < 0.05 82% 50% 140% 91% 60% 130% 79% 50% 1	1,4-Dichlorobenzene	8153711 8	3153711	< 0.05	< 0.05	NA	< 0.05	90%	50%	140%	115%	60%	130%	95%	50%	140%
	1,3-Dichloropropene			< 0.04	< 0.03	NA	< 0.04	110%			96%			102%		140%
n-Hexane 8153711 8153711 < 0.05 < 0.05 NA < 0.05 124% 50% 140% 117% 60% 130% 109% 50% 1																

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

SAMPLING SITE:

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke

SAMPLED BY: Alyssa Troke

Trace Organics Analysis (Continued)

	•	1000	<u> </u>		/		(/					
RPT Date: Feb 06, 2017			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		otable nits	Recovery	Accept Limi		Recovery	Acceptabl Limits	
		ld					Value	Lower	Upper		Lower	Upper		Lower	Uppe
D. Reg. 153(511) - PHCs F1 - F4	. , ,	(Soil)													
2 (C10 to C16)	8156569		< 10	< 10	NA	< 10	98%	60%	130%	93%	80%	120%	73%	70%	130%
F3 (C16 to C34)	8156569		< 50	< 50	NA	< 50	103%	60%	130%	90%	80%	120%	82%	70%	130%
F4 (C34 to C50)	8156569		< 50	< 50	NA	< 50	96%	60%	130%	103%	80%	120%	80%	70%	130%
D. Reg. 153(511) - PAHs (Soil)															
laphthalene	8146264		< 0.05	< 0.05	NA	< 0.05	84%	50%	140%	79%	50%	140%	73%	50%	140%
Acenaphthylene	8146264		< 0.05	< 0.05	NA	< 0.05	100%	50%	140%	89%	50%	140%	77%	50%	140%
Acenaphthene	8146264		< 0.05	< 0.05	NA	< 0.05	97%	50%	140%	87%	50%	140%	76%	50%	140%
luorene	8146264		< 0.05	< 0.05	NA	< 0.05	96%	50%	140%	86%	50%	140%	75%	50%	140%
Phenanthrene	8146264		< 0.05	< 0.05	NA	< 0.05	99%	50%	140%	92%	50%	140%	80%	50%	140%
Inthracene	8146264		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	99%	50%	140%	88%	50%	140%
luoranthene	8146264		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	101%	50%	140%	87%	50%	140%
yrene	8146264		< 0.05	< 0.05	NA	< 0.05	108%	50%	140%	101%	50%	140%	86%	50%	140%
Senz(a)anthracene	8146264		< 0.05	< 0.05	NA	< 0.05	114%	50%	140%	106%	50%	140%	97%	50%	140%
Chrysene	8146264		< 0.05	< 0.05	NA	< 0.05	105%	50%	140%	95%	50%	140%	80%	50%	140%
Benzo(b)fluoranthene	8146264		< 0.05	< 0.05	NA	< 0.05	113%	50%	140%	104%	50%	140%	104%	50%	140%
Benzo(k)fluoranthene	8146264		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	92%	50%	140%	84%	50%	140%
Benzo(a)pyrene	8146264		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	98%	50%	140%	99%	50%	140%
ndeno(1,2,3-cd)pyrene	8146264		< 0.05	< 0.05	NA	< 0.05	101%	50%	140%	97%	50%	140%	79%	50%	140%
Dibenz(a,h)anthracene	8146264		< 0.05	< 0.05	NA	< 0.05	103%	50%	140%	100%	50%	140%	80%	50%	140%
Benzo(g,h,i)perylene	8146264		< 0.05	< 0.05	NA	< 0.05	94%	50%	140%	92%	50%	140%	73%	50%	140%
P-and 1-methyl Naphthalene	8146264		< 0.05	< 0.05	NA	< 0.05	107%	50%	140%	85%	50%	140%	74%	50%	140%
). Reg. 153(511) - PHCs F1 - F4	(with PAHs) ((Soil)													
Benzene	8157867		< 0.02	< 0.02	NA	< 0.02	105%	60%	130%	96%	60%	130%	119%	60%	130%
oluene	8157867		< 0.08	< 0.08	NA	< 0.08	98%	60%	130%	91%		130%	114%	60%	130%
thylbenzene	8157867		< 0.05	< 0.05	NA	< 0.05	95%		130%	91%		130%	110%	60%	1309
kylene Mixture	8157867		< 0.05	< 0.05	NA	< 0.05	97%	60%	130%	98%	60%	130%	114%	60%	130%
1 (C6 to C10)	8157867		< 5	< 5	NA	< 5	83%		130%	89%	85%	115%	85%		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 QUALITY ASSURANCE REPORT (V1)

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Page 11 of 15



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

SAMPLING SITE:

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke SAMPLED BY:Alyssa Troke

SAMELING SHE.		SAMIFLED BT.AIySsa Hoke								
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Soil Analysis	1	1								
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							
Mercury	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS							



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke SAMPLED BY:Alyssa Troke

FROJECT. 1030440 Riverside South	1 11. 2	ATTENTION TO: Alyssa Troke						
SAMPLING SITE:		SAMPLED BY:Alyssa Troke						
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					
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	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					
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	GRAVIMETRIC ANALYSIS					
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE					
Terphenyl	VOL-91-5009		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					



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Riverside South Ph. 2

AGAT WORK ORDER: 17Z182021 ATTENTION TO: Alyssa Troke

SAMPLING SITE:		SAMPLED BY: Alyssa Troke						
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE					
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					

hain of Custody I	G (A				e use Drinking Water Chain of				webe	Fax: 905.71 earth.agatla r human cons	abs.com				uantit) emper	-		T T U	88	14.0	18.0
Report Information: Company:	Associate	< C			Regulatory Requ (Please check all applicable boxes	uirements:		o Reg	ulato	ory Requ	iremei	nt		-	Seal I		t: 1 ((Yes		□No	
Contact: Address: Address: Address: 1931 Re Otheum (013-592 Reports to be sent to: 1. Email: Address: Addr	Troke/Kei bentson B	Regulation 153/04 Sewer Use Table Indicate One Ind/Com Sanitary Agriculture Storm Soil Texture (Check One) Region Coarse Indicate One Fine Indicate One					Regulation 558 CCME Prov. Water Quality Objectives (PWQO) Other Indicate One			Turnaround Time (TAT) Required: Regular TAT S 5 to 7 Business Days Rush TAT (Rush Surcharges Apply) 3 Business Days 1 Business Days 3 Business Days 2 Business Days 1 Business Days 0 Days 2 Business Days 1 Business Days 0 R Date Required (Rush Surcharges May Apply): 1 Business May Apply											
Project Information: Project: 165840 Site Location: Sampled By:	18- River	rside Se	with F	2h. 2	Is this submission Record of Site Co	ndition?			cate	uideline of Anal	vsis			-	Plea	ase p	rovide	prior n	otificati	ion for r	
AGAT Quote #:	uotation number is not pr			ranalysis es 🗶 No 🗆	Sample Matrix LegendBBiotaGWGround WaterOOilPPaintSSoilSDSedimentSWSurface Water	Field Filtered - Metals, Hg, CrVI (Please Circle)	Metals and Inorganics	Metal Scan (Rog. 153 At I marked) Hydride Forming Metals	Custom Metals	ORPs: DB+WS DCt DCN □ Cr ⁶⁺ □ EC □ FOC □ No ₂ /No ₂ □ Total N □ Hg □ pH □ SAR	NO2 DNO2/NO2	ctions 1	5		Chlorophenols		Organochlorine Pesticides	ICLP Metals/Inorganics Sewer Use		3 -	
Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Y/N	Metals	Metal S Hydrid	Client (ORPs: Cr ^e	Nutrients: Nutrients: Nolotitos:	CCME	ABNs	PAHs	Chloro	PCBs	Organo	Sewer Use			anis' i
BH17-89 5A2 BH17-33 5A2 FPI SAI FP2 SA2 BH17-8 SA1	5an.231		3	S										XXXXX							
																				DOI 10	

- 11 II

14

24

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

ATTENTION TO: Alyssa Troke

PROJECT: 1658448 - Claridge Ph II

AGAT WORK ORDER: 17Z182712

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

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: Feb 07, 2017

PAGES (INCLUDING COVER): 17

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 (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 17

Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



µg/L

Unit

%

1800

Acceptable Limits

50-140

Certificate of Analysis

AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

				O. Reg	. 153(511) - PAHs (Water)
DATE RECEIVED: 2017-01-31					DATE REPORTED: 2017-02-07
	S	SAMPLE DESC	CRIPTION:	MW #17-29	
		SAMF	LE TYPE:	Water	
		DATE S	AMPLED:	2017-01-30	
Parameter	Unit	G/S	RDL	8158895	
Naphthalene	µg/L	1400	0.20	<0.20	
Acenaphthylene	µg/L	1.8	0.20	<0.20	
Acenaphthene	µg/L	600	0.20	<0.20	
Fluorene	µg/L	400	0.20	<0.20	
Phenanthrene	µg/L	580	0.10	<0.10	
Anthracene	µg/L	2.4	0.10	<0.10	
Fluoranthene	µg/L	130	0.20	<0.20	
Pyrene	µg/L	68	0.20	<0.20	
Benz(a)anthracene	µg/L	4.7	0.20	<0.20	
Chrysene	µg/L	1	0.10	<0.10	
Benzo(b)fluoranthene	µg/L	0.75	0.10	<0.10	
Benzo(k)fluoranthene	µg/L	0.4	0.10	<0.10	
Benzo(a)pyrene	µg/L	0.81	0.01	<0.01	
Indeno(1,2,3-cd)pyrene	µg/L	0.2	0.20	<0.20	
Dibenz(a,h)anthracene	µg/L	0.52	0.20	<0.20	
Benzo(g,h,i)perylene	µg/L	0.2	0.20	<0.20	

Comments:

Chrysene-d12

2-and 1-methyl Naphthalene

Surrogate

RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water - All Types of Property Uses - Coarse Textured Soils

Note: The result for Benzo(b)Flouranthene is the total of the Benzo(b)&(j)Flouranthene isomers because the isomers co-elute on the GC column. 8158895

<0.20

54

0.20

Certified By:

trus

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO CANADA L4Z 1Y2

http://www.agatlabs.com

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECEIVED: 2017-01-31

DATE RECEIVED. 2017-01-31						DATE REPORTED. 2017-02-07
		SAMPLE DESC	RIPTION:	MW #17-30	MW #17-31	
		SAMP	LE TYPE:	Water	Water	
		DATE S	AMPLED:	2017-01-30	2017-01-30	
Parameter	Unit	G/S	RDL	8158931	8158942	
Benzene	µg/L	44	0.20	<0.20	<0.20	
Toluene	µg/L	18000	0.20	<0.20	<0.20	
Ethylbenzene	µg/L	2300	0.10	<0.10	<0.10	
Xylene Mixture	µg/L	4200	0.20	<0.20	<0.20	
⁼ 1 (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	480	
⁼ 4 (C34 to C50)	µg/L	500	100	<100	600	
Gravimetric Heavy Hydrocarbons	µg/L	500	500	NA	NA	
Surrogate	Unit	Acceptable	e Limits			
Terphenyl	%	60-14	10	72	75	

Certified By:

teus

DATE REPORTED: 2017-02-07

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



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECE	VED: 2017-01-31	DATE REPORTED: 2017-02-07
Comments:	RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to Table 3: Full Depth Types of Property Uses - Coarse Textured Soils	Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water - All
8158931	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 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.	nined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
8158942	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 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.	nined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.

teus

Certified By:

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



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

DATE REPORTED: 2017-02-07

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

ATTENTION TO: Alyssa Troke

SAMPLED BY:

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

DATE RECEIVED: 2017-01-31

		SAMPLE DESCRIP	TION: MW #17
		SAMPLE T	YPE: Wate
		DATE SAMF	PLED: 2017-01
Parameter	Unit	G/S R	DL 815889
F1 (C6 to C10)	µg/L	750 2	25 <25
F1 (C6 to C10) minus BTEX	µg/L	750 2	25 <25
F2 (C10 to C16)	µg/L	150 1	00 <100
F2 (C10 to C16) minus Naphthalene	µg/L	1	00 <100
F3 (C16 to C34)	µg/L	500 1	00 <100
F3 (C16 to C34) minus PAHs	µg/L	1	00 <100
F4 (C34 to C50)	µg/L	500 1	00 <100
Gravimetric Heavy Hydrocarbons	µg/L	500 5	00 NA
Surrogate	Unit	Acceptable Lin	nits
Terphenyl	%	60-140	69

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

8158895 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 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 WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

				O. Reg	. 153(511) - VOCs (Water)
DATE RECEIVED: 2017-01-31					DATE REPORTED: 2017-02-07
	:		RIPTION: LE TYPE: AMPLED:	MW #17-29 Water 2017-01-30	
Parameter	Unit	G / S	RDL	8158895	
Dichlorodifluoromethane	µg/L	4400	0.80	<0.80	
Vinyl Chloride	µg/L	0.5	0.50	<0.50	
Bromomethane	µg/L	5.6	0.80	<0.80	
Trichlorofluoromethane	µg/L	2500	1.60	<1.60	
Acetone	µg/L	130000	4.0	<4.0	
1,1-Dichloroethylene	µg/L	1.6	1.20	<1.20	
Methylene Chloride	µg/L	610	1.20	<1.20	
trans- 1,2-Dichloroethylene	µg/L	1.6	0.80	<0.80	
Methyl tert-butyl ether	µg/L	190	0.80	<0.80	
1,1-Dichloroethane	µg/L	320	1.20	<1.20	
Methyl Ethyl Ketone	µg/L	470000	4.0	<4.0	
cis- 1,2-Dichloroethylene	µg/L	1.6	0.80	<0.80	
Chloroform	µg/L	2.4	0.80	<0.80	
1,2-Dichloroethane	µg/L	1.6	0.80	<0.80	
1,1,1-Trichloroethane	µg/L	640	1.20	<1.20	
Carbon Tetrachloride	µg/L	0.79	0.79	<0.79	
Benzene	µg/L	44	0.80	<0.80	
1,2-Dichloropropane	µg/L	16	0.80	<0.80	
Trichloroethylene	µg/L	1.6	0.80	<0.80	
Bromodichloromethane	µg/L	85000	0.80	<0.80	
Methyl Isobutyl Ketone	µg/L	140000	4.0	<4.0	
1,1,2-Trichloroethane	µg/L	4.7	0.80	<0.80	
Toluene	µg/L	18000	0.80	<0.80	
Dibromochloromethane	µg/L	82000	0.40	<0.40	
Ethylene Dibromide	µg/L	0.25	0.25	<0.25	
Tetrachloroethylene	µg/L	1.6	0.80	<0.80	
1,1,1,2-Tetrachloroethane	µg/L	3.3	0.40	<0.40	
Chlorobenzene	µg/L	630	0.40	<0.40	
Ethylbenzene	µg/L	2300	0.40	<0.40	
m & p-Xylene	µg/L		0.80	<0.80	

Certified By:

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



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

DATE REPORTED: 2017-02-07

SAMPLED BY:

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

DATE RECEIVED: 2017-01-31

0/				
54	AMPLE DESC	RIPTION:	MW #17-29	
	SAMP	LE TYPE:	Water	
	DATE S	AMPLED:	2017-01-30	
Unit	G/S	RDL	8158895	
μg/L	380	0.40	<0.40	
μg/L	1300	0.40	<0.40	
µg/L	3.2	0.40	<0.40	
μg/L		0.40	<0.40	
μg/L	9600	0.40	<0.40	
μg/L	8	0.40	<0.40	
μg/L	4600	0.40	<0.40	
µg/L	5.2	1.20	<1.20	
μg/L	4200	0.80	<0.80	
μg/L	51	0.80	<0.80	
Unit	Acceptabl	e Limits		
% Recovery	50-14	40	107	
% Recovery	50-14	40	97	
	μg/L μg/L μg/L μg/L μg/L μg/L μg/L μg/L	DATE S Unit G / S μg/L 380 μg/L 1300 μg/L 3.2 μg/L 9600 μg/L 8 μg/L 8. μg/L 5.2 μg/L 5.1 Unit Acceptabl	μg/L 380 0.40 μg/L 1300 0.40 μg/L 3.2 0.40 μg/L 3.2 0.40 μg/L 0.40 0.40 μg/L 9600 0.40 μg/L 8 0.40 μg/L 5.2 1.20 μg/L 5.2 1.20 μg/L 5.1 0.80 μg/L 5.1 0.80 Unit Acceptable Limits % Recovery 50-140	DATE SAMPLED: 2017-01-30 Unit G / S RDL 8158895 µg/L 380 0.40 <0.40

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

8158895 Dilution factor=4

The sample was diluted because it was foamy. The reporting detection limit has been corrected for the dilution factor used.

teus

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

http://www.agatlabs.com

CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

				Inorga	nic Chemistry (Water)
DATE RECEIVED: 2017-01-3	31				DATE REPORTED: 2017-02-07
	5	SAMPLE DESC	CRIPTION:	MW #17-30	
		SAMF	LE TYPE:	Water	
		DATE S	AMPLED:	2017-01-30	
Parameter	Unit	G / S	RDL	8158931	
Iron	μg/L		10.0	78.9	
Sodium	µg/L	2300000	10000	1760000	
Chloride	μg/L	2300000	10000	4200000	
Sulphate	µg/L		10000	264000	
Resistivity	ohms.cm			81	
Comments: RDL - Reporte	ed Detection Limit;	G / S - Guidel	ine / Standar	d: Refers to Table 3	3: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition - Non-Potable Ground Water

Types of Property Uses - Coarse Textured Soils

8158931 Elevated RDLs indicate the degree of sample dilutions prior to analysis in order to keep the analytes within the calibration range of the instruments and to reduce matrix interferences.

Mile Mumenson

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



AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

SAMPLED BY:

				O. Reg.	153(511) - All Metals (Water)
DATE RECEIVED: 2017-01-31					DATE REPORTED: 2017-02-07
		SAMPLE DESC	CRIPTION:	MW #17-29	
		SAMF	PLE TYPE:	Water	
		DATE S	SAMPLED:	2017-01-30	
Parameter	Unit	G/S	RDL	8158895	
Antimony	µg/L	20000	1.0	<1.0	
Arsenic	µg/L	1900	1.0	1.2	
Barium	µg/L	29000	2.0	956	
Beryllium	µg/L	67	0.5	<0.5	
Boron	µg/L	45000	10.0	<10.0	
Cadmium	µg/L	2.7	0.2	<0.2	
Chromium	µg/L	810	2.0	5.1	
Cobalt	µg/L	66	0.5	24.1	
Copper	µg/L	87	1.0	9.0	
Lead	µg/L	25	0.5	<0.5	
Molybdenum	µg/L	9200	0.5	3.7	
Nickel	µg/L	490	1.0	21.6	
Selenium	µg/L	63	1.0	<1.0	
Silver	µg/L	1.5	0.2	<0.2	
Thallium	µg/L	510	0.3	<0.3	
Uranium	µg/L	420	0.5	9.0	
Vanadium	µg/L	250	0.4	0.7	
Zinc	µg/L	1100	5.0	17.6	
Mercury	µg/L	0.29	0.02	<0.02	
Chromium VI	µg/L	140	5	<5	

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 Comments: Types of Property Uses - Coarse Textured Soils

Certified By:

Mile Muneman

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

http://www.agatlabs.com

CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122



Guideline Violation

AGAT WORK ORDER: 17Z182712 PROJECT: 1658448 - Claridge Ph II 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

ATTENTION TO: Alyssa Troke

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8158931	MW #17-30	ON T3 NPGW CT	Inorganic Chemistry (Water)	Chloride	µg/L	2300000	4200000
8158942	MW #17-31	ON T3 NPGW CT	O. Reg. 153(511) - PHCs F1 - F4 (Water)	F4 (C34 to C50)	µg/L	500	600



MATRIX SPIKE

Recovery

Acceptable

Limits

Lower Upper

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

SAMPLING SITE:

RPT Date: Feb 07, 2017

PARAMETER

AGAT WORK ORDER: 17Z182712 ATTENTION TO: Alyssa Troke

SAMPLED BY:

Trace Organics Analysis REFERENCE MATERIAL DUPLICATE METHOD BLANK SPIKE Method Acceptable Acceptable Sample Blank Measured Limits Limits RPD Batch Dup #1 Dup #2 Recovery ld Value Lower Upper Lower Upper O. Reg. 153(511) - VOCs (Water)

Definitional biological Club biologica Club biological Clu	Dichlorodifluoromethane	8157927	< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	104%	50%	140%	85%	50%	140%
Bromomethane Trichiorofluoromethane 8157927 < 0.20 < 0.20 < 0.20 < 0.40 NA < 0.20 < 0.40 85% 50% 140% 10% 50% 140% 10% 50% 140% 10% 50% 140% 10% 50% 140% 10% 50% 140% 10% 50% 140% 10% 50% 140% 10% 10% 10% 50% 140% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10% 10%															
Trichlorofluoromethane 8157927 < 0.40 < 0.40 NA < 0.40 108% 50% 140% 93% 50% 140% Actoroe 8157927 < 0.30	•														
Acteone 8157927 <1.0 <1.0 NA <1.0 107% 50% 140% 97% 50% 140% 111% 50% 140% 1.1-Dichloroethylene 8157927 <0.30															
1.1-Dichloroethylene 8157927 0.30 0.30 NA < 0.30 109% 50% 140% 90% 60% 130% 50% 140% Methylene Chloride 8157927 < 0.20															
Methylene Chloride trans-1,2-Dichloroethylene Methyl ether 1,2-Dichloroethylene Methyl ether 1,1-Dichloroethylene 8157927 <0.30 <0.30 NA <0.30 104% 50% 140% 60% 130% 105% 50% 140% Methyl ether 1,1-Dichloroethane 8157927 <0.20	Acelone	010/92/	< 1.0	< 1.0	11/1	< 1.0	107 /6	5078	14076	91 /0	JU /0	140 /6	11170	5078	140 /0
trans-1.2-Dichloroethylene 8157927 < 0.20 < 0.20 NA < 0.20 105% 50% 140% 103% 60% 133% 101% 50% 140% Metryl tert-utyl ether 8157927 < 0.30	1,1-Dichloroethylene	8157927	< 0.30	< 0.30	NA	< 0.30	109%	50%	140%	90%	60%	130%	83%	50%	140%
Methyl terbulyt ethor 8157927 < 0.20 < 0.20 NA < 0.20 112% 50% 140% 130% 102% 50% 140% Methyl terbulyt ethor 8157927 < 1.0	Methylene Chloride	8157927	< 0.30	< 0.30	NA	< 0.30	104%	50%	140%	92%	60%	130%	105%	50%	140%
1,1-Dichloroethane 8157927 < 0.30 < 0.30 NA < 0.30 115% 50% 140% 105% 60% 130% 108% 50% 140% Methyl Ethyl Ketone 8157927 < 0.20	trans- 1,2-Dichloroethylene	8157927	< 0.20	< 0.20	NA	< 0.20	105%	50%	140%	109%	60%	130%	101%	50%	140%
Methyl Ethyl Ketone 8157927 <1.0 <1.0 NA <1.0 75% 50% 140% 88% 50% 140% cis-1.2-Dichloroethylene 8157927 <0.20	Methyl tert-butyl ether	8157927	< 0.20	< 0.20	NA	< 0.20	112%	50%	140%	97%	60%	130%	102%	50%	140%
cis-1,2-Dichloroethylene 8157927 <0.20	1,1-Dichloroethane	8157927	< 0.30	< 0.30	NA	< 0.30	115%	50%	140%	105%	60%	130%	108%	50%	140%
cis-1,2-Dichloroethylene 8157927 <0.20															
Chloroform 8157927 < 0.20 < 0.20 NA < 0.20 120% 50% 140% 83% 60% 130% 90% 50% 140% 1,2-Dichloroethane 8157927 < 0.30															
1,2-Dichloroethane 8157927 < 0.20															
1,1,1-Trichloroethane 8157927 < 0.30 < 0.30 NA < 0.30 111% 50% 140% 83% 60% 130% 81% 50% 140% Carbon Tetrachloride 8157927 < 0.20															
Carbon Tetrachloride B157927 < 0.20 < 0.20 NA < 0.20 112% 50% 140% 73% 50% 140% 1.2-Dichloropropane B157927 < 0.20															
Benzene8157927< 0.20< 0.20NA< 0.20113%50%140%73%60%130%77%50%140%1.2-Dichloropropane8157927< 0.20	1,1,1-Trichloroethane	8157927	< 0.30	< 0.30	NA	< 0.30	111%	50%	140%	83%	60%	130%	81%	50%	140%
Benzene 8157927 < 0.20 < 0.20 NA < 0.20 113% 50% 140% 73% 60% 130% 77% 50% 140% 1.2-Dichloropropane 8157927 < 0.20	Carbon Tetrachloride	8157927	< 0.20	< 0.20	NA	< 0.20	112%	50%	140%	90%	60%	130%	73%	50%	140%
1.2-Dichloropropane 8157927 < 0.20															
Trichloroethylene 8157927 < 0.20 < 0.20 NA < 0.20 102% 50% 140% 91% 60% 130% 91% 50% 140% Bromodichloromethane 8157927 < 0.20															
Bromodichloromethane 8157927 < 0.20 < 0.20 NA < 0.20 120% 50% 140% 82% 60% 130% 115% 50% 140% Methyl Isobutyl Ketone 8157927 < 0.0															
Methyl Isobutyl Ketone 8157927 < 1.0 < 1.0 NA < 1.0 81 50% 140% 72% 50% 140% 116% 50% 140% 116% 50% 140% 116% 50% 140% 71% 60% 130% 118% 50% 140% 10% 50% 140% 71% 60% 130% 118% 50% 140% 10% 50% 140% 74% 60% 130% 118% 50% 140% 10%	•														
1,1,2-Trichloroethane 8157927 < 0.20 < 0.20 < 0.20 NA < 0.20 93% 50% 140% 71% 60% 130% 118% 50% 140% Toluene 8157927 < 0.20															
Toluene8157927 Dibromochloromethane< 0.20 8157927< 0.20 < 0.10< 0.20 < 0.10NA < 0.10< 0.20 NA < 0.1093% s 50%50% 140%140% 74% 60%130% 60%103% 103%50% 50%140% 60%Dibromochloromethane8157927 112%< 0.10	Methyl Isobutyl Ketone	8157927	< 1.0	< 1.0	NA	< 1.0	81%	50%	140%	72%	50%	140%	116%	50%	140%
Dibromochloromethane 8157927 <0.10 <0.10 NA <0.10 93% 50% 140% 74% 60% 130% 103% 50% 140% Ethylene Dibromide 8157927 <0.10	1,1,2-Trichloroethane	8157927	< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	71%	60%	130%	118%	50%	140%
Ethylene Dibromide8157927< 0.10< 0.10NA< 0.1086%50%140%88%60%130%112%50%140%Tetrachloroethylene8157927< 0.20	Toluene	8157927	< 0.20	< 0.20	NA	< 0.20	99%	50%	140%	74%	60%	130%	85%	50%	140%
Tetrachloroethylene 8157927 <0.20 <0.20 NA <0.20 106% 50% 140% 79% 60% 130% 74% 50% 140% 1,1,1,2-Tetrachloroethane 8157927 <0.10	Dibromochloromethane	8157927	< 0.10	< 0.10	NA	< 0.10	93%	50%	140%	74%	60%	130%	103%	50%	140%
1,1,1,2-Tetrachloroethane8157927< 0.10< 0.10NA< 0.10105%50%140%71%60%130%104%50%140%Chlorobenzene8157927< 0.10< 0.10NA< 0.1098%50%140%71%60%130%95%50%140%Ethylbenzene8157927< 0.10< 0.10NA< 0.1097%50%140%72%60%130%95%50%140%Bromoform8157927< 0.20< 0.20NA< 0.20108%50%140%81%60%130%90%50%140%Bromoform8157927< 0.10< 0.10NA< 0.10114%50%140%81%60%130%90%50%140%Styrene8157927< 0.10< 0.10NA< 0.1091%50%140%81%60%130%94%50%140%1,1,2,2-Tetrachloroethane8157927< 0.10< 0.10NA< 0.1098%50%140%81%60%130%94%50%140%1,3-Dichlorobenzene8157927< 0.10< 0.10NA< 0.1098%50%140%83%60%130%94%50%140%1,4-Dichlorobenzene8157927< 0.10< 0.10NA< 0.10102%50%140%83%60%130%91%50%140%1,3-Dichlorobenzene8157927< 0.10< 0.10NA </td <td>Ethylene Dibromide</td> <td>8157927</td> <td>< 0.10</td> <td>< 0.10</td> <td>NA</td> <td>< 0.10</td> <td>86%</td> <td>50%</td> <td>140%</td> <td>88%</td> <td>60%</td> <td>130%</td> <td>112%</td> <td>50%</td> <td>140%</td>	Ethylene Dibromide	8157927	< 0.10	< 0.10	NA	< 0.10	86%	50%	140%	88%	60%	130%	112%	50%	140%
1,1,1,2-Tetrachloroethane8157927< 0.10< 0.10NA< 0.10105%50%140%71%60%130%104%50%140%Chlorobenzene8157927< 0.10	Tetrachloroethylene	8157927	< 0.20	< 0.20	ΝΔ	< 0.20	106%	50%	140%	79%	60%	130%	74%	50%	140%
Chlorobenzene8157927< 0.10< 0.10NA< 0.1098%50%140%74%60%130%95%50%140%Ethylbenzene8157927< 0.10	•														
Ethylbenzene 8157927 < 0.10 < 0.10 NA < 0.10 97% 50% 140% 72% 60% 130% 78% 50% 140% m & p-Xylene 8157927 < 0.20															
m & p-Xylene 8157927 < 0.20 < 0.20 NA < 0.20 108% 50% 140% 81% 60% 130% 90% 50% 140% Bromoform 8157927 < 0.10															
Bromoform 8157927 < 0.10 < 0.10 NA < 0.10 114% 50% 140% 82% 60% 130% 87% 50% 140% Styrene 8157927 < 0.10 < 0.10 NA < 0.10 91% 50% 140% 81% 60% 130% 87% 50% 140% 1,1,2,2-Tetrachloroethane 8157927 < 0.10 < 0.10 NA < 0.10 98% 50% 140% 84% 60% 130% 88% 50% 140% o-Xylene 8157927 < 0.10 < 0.10 NA < 0.10 112% 50% 140% 84% 60% 130% 88% 50% 140% 1,3-Dichlorobenzene 8157927 < 0.10 < 0.10 NA < 0.10 88% 50% 140% 83% 60% 130% 99% 50% 140% 1,4-Dichlorobenzene 8157927 < 0.10 < 0.10 NA < 0.10 102% 50% 140% 83% 60% 130% 112% 50% 140% 1,2-Dichlorobenzene															
Styrene 8157927 < 0.10 < 0.10 NA < 0.10 91% 50% 140% 81% 60% 130% 94% 50% 140% 1,1,2,2-Tetrachloroethane 8157927 < 0.10		0101021	¢ 0.20	< 0.20		0.20	10070	0070	11070	0170	0070	10070	0070	0070	11070
1,1,2,2-Tetrachloroethane 8157927 < 0.10 < 0.10 NA < 0.10 98% 50% 140% 84% 60% 130% 88% 50% 140% o-Xylene 8157927 < 0.10	Bromoform	8157927	< 0.10	< 0.10	NA	< 0.10	114%	50%	140%	82%	60%	130%	87%	50%	140%
o-Xylene 8157927 < 0.10 < 0.10 NA < 0.10 112% 50% 140% 84% 60% 130% 101% 50% 140% 1,3-Dichlorobenzene 8157927 < 0.10	Styrene	8157927	< 0.10	< 0.10	NA	< 0.10	91%	50%	140%	81%	60%	130%	94%	50%	140%
1,3-Dichlorobenzene8157927< 0.10< 0.10NA< 0.1088%50%140%89%60%130%99%50%140%1,4-Dichlorobenzene8157927< 0.10	1,1,2,2-Tetrachloroethane	8157927	< 0.10	< 0.10	NA	< 0.10	98%	50%	140%	84%	60%	130%	88%	50%	140%
1,4-Dichlorobenzene 8157927 < 0.10 < 0.10 NA < 0.10 102% 50% 140% 83% 60% 130% 112% 50% 140% 1,2-Dichlorobenzene 8157927 < 0.10	o-Xylene	8157927	< 0.10	< 0.10	NA	< 0.10	112%	50%	140%	84%	60%	130%	101%	50%	140%
1,2-Dichlorobenzene 8157927 < 0.10 < 0.10 NA < 0.10 93% 50% 140% 72% 60% 130% 111% 50% 140% 1,3-Dichloropropene 8157927 < 0.30	1,3-Dichlorobenzene	8157927	< 0.10	< 0.10	NA	< 0.10	88%	50%	140%	89%	60%	130%	99%	50%	140%
1,2-Dichlorobenzene 8157927 < 0.10 < 0.10 NA < 0.10 93% 50% 140% 72% 60% 130% 111% 50% 140% 1,3-Dichloropropene 8157927 < 0.30	1 A-Dichlorobenzene	8157027	< 0.10	< 0.10	ΝΛ	- 0.10	102%	50%	1/0%	83%	60%	120%	1120/	50%	1/10%
1,3-Dichloropropene 8157927 < 0.30 < 0.30 NA < 0.30 85% 50% 140% 89% 60% 130% 88% 50% 140%															
IFIEXALE 0107927 < 0.20 < 0.20 INA < 0.20 39% 00% 140% 100% 00% 100% 82% 00% 140%															
		010/92/	< 0.20	< 0.20	INA	< 0.20	33%	50%	140%	103%	00%	130%	0270	50%	140%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

SAMPLING SITE:

AGAT WORK ORDER: 17Z182712 ATTENTION TO: Alyssa Troke

SAMPLED BY:

Trace Organics Analysis (Continued)

	1000	<u> </u>		7 110		(00)		uou	/					
		C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK		MAT	RIX SPI	KE
Batch	Sample	Dup #1	Dup #2	RPD	Method Blank		Acceptable d Limits		Recovery			Recovery		ptable nits
	Ia					value	Lower	Upper		Lower Upper			Lower	Uppe
with PAHs)	(Water)													
8162197		< 25	< 25	NA	< 25	88%	60%	140%	90%	60%	140%	91%	60%	140%
	TW	< 100	< 100	NA	< 100	98%	60%	140%	69%	60%	140%	68%	60%	140%
	TW	< 100	< 100	NA	< 100	98%	60%	140%	87%	60%	140%	90%	60%	140%
	TW	< 100	< 100	NA	< 100	84%	60%	140%	83%	60%	140%	89%	60%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	98%	50%	140%	103%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	112%	50%	140%	91%	50%	140%	87%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	114%	50%	140%	91%	50%	140%	96%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	86%	50%	140%	91%	50%	140%	103%	50%	140%
	TW	< 0.10	< 0.10	NA	< 0.10	74%	50%	140%	91%	50%	140%	99%	50%	140%
	TW	< 0.10	< 0.10	NA	< 0.10	109%	50%	140%	97%	50%	140%	81%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	96%	50%	140%	96%	50%	140%	104%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	98%	50%	140%	94%	50%	140%	99%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	78%	50%	140%	107%	50%	140%	96%	50%	140%
	TW	< 0.10	< 0.10	NA	< 0.10	102%	50%	140%	101%	50%	140%	87%	50%	140%
	TW	< 0.10	< 0.10	NA	< 0.10	107%	50%	140%	100%	50%	140%	106%	50%	140%
	TW	< 0.10	< 0.10	NA	< 0.10	88%	50%	140%	104%	50%	140%	103%	50%	140%
	TW	< 0.01	< 0.01	NA	< 0.01	88%	50%	140%	104%	50%	140%	72%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	63%	50%	140%	84%	50%	140%	76%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	71%	50%	140%	82%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	93%	50%	140%	88%	50%	140%	90%	50%	140%
	TW	< 0.20	< 0.20	NA	< 0.20	114%	50%	140%	87%	50%	140%	93%	50%	140%
Water)														
8162197		< 0.20	< 0.20	NA	< 0.20	91%	50%	140%	84%	60%	130%	89%	50%	140%
														140%
														140%
														140%
	Batch (with PAHs) 8162197	Batch Sample Id With PAHs) (Water) 8162197 TW TW TW TW TW TW TW TW TW TW	Batch Sample Id Dup #1 Batch Sample Id Dup #1 with PAHs) (Water) 8162197 < 25 TW TW 100 TW TW < 100 TW TW < 0.0 TW TW < 0.20 TW TW < 0.10 TW TW < 0.20 TW S162197 < 0.20 S16219	TW C Batch Sample Id Dup #1 Dup #2 with PAHs) (Water) 3162197 < 25	UPLICATE Batch Sample Id Dup #1 Dup #2 RPD with PAHs) (Water) $< 25 < 25$ NA TW 100 100 NA TW 100 100 NA TW 100 100 NA TW 0.20 0.20 NA TW<	DUPLICATE Method Blank Batch Sample Id Dup #1 Dup #2 RPD Method Blank with PAHs) (Water) 8162197 < 25	DUPLICATE REFERENT Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measurec Value with PAHs) (Water) 8162197 < 25	DUPLICATE Method Batch Sample Id Dup #1 Dup #2 RPD Method Bank REFERENCE MA Measured Lin with PAHs) (Water) 25 < 25	DUPLICATE REFERENCE MATERIAL Batch Sample Id Dup #1 Dup #2 RPD Method Blank Method Measured Value Acceptable Limits 8162197 < 25	Batch Sample Id Dup #1 Dup #2 RPD Method Blank Measured Value Acceptable Limits Lower Recovery with PAHs) (Water) < 25	DUPLICATE REFERENCE MATERIAL METHOD BLANK Batch Sample Id Dup #1 Dup #2 RPD Method Blank Method Resured Acceptable Lumits Recovery Acce Lir with PAHs) (Water) 8162197 < 25	DUPLICATE Reference Mathematical Method Method Reference Mathematical Method Method	DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE MAT Batch Sample Dup #1 Dup #2 RPD Method Recovery Acceptable Limits Recovery Acceptable Acceptable </td <td>DUPLICATE Method Blank REFERENCE MATERIAL Value METHOD BLANK SPIKE MATRIX SPI Recovery Batch Sample Id Dup #1 Dup #2 RPD Method Blank REFERENCE MATERIAL Value METHOD BLANK SPIKE MATRIX SPI Lower With PAHs) (Water) 8162197 <25</td> <25	DUPLICATE Method Blank REFERENCE MATERIAL Value METHOD BLANK SPIKE MATRIX SPI Recovery Batch Sample Id Dup #1 Dup #2 RPD Method Blank REFERENCE MATERIAL Value METHOD BLANK SPIKE MATRIX SPI Lower With PAHs) (Water) 8162197 <25

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:

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AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

SAMPLING SITE:

AGAT WORK ORDER: 17Z182712

ATTENTION TO: Alyssa Troke

SAMPLED BY:

Water Analysis															
RPT Date: Feb 07, 2017			D	UPLICATI	1		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Accep Lim		Recovery		ptable nits	Recovery		ptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - All Metals (Wate	ər)														
Antimony	8158895 8	3158895	< 1.0	<1.0	NA	< 1.0	95%	70%	130%	101%	80%	120%	104%	70%	130%
Arsenic	8158895 8	3158895	1.2	1.4	NA	< 1.0	98%	70%	130%	97%	80%	120%	99%	70%	130%
Barium	8158895 8	3158895	956	929	2.9%	< 2.0	100%	70%	130%	101%	80%	120%	100%	70%	130%
Beryllium	8158895 8	3158895	< 0.5	<0.5	NA	< 0.5	94%	70%	130%	95%	80%	120%	97%	70%	130%
Boron	8158895 8	3158895	< 10.0	<10.0	NA	< 10.0	100%	70%	130%	98%	80%	120%	100%	70%	130%
Cadmium	8158895 8	3158895	< 0.2	<0.2	NA	< 0.2	100%	70%	130%	100%	80%	120%	99%	70%	130%
Chromium	8158895 8	3158895	5.1	4.7	NA	< 2.0	100%	70%	130%	105%	80%	120%	104%	70%	130%
Cobalt	8158895 8	3158895	24.1	25.6	6.0%	< 0.5	98%	70%	130%	92%	80%	120%	90%	70%	130%
Copper	8158895 8	3158895	9.0	10.1	11.5%	< 1.0	101%	70%	130%	103%	80%	120%	102%	70%	130%
Lead	8158895 8	3158895	< 0.5	<0.5	NA	< 0.5	100%	70%	130%	102%	80%	120%	99%	70%	130%
Molybdenum	8158895 8	3158895	3.7	3.8	2.7%	< 0.5	96%	70%	130%	95%	80%	120%	94%	70%	130%
Nickel	8158895 8	3158895	21.6	22.0	1.8%	< 1.0	91%	70%	130%	92%	80%	120%	90%	70%	130%
Selenium	8158895 8	3158895	< 1.0	< 1.0	NA	< 1.0	97%	70%	130%	98%	80%	120%	104%	70%	130%
Silver	8158895 8	3158895	< 0.2	<0.2	NA	< 0.2	101%	70%	130%	109%	80%	120%	108%	70%	130%
Thallium	8158895 8	3158895	< 0.3	<0.3	NA	< 0.3	103%	70%	130%	104%	80%	120%	102%	70%	130%
Uranium	8158895 8	3158895	9.0	8.5	5.7%	< 0.5	99%	70%	130%	102%	80%	120%	101%	70%	130%
Vanadium	8158895 8	3158895	0.7	<0.4	NA	< 0.4	101%	70%	130%	103%	80%	120%	102%	70%	130%
Zinc	8158895 8	3158895	17.6	18.8	NA	< 5.0	101%	70%	130%	100%	80%	120%	103%	70%	130%
Mercury	8164927		<0.02	<0.02	NA	< 0.02	102%	70%	130%	102%	80%	120%	94%	70%	130%
Chromium VI	8157927		<5	<5	NA	< 5	100%	70%	130%	98%	80%	120%	97%	70%	130%
Inorganic Chemistry (Water)															
Iron	8158895 8	3158895	<10.0	<10.0	NA	< 10.0	101%	90%	110%	98%	90%	110%	97%	70%	130%
Sodium	8161305		12400	12300	0.8%	< 500	98%	70%	130%	98%	80%	120%	101%	70%	130%
Chloride	8162091		278000	274000	1.4%	< 100	94%	70%	130%	102%	70%	130%	101%	70%	130%
Sulphate	8162091		143000	142000	0.7%	< 100	99%	90%	110%	101%	90%	110%	103%	80%	120%

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:

Male Muneman

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

AGAT WORK ORDER: 17Z182712 ATTENTION TO: Alyssa Troke

FROJECT. 1030440 - Clanuge Filli		SAMPLED BY							
SAMPLING SITE:		SAMPLED BY:							
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE						
Trace Organics Analysis			1						
Naphthalene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Acenaphthylene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Acenaphthene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Fluorene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Phenanthrene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Anthracene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Fluoranthene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Pyrene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benz(a)anthracene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Chrysene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benzo(b)fluoranthene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benzo(k)fluoranthene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benzo(a)pyrene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Indeno(1,2,3-cd)pyrene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Dibenz(a,h)anthracene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benzo(g,h,i)perylene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
2-and 1-methyl Naphthalene	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Chrysene-d12	ORG-91-5105	EPA SW-846 3510 & 8270	GC/MS						
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID						
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID						
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID						
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)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						
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						
F2 (C10 to C16)	VOL-91-5010	MOE PHC E3421	GC/FID						
F2 (C10 to C16) minus Naphthalene	VOL-91-5010	MOE PHC E3421	GC/FID						
F3 (C16 to C34)	VOL-91-5010	MOE PHC E3421	GC/FID						
F3 (C16 to C34) minus PAHs	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						
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						



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

AGAT WORK ORDER: 17Z182712 ATTENTION TO: Alyssa Troke

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
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



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 - Claridge Ph II

AGAT WORK ORDER: 17Z182712 ATTENTION TO: Alyssa Troke

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis	I		-
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Sulphate	INOR 1004	SM 4110 B	ION CHROMATOGRAPH
Resistivity		SM 2510 B	EC METER
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER

Chain of Custody Record If this is a D	rinking Water sample, please	Ories 129	5835 Coopers Avenue Mississauga. Ontario L4Z 1Y2 Ph: 905.712.5100 Fax: 905.712.5122 webearth.agatlabs.com	Laboratory Use Only Work Order #: 172182713 Cooler Quantity: Arrival Temperatures: 25 R-4 13.0
Report Information: GOLDER ASSOC. Contact: Alyssa Troke (Kerth) Address: 1931 Robertson R Phone: Ge13-592-9600 Fax: Reports to be sent to: Atroke @ golden.com 1. Email: Atroke @ golden.com 2. Email: Kholmes @ golden.com Project Information: Project: Site Location: 1658448 - Clandge PH.T		Regulatory Requirements: (Please check all applicable boxes) Regulation 153/04 Table Indicate One Indit On	er Use Regulation 558	Custody Seal Intact: Yes No No Notes: Yes No No Notes: Yes No No Turnaround Time (TAT) Required: Regular TAT S to 7 Business Days Rush TAT (Rush Surcharges Apply) 3 Business 2 Business Days Days Days Days 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
Sampled By: AGAT Quote #: Please note: If quotation number is not provided, client will be Invoice Information: Bill Company: Contact: Address: Email:	a billed full price for analysis.	Sample Matrix LegendBBiotaGWGround WaterOOilPPaintSSoilSDSedimentSWSurface Water	A Field Filtered - Metals: HLCM Metals and Inorganics Metals: HLCM Mill Metals: 1153 Metals: HLCM Mill Metals: 0.153 Metals: (excl. Hydrides) Mill Metals: 0.153 Metals: (excl. Hydrides) Mill Metals: 0.153 Metals: (excl. Hydrides) Mill Metals: 0.153 Metals: Mill Metals: 0.153 Metals: Mutrients: 0.17 Nutrients: 0.17	(0, ONG, Hio, ONG, A Control of C
Sample Identification Date Sampled S	Time # of Sam Sampled Containers Ma		× × Field Metals and it Metals and it Metals and it Imetals Mathematical Imetals	Unatiles: RVV Volatiles: RVV CCME Fraction ABNS ABNS PAHS PAHS PAHS PCBS: I Total Organochlorith TCLP: I M&I I TCLP: I M&I I TCLP: I M&I TCLP: I M/I TCLP: I M/I T
MW#17-30 30/01/17	1430 11 G. 1330 7 G. 1515 4 G.	N	₹ ✓	
Samples Stellinguished By (Priperfinme age Step)	Date Time	Samada Receiver, Burgerint Napie antidation		
Samples Relinautoring By (Print Name and Sign):	30/01/17 Tate 31-Teun-17-Time Date Time	Samples Received By (Print Norma and Sign):	Date Date	lan-17 ^{™me} 15652 /2/, ^{™me} Page of ^{™me} №: T 041608

A 12



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

ATTENTION TO: Alyssa Troke

PROJECT: 1658448

AGAT WORK ORDER: 17Z185120

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

DATE REPORTED: Feb 14, 2017

PAGES (INCLUDING COVER): 5

VERSION*: 1

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

<u>*NOTES</u>		

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

AGAT Laboratories (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

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Page 1 of 5

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 17Z185120 PROJECT: 1658448

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke

DATE REPORTED: 2017-02-14

SAMPLED BY:

O. Reg. 153(511) - ORPs (Soil) - EC & SAR

DATE RECEIVED: 2017-02-07

	S	AMPLE DES	CRIPTION:	BH17-8 SA7
		SAM	PLE TYPE:	Soil
		DATE	SAMPLED:	2017-01-23
Parameter	Unit	G/S	RDL	8174832
Electrical Conductivity	mS/cm	0.7	0.005	0.303
Sodium Adsorption Ratio	NA	5	NA	0.254

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 -Comments: Residential/Parkland/Institutional Property Use - Coarse Textured Soils

8174832 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

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

Page 2 of 5

Amanjot Bhela

Certified By:



MATRIX SPIKE

Recovery

Acceptable Limits

Lower Upper

Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448

RPT Date: Feb 14, 2017

SAMPLING SITE:

AGAT WORK ORDER: 17Z185120

ATTENTION TO: Alyssa Troke

SAMPLED BY:

				Soi	l Ana	alysis	6						
e: Feb 14, 2017			DUPLICATE				REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	Lim	ptable nits	
		iù					value	Lower	Upper		Lower	Upper	

O. Reg. 153(511) - ORPs (Soil) - EC & SAR												
Electrical Conductivity	8182368	1.10	1.11	0.9%	< 0.005	91%	90%	110%	NA			NA
Sodium Adsorption Ratio	8174708	8.15	8.03	1.5%	NA	NA			NA			NA

Comments: NA signifies Not Applicable.

Certified By:

Amanjot Bhela

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448

AGAT WORK ORDER: 17Z185120

ATTENTION TO: Alyssa Troke

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis	·	·	
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 6010C	ICP/OES

Chain of (Ories	f Custody Form		05.71	L2.51	sauga, 00 Fa webea	5 Coope , Ontaric ax: 905. arth.aga human o	0 L4Z 1 712.51 tlabs.co	Y2 22 0m	v	.abo Vork O Cooler Arrival	rder # Quan	tity:	7	-7	ne	IL) <u>;</u>	20) 3.5'
Report Inform Company: Contact: Address: Phone: Reports to be sent to: 1. Email: 2. Email: Project Inform Project:	Golder Alyssa T 1931 Pol 613-590- atroke @ Khoimes	ireke /ker pentaon TP 9600	Fax:	es teur		Regulatory Requ (Please check all applicable boxes) Regulation 153/04 Table	Sew Sa Sa Region Indi	er Use nitary	R	epoi	Reg CCN Prov Obje Othe	/. Water ectives (558 Quality PWQO) Dre e on	ent	TI R	egula ush T	roui ar TA AT (F 3 Bus Days OR D	nd T T tush Su siness Date F	rime archarge S Requir	es Appl	Yes 5 to 7 y) 2 Bus Days Rush S	tequi 7 Busin siness Surchar	ess Day	ys 1 Bu Day ay Apply	
Site Location: Sampled By: AGAT Quote #: Invoice Infor Company: Contact: Address: Email:		tation number is not prov			ranalysis es⊠ No □	Yes Sample Matrix Legend B Biota Gw Ground Water O Oil P Paint S Soil SD Sediment SW Surface Water	Field Fittered - Metals, Hg, CNI	and Inorganics		Hydride Forming Metals					CCME Fractions 1 to 4		*TAT i	s excl			eeken	tification de la construction de la constru			
Sample Id BHI7-8		Date Sampled Jan. 23/1	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	¥/!	Metals	Metal Scan	Hydride F	Client Cus	ORPs: □ □ Cr ⁶⁺ □ 1 □ Total N		Volatiles:	CCME Fra	PAHS	Chlorophenois	PCBs	Organoch	TCLP Met	Sewer Use	X Coor			
Samples Relinquished By (P Samples Relinquished By (P Samples Relinquished By (P	note / A int Name and Sign):	lyssa Tu CX	reste	Date Feb.7 Pale Feb Date	11:7 Time 10: 10: Time Time	30 Samples Received By (P Samples Received By (P Samples Received By (P	Print Name and Sign)	JU Fet	U U 80	λ (13				Date	b15		Time 2 Time Time	hi	00	Nº:	-	age	/ 31	f	L 3

Page 5 of 5



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

ATTENTION TO: Alyssa Troke; Keith Holmes

PROJECT: 1658448 Claridge TP

AGAT WORK ORDER: 17Z240912

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

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

DATE REPORTED: Aug 02, 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 (V1)

Member of: Association of Professional Engineers and Geoscientists of Alberta (APEGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA) AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

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Results relate only to the items tested and to all the items tested All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request



AGAT WORK ORDER: 17Z240912 PROJECT: 1658448 Claridge TP

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLED BY:

				O. Re	g. 153(511)	- ORPs (Soi	I)				
DATE RECEIVED: 2017-07-24								[DATE REPORTI	ED: 2017-08-02	
		SAMPLE DES	CRIPTION:	TP17-4 SA1	TP17-5 SA3	TP17-5 SA13	TP17-6 SA1	TP17-7 SA2	TP17-8 SA1	TP17-9 SA3	TP17-10 SA1
		SAM	PLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE	SAMPLED:	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G/S	RDL	8582433	8582437	8582441	8582449	8582452	8582456	8582464	8582504
Electrical Conductivity	mS/cm	0.7	0.005	0.146	0.861	0.809	0.251	1.49	0.311	0.043	0.143
Sodium Adsorption Ratio	NA	5	NA	0.174	2.91	2.86	0.289	27.2	2.35	0.203	0.816

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.

8582433-8582504 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil).

Amanjot Bhela

Certified By:

5835 COOPERS AVENUE

MISSISSAUGA, ONTARIO

http://www.agatlabs.com

CANADA L4Z 1Y2

TEL (905)712-5100 FAX (905)712-5122



AGAT WORK ORDER: 17Z240912 PROJECT: 1658448 Claridge TP 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

SAMPLING SITE:

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLED BY:

DATE RECEIVED: 2017-07-24								г	DATE REPORTE	D. 2017-08-02	
DATE RECEIVED: 2017-07-24								L		_D. 2017-00-02	
		SAMPLE DES	CRIPTION:	TP17-3 SA1	TP17-4 SA1	TP17-5 SA3	TP17-5 SA13	TP17-6 SA1	TP17-7 SA2	FB2 SA1	FB2 SA2
		SAM	PLE TYPE:	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE	SAMPLED:	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21	2017-07-21
Parameter	Unit	G/S	RDL	8582423	8582433	8582437	8582441	8582449	8582452	8582513	8582523
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
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	1100	2300	<50	<50	<50	<50	2800	750
F4 (C34 to C50)	µg/g	2800	50	1800	2800	<50	<50	<50	<50	3400	1100
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	8.5	7.0	22.7	21.9	25.2	21.7	6.8	5.7
Surrogate	Unit	Acceptab	le Limits								
Terphenyl	%	60-	140	92	87	89	96	105	91	95	84

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

Certified By:

teus



AGAT WORK ORDER: 17Z240912 PROJECT: 1658448 Claridge TP 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

SAMPLING SITE:

ATTENTION TO: Alyssa Troke; Keith Holmes

DATE REPORTED: 2017-08-02

SAMPLED BY:

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

DATE RECEIVED: 2017-07-24

		SAMPLE DESCR	RIPTION:	FB2 SA3	TP17-1 SA1	TP17-2 SA1	
		SAMPL	E TYPE:	Soil	Soil	Soil	
		DATE SA	MPLED:	2017-07-21	2017-07-21	2017-07-21	
Parameter	Unit	G / S	RDL	8582528	8582533	8588325	
Benzene	µg/g	0.21	0.02	<0.02	<0.02	<0.02	
Toluene	µg/g	2.3	0.08	<0.08	<0.08	<0.08	
Ethylbenzene	µg/g	2	0.05	<0.05	<0.05	<0.05	
Xylene Mixture	µg/g	3.1	0.05	<0.05	<0.05	<0.05	
F1 (C6 to C10)	µg/g	55	5	<5	<5	<5	
F1 (C6 to C10) minus BTEX	µg/g	55	5	<5	<5	<5	
F2 (C10 to C16)	µg/g	98	10	<10	<10	<10	
F3 (C16 to C34)	µg/g	300	50	790	560	630	
F4 (C34 to C50)	µg/g	2800	50	1200	1100	1000	
Gravimetric Heavy Hydrocarbons	µg/g	2800	50	NA	NA	NA	
Moisture Content	%		0.1	5.4	7.3	9.6	
Surrogate	Unit	Acceptable	Limits				
Terphenyl	%	60-14	0	94	86	81	

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.

8582423-8588325 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:



Guideline Violation

AGAT WORK ORDER: 17Z240912 PROJECT: 1658448 Claridge TP 5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.aqatlabs.com

CLIENT NAME: GOLDER ASSOCIATES LTD

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8582423	TP17-3 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	1100
8582433	TP17-4 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	2300
8582437	TP17-5 SA3	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Electrical Conductivity	mS/cm	0.7	0.861
8582441	TP17-5 SA13	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Electrical Conductivity	mS/cm	0.7	0.809
8582452	TP17-7 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Electrical Conductivity	mS/cm	0.7	1.49
8582452	TP17-7 SA2	ON T3 S RPI CT	O. Reg. 153(511) - ORPs (Soil)	Sodium Adsorption Ratio	NA	5	27.2
8582513	FB2 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	2800
8582513	FB2 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F4 (C34 to C50)	µg/g	2800	3400
8582523	FB2 SA2	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	750
8582528	FB2 SA3	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	790
8582533	TP17-1 SA1	ON T3 S RPI CT	O. Reg. 153(511) - PHCs F1 - F4 (Soil)	F3 (C16 to C34)	µg/g	300	560



Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Claridge TP

SAMPLING SITE:

AGAT WORK ORDER: 17Z240912

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLED BY:

				Soi	l Ana	alysis	5								
RPT Date: Aug 02, 2017			C	UPLICAT	E		REFEREN	NCE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured		ptable nits	Recoverv	Lie	ptable nits	Recoverv	Lin	eptable nits
		ld					Value	Lower	Upper		Lower	Upper		Lower	Uppe
O. Reg. 153(511) - ORPs (Soil) Electrical Conductivity Sodium Adsorption Ratio	8600321 8600321		0.192 2.30	0.203 2.41	5.6% 4.7%	< 0.005 NA	100% NA	90%	110%	NA NA			NA NA		

Comments: NA signifies Not Applicable.

Certified By:

Amanjot Bhela

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Claridge TP

SAMPLING SITE:

AGAT WORK ORDER: 17Z240912

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLED BY:

Trace Organics Analysis

				•	0										
RPT Date: Aug 02, 2017			C	UPLICATI	E		REFEREN	ICE MA	TERIAL	METHOD	BLANK	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value		ptable nits	Recovery	Lin	ptable nits	Recovery	Lie	ptable nits
		iù					value	Lower	Upper	-	Lower	Upper	-	Lower	Upper
O. Reg. 153(511) - PHCs F1 - F	=4 (Soil)														
Benzene	8588325 8	588325	< 0.02	< 0.02	NA	< 0.02	83%	60%	130%	103%	60%	130%	106%	60%	130%
Toluene	8588325 8	3588325	< 0.08	< 0.08	NA	< 0.08	88%	60%	130%	102%	60%	130%	108%	60%	130%
Ethylbenzene	8588325 8	3588325	< 0.05	< 0.05	NA	< 0.05	84%	60%	130%	99%	60%	130%	101%	60%	130%
Xylene Mixture	8588325 8	588325	< 0.05	< 0.05	NA	< 0.05	70%	60%	130%	73%	60%	130%	75%	60%	130%
F1 (C6 to C10)	8588325 8	3588325	< 5	< 5	NA	< 5	74%	60%	130%	87%	85%	115%	81%	70%	130%
F2 (C10 to C16)	8593002		< 10	< 10	NA	< 10	102%	60%	130%	84%	80%	120%	70%	70%	130%
F3 (C16 to C34)	8593002		< 50	< 50	NA	< 50	106%	60%	130%	91%	80%	120%	71%	70%	130%
F4 (C34 to C50)	8593002		< 50	< 50	NA	< 50	88%	60%	130%	81%	80%	120%	86%	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 QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD

PROJECT: 1658448 Claridge TP

AGAT WORK ORDER: 17Z240912

ATTENTION TO: Alyssa Troke; Keith Holmes

SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
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 6010C	ICP/OES
Trace Organics Analysis			
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

Chain of Custody Record If this is a Drinking Water sample, please	Cooler Quantity: Ore on celo
Report Information: Company: Golder Associateo	a use Drinking Water Chain of Custody Form (potable water intended for human consumption) Regulatory Requirements: No Regulatory Requirement Custody Seal Intact: Yes No Notes:
Address: 1931 Robertson Rd, ottawa	Regulation 153/04 Sewer Use Regulation 558 Table Sanitary CCME Ind/Com Stor 7 Business Days
Phone: 613-592-9600 Fax: Reports to be sent to: . 1. Email:	Image: Park Image: Storm Prov. Water Quality Prov. Water Quality Prov. Water Quality Soil Texture (check One) Image: Storm Image: Other Image: Storm Image: Storm Coarse Image: Storm Image: Storm Image: Storm Image: Storm Image: Storm Image: Storm
Project Information: Project: <u>1658448- Clanidge TP</u> Site Location: Sampled By:	Is this submission for a Report Guideline on Certificate of Analysis 5 Decemponent No Certificate of Analysis Yes No Yes No
AGAT Quote #: PO: PO: PO: PO: PO: Please note: If quotation number is not provided, client will be billed full price for analysis.	Sample Matrix Legend
Invoice Information: Bill To Same: Yes X No Company: Company: Contact: Address: Email:	All A
Sample Identification	Commental Metals and Full Metals N/A Nutrients: Image: Sewer Use CCME Frac CCME frac Sewer Use CCME frac Sewer Use
TP17-1 SAIA July 2//17 - 3 TP17-2 SAIA - - - TP17-3 SAI - -	5
TP17-4 SAI	
TP17-5 SA13 - TP17-6 SA1 - TP17-7 SA2 -	
TP17-8 SAI - TP17-9 SA3 - TP17-10 SAI -	No PHCs/BTEX
Samples Relinguished By Print Rama and Sign: ALUSSA Trocke (alussa Index Inde	
Samples Relinquished By (Print Name and Sign): Date Time.	Sumples Pacetived By (Print Shame and Ship) Pink Copy - Client 1 Yellow Copy - AGAT 1 White Copy - AGAT 1

Chain of C	Card Garden	rd If this is a		er sample, pla		Dries			5.712	2.5100 we	335 Coop ga, Ontar Fax: 905 pearth.ag for human	5 712. atlabs	5122 .com	2 1 -	Wo	ork Ord oler Qu	er #: iantit		77	20	ND e -	910	2 ice 3 i	s 7-0
Report Infor Company: Contact: Address: Phone: Reports to be sent to:	Alyssa Trake OHawa	n Associ	Holmes			Regulatory Requirement (Prease Check all applicable boxes) Regulation 153/04 Table	Sewer	Use ary			tory Re egulatior CME rov. Wate bjectives ther	558 r Qual	ity	nt	No Tui Rei	gular sh TA	DUN TAT T (Rus	d Ti	me	Apply)	T) Re	quiree	d: Days	
1. Email: 2. Email: Project Inform Project: Site Location: Sampled By:	atroke@g.ak Kholmer@ge nation: 1658448- C		17			Coarse ☐Fine Is this submission for a Record of Site Conditio Ø Yes □ No	Indicate	e One	Cert	port	Indicate Guidelin te of Ar	ne or	ls	a freed a		D; 0 *7/	Plea AT is e	te Re ase p exclu	equire provid	ed (Ru le pric	Days ush Suro or notifi ekends	charges cation fo and stat	May A May A	TAT
AGAT Quote #: Invoice Inform Company: Contact: Address: Email:	Please note: If quotation number		ill be billed full price Bill To Same:			Sample Matrix LegendBBiotaGWGround WaterOOilPPaintSSoilSDSedimentSWSurface Water		Field Filtered - Metals, Hg, CrVI	Metals and Inorganics	□ All Metals □ 153 Metals (excl. Hydrides) 0.0	122 DEC DFOC DHg C DFOC DHG	Full Metals Scan	Regulation/Custom Metals	Nutrients: DTP DNH ₃ DTKN DN0 ₃ DN0 ₃ DN0 ₃ +N0 ₂	S: UVOC DBTEX DTHM	CCME Fractions 1 to 4/BTEX			_	Urganochiorine Pesticides				
Samp	le Identification	Date Sampled	Time Sampled	# of Containers	Samp Matri		3	Y/N	Metals a	☐ All Metals ☐ 1 ☐ Hydride Metals		Full Met	Regulat		Volatiles:	CCME F	SVIDA	PARS 1	PCBS: LI Iotal	Urgano	Sewer Use			
FB2SAI FB2SA FB2SA		July 21/17	-	333	555											X								
Samples Relinquished By (P Samples Relinquished By (P Samples Relinquished By (P	int Name and Sign):	λ	Date Date Date	Time Time Time Time		Samples Received By Prot Name) and Sign):						Dat Dat Dat	.e •	y-1	۲۱۳ ۲۱۳ ۲۱۳	5		2	Nº:	Page	e 🙊	of	2

Pink Copy - Client I Yellow Copy - AGAT I White Copy - AGAT

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