PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

PROPOSED NEW DEVELOPMENT
17791 MOUNT HOPE ROAD
CALEDON, ONTARIO

Prepared for:

Palgrave Estate Homes

Prepared By:

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1.0 EXECUTIVE SUMMARY

Sirati & Partners Consultants Ltd. (SIRATI) was retained by Palgrave Estate Homes (the Client) to complete a Phase Two Environmental Site Assessment (ESA) at the property located at 17791 Mount Hope Road, in the Town of Caledon, Ontario (hereinafter referred to as the Phase Two Property or the Site). The approximate Site location is shown in Figure 1.

The Site is located on the east side of Mount Hope Road, in a rural residential and agricultural area of the Town of Caledon, Ontario. The Site has a municipal address of 17791 Mount Hope Road and is a parallelogram shape of land that covers an area of approximately 41.21 hectares (approximately 101.83 acres). The Site is generally flat and bounded by Mount Hope Road to the southwest, wooded undeveloped areas and residential properties to the northeast, northwest and southeast.

It is understood that the Client intends to re-develop the property into a residential subdivision with residential houses with one (1) level of basement. In support of the development application, a Phase One ESA was conducted at the Site, which identified areas of potential environmental concern present on Site and recommended an intrusive investigation in the form of Phase Two ESA.

The purpose of the Phase Two ESA was to assess the soil quality in the areas of potential environmental concerns identified in the Phase One ESA. The Phase Two ESA was conducted in general accordance with Ontario Regulation 153/04, as amended by O. Regs. 366/05, 66/08, 511/09, 245/10, 179/11, 269/11 and 333/13 (herein referred to as O. Reg. 153/04 as amended).

The Phase Two ESA program was conducted concurrently with a geotechnical investigation and included drilling of ten (10) boreholes with installation of five (5) monitoring wells, collecting soil samples from the locations in the APEC areas, conducting soil sample analyses, and assessing the chemical test results. The assessment of soil quality was carried out in terms of the applicable O. Reg. 153/04 (amended) Table 1 Standards for Full Depth Background Site Condition Standards for Residential/Parkland/Institutional Property Use in a coarse textured soil condition (MECP Table 1 Standards).

A summary of Phase Two ESA findings includes the following:

- The Site is located in a Kame Moraines area within the physiographic region of Oak Ridges Moraine. The overburden in the Site area consists of glaciofluvial ice-contact deposits: gravel and sand minor till, including esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits. Beneath the overburden, it lays the bedrock of Upper Ordovician facies: Georgian Bay Formation; Blue Mountain Formation which consists of shale, limestone, dolostone and siltstone.
- The Site is located in the Innisfil Creek Subwatershed in Nottawasaga River watershed. An ephemeral tributary/creek traverses the Site from northwest to southeast, which flows to Beeton

Creek, Bailey Creek, Innisfil Creek, and then Nottawasaga River that drains into Nottawasaga Bay (in Georgian Bay), about 50 km north of the Site.

- The soil stratigraphy at the Site consisted of a layer of topsoil, underlain by fill materials and/or reworked sand, and then by native soils. The fill materials generally consisted of silty sand to sandy silt, locally mixed with topsoil, and the layer of the fill materials and/or reworked sand extended to the depths ranging from 0.8 m below ground surface (mbgs) to 3.0 mbgs. The native soil predominantly consisted of sand, locally with gravelly sand, silty sand, silt, sandy silt or clayey silt. No bedrock was encountered at the maximum explorative depth of 9.7 mbgs.
- No representative groundwater levels were found in any of the monitoring wells at three (3) monitoring events. The actual groundwater levels would be below at least 6.1 mbgs. Based on the topographic features of the Site, the shallow groundwater flow could be inferred to be southeasterly.
- Based on visual and olfactory observations and headspace soil vapour measurements, no evidence of potential contamination was observed in any of the retrieved soil samples.
- Based on the chemical test results for soil samples, the measured concentrations of metals and inorganics (M&I) and organochlorine-pesticides (OCs) in soil samples met the applicable MECP Table 1 Standards.
- No impacts were found in the areas of potential environmental concern (APECs) associated with the potentially contaminating activities (PCAs) identified in the Phase One ESA.
- No assessment of groundwater and sediment was required in this Phase Two ESA.

Based on the findings of the Phase Two ESA, SIRATI is providing the following recommendations:

- As the tested soil samples taken from the Phase Two Property are in compliance with the applicable soil quality standards, no further investigation is warranted at this time.
- As no impact has been found in the areas identified with potential environmental concern, an RSC could be filed for the Site with the Ministry of Environment, Conservation and Parks (MECP) based on the results of the Phase One and Phase Two ESAs.
- When no longer required, all monitoring wells should be decommissioned in accordance with O. Reg. 903.

2.0 INTRODUCTION

Sirati & Partners Consultants Ltd. (SIRATI) was retained by Palgrave Estate Homes (the Client) to complete a Phase Two Environmental Site Assessment (ESA) at the property located at 17791 Mount Hope Road, in the Town of Caledon, Ontario (hereinafter referred to as the Phase Two Property or the Site). The approximate Site location is shown in Figure 1.

The Site is located on the east side of Mount Hope Road, in a rural residential and agricultural area of the Town of Caledon, Ontario. The Site has a municipal address of 17791 Mount Hope Road, Caledon, Ontario, and covers an area of approximately 41.21 hectares (approximately 101.83 acres).

It is understood that the Client intends to re-develop the property into a residential subdivision with residential houses with one (1) level of basement. In support of the development application, a Phase One ESA was conducted at the Site, which identified areas of potential environmental concern present on Site and recommended an intrusive investigation in the form of Phase Two ESA.

The purpose of the Phase Two ESA was to assess the soil quality in the areas of potential environmental concerns identified in the Phase One ESA. The Phase Two ESA was conducted in general accordance with Ontario Regulation 153/04, as amended by O. Regs. 366/05, 66/08, 511/09, 245/10, 179/11, 269/11 and 333/13 (herein referred to as O. Reg. 153/04 as amended).

2.1 Phase Two Property Information

The information for the Phase Two Property is provided in the following table.

Phase Two Property	**Information**	**Source**
Legal Description	Part Lot 28, Concession 8, Albion as in VS234449, Caledon	Service Ontario Land Registry Office #43 Legal Survey Plan – Appendix D
Property Identification Numbers (PINs)	14341-0040 (LT)	Service Ontario Land Registry Office #43
Municipal Address	17791 Mount Hope Road	Town of Caledon Interactive Maps
Zoning	A2-ORM (Rural- Oak Ridges Moraine)	Town of Caledon Zoning map

2.2 Contact Information

Contact information for the owner of the Phase Two Property is provided as follows:

Property Owner	**Source**
Pietro Crupi	Land Registry Office
Giuseppe Triumbari	

Property Owner	**Source**
Maria Teresa Triumbari	

2.3 Site Description

The Site is located on the east side of Mount Hope Road in a rural and residential area of Town of Caledon, Ontario. The Site has a municipal address of 17791 Mount Hope Road, and is a parallelogram shape of land that covers an area of approximately 41.21 hectares (approximately 101.83 acres). The Site is generally flat and bounded by Mount Hope Road to the southwest, wooded undeveloped areas and residential properties to the northeast, northwest and southeast.

2.4 Current and Proposed Future Uses

The Site is currently used for farming purposes (planting corn crops). It is understood that a subdivision development has been proposed at the Site for construction of residential houses with one level of basement.

2.5 Applicable Site Condition Standard

SIRATI has selected the applicable regulatory criteria from O.Reg.153/04, as amended under the Environmental Protection Act, to assess the analytical data from the submitted soil samples. The applicable soil and groundwater Standards for the Site were considered to be those contained in Table 1 Standards for Full Depth Background Site Condition for Residential/Parkland/Institutional uses, in accordance with the " Soil, Ground Water and Standards for use Under part XV.1 of the Environmental Protection Act" (EPA), April 15,2011 (hereinafter referred to as MECP Table 1 Standards).

The following information was used to select the appropriate criteria:

- The Site is located in a rural residential and agricultural area of the Town of Caledon, Ontario.
- Bedrock across the Site is located at a depth greater than 2 m.
- Although an ephemeral tributary was found to traverse the Site from northwest to southeast, the Site may not be considered to be located within 30 m of a surface water body.
- The Site is located within the wellhead protection area.
- The Site is located in Oak Ridges Moraine area.

- The soils at the Site were found to consist of predominantly sandy soils, which is categorized as coarse textured soil.

- The pH values measured in the soils taken at the Site were within the acceptable range of 5 to 9 for surface soils and 5 to 11 for subsurface soil.

Based on the above considered factors, the MECP Table 1 Standards were determined to be used for assessment.

3.0 BACKGROUND INFORMATION

3.1 Physical Setting

The Site is located in the Innisfil Creek Subwatershed in Nottawasaga River watershed. An ephemeral tributary/creek was found to traverse the Site from northwest to southeast, which flows to Beeton Creek, Bailey Creek, Innisfil Creek, and then Nottawasaga River that drains into Nottawasaga Bay (in Georgian Bay), about 50 km north of the Site.

The ground surface elevations at the Site range from approximately 310 metres above sea level (mASL) to 290 mASL. The shallow groundwater flow is influenced by the topography profile, and as such it is expected to be in a southeasterly direction. Groundwater flow direction could be confirmed only with the direct observation of the groundwater elevations at the Site.

According to the physiography map entitled "Physiography of Southern Ontario" OGS Map 2715, dated 1984, published by Ministry of Natural Resources, the Site is located in a Kame Moraines area within the physiographic region of Oak Ridges Moraine.

According to the quaternary map entitled "Quaternary Geology of Ontario-Southern Sheet" Map 2556, dated 1991, published by the Ministry of Northern Development and Mines, the overburden in the Site region consists of glaciofluvial ice-contact deposits: gravel and sand minor till, including esker, kame, end moraine, ice-marginal delta and subaqueous fan deposits.

According to the bedrock geology map entitled "Bedrock Geology of Ontario-Southern Sheet" Map 2544, dated 1991, published by the Ministry of Northern Development and Mines, the bedrock in the Site area consists of Upper Ordovician facies. Beneath the overburden it lays the bedrock of the Georgian Bay Formation; Blue Mountain Formation which consists of shale, limestone, dolostone and siltstone. It should be noted that the subsurface soil, rock and groundwater conditions described above represent generalized conditions only and should not be considered site specific.

3.2 Past Investigations

No previous environmental investigation was completed at the Site. However, it should be noted that a geotechnical investigation was concurrently conducted at the Site by SIRATI, and the results or findings of geotechnical investigation were summarized in a separate geotechnical report.

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The purpose of this investigation (Phase Two ESA) is to assess the soil and groundwater quality at the Property, as related to the environmental concerns raised in the findings of our Phase One ESA. This Phase Two ESA was conducted in general conformance with the O. Reg. 153/04, as amended.

The scope of work for this investigation included:

- Locating the underground and overhead utilities.
- Drilling a total of ten (10) boreholes to the maximum depth of approximately 9.7 mbgs for soil sampling.
- Completing installation of monitoring wells at five (5) advanced borehole locations for groundwater monitoring.
- Conducting groundwater monitoring and elevation survey.
- Screening and selecting soil samples for chemical analysis.
- Submitting selected soil samples (including QA/QC samples) for analysis of metals and inorganics (M&I) and organochlorine pesticides (OCs).
- Reviewing the analytical results and comparing with applicable MECP Standards.
- Preparing a Phase Two ESA report summarizing the result of Phase Two ESA investigation.

4.2 Media Investigated

Based on the findings of the Phase One ESA carried out by SIRATI, soil medium was recommended to be investigated during the Phase Two ESA in accordance with the Sampling and Analysis Plan as provided in Appendix A.

Sampling was conducted for soil from all the boreholes (BH1 to BH9 and BH10B). No surface water was present at the Site. Therefore, surface water or sediment sampling was not conducted.

4.3 Phase One Conceptual Site Model

A Phase One ESA was conducted by SIRATI at the Site in general accordance with O. Reg. 153/04 as amended, from which a Phase One Conceptual Site Model was established. As shown on Figures 2 and 3, two (2) potentially contaminating activities (PCAs) and two (2) areas of potential environmental concern (APECs) were found to be present on Site.

A summary of the identified APECs and PCAs, and the relevant contaminants of potential concern is presented in the following table.

APEC	Location of APEC	Potentially Contaminating Activity (PCA#)	Location of PCA	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, soil and/or sediment)
APEC-1	In the former building structure area at the Site	#30: Importation of Fill Material of Unknown Quality	On- Site (PCA-1)	Metals and inorganics	Soil
APEC-2	In the farming area at the Site	#40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	Off-Site (PCA-2)	Organochlorine pesticides, Metals	Soil

4.4 Deviations from Sampling and Analysis Plan

No deviations were made during the investigation for the Phase Two ESA, except that BH10 was labeled as BH10B for the second try at this investigated location. The change in borehole number labelling may not affect the scheduled sampling and analysis plan.

4.5 Impediments

No impediments were encountered during the investigation for the Phase Two ESA.

5.0 INVESTIGATION METHOD

5.1 General

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan provided in Appendix A and was directed and supervised by a Qualified Person (QP) defined in O. Reg. 153/04 as amended.

All methods used to complete this Phase Two ESA were in accordance with O. Reg. 153/04 as amended, SIRATI standard operating procedures and generally accepted industry practices.

The Phase Two ESA consisted of drilling ten (10) boreholes (BH1, BH2, BH3, BH4, BH5, BH6, BH7, BH8, BH9 and BH10B) on October 18 and 19, 2018. The boreholes were advanced to the maximum depth of approximately 9.7 mbgs. Five (5) groundwater monitoring wells were installed at the borehole locations of BH1, BH3, BH6, BH9 and BH10B for groundwater monitoring. The approximate borehole/monitoring well locations are shown on Figure 4.

The sampling and decontamination procedures were conducted in accordance with the "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", May 1996, revised December 1996, as amended by O. Reg. 511/09.

Laboratory analytical methods, protocols and procedures were carried out in accordance with the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", dated March 9, 2004, amended as of July 1, 2011, in accordance with O. Reg. 511/09 and O. Reg. 269/11.

5.2 Utility Clearance

Prior to the commencement of the investigation, various utility agencies were contacted to identify buried services on public land in the vicinity of the Site. In addition, a private locator was retained to survey the proposed borehole locations for buried services. No conflicts between the proposed borehole locations and underground utilities were encountered.

5.3 Health and Safety

Prior to commencing the investigation, a Health and Safety Plan (H&S) was developed and implemented by SIRATI. The H&S Plan identified and provided mitigative actions for potential physical and chemical hazards associated with the Phase Two ESA activities and information for procedures to follow in the event of an emergency.

5.4 Drilling and Excavating

The field work for this investigation was conducted on October 18 and 19, 2018. It consisted of drilling ten (10) boreholes (BH1 to BH9 and BH10B) to the maximum depth of approximately 9.7 mbgs. A total of five (5) groundwater monitoring wells were installed at the borehole locations at BH1, BH3, BH6, BH9 and BH10B for groundwater monitoring. The monitoring wells were installed at the bottom depths ranging from 6.1 to 7.6 mbgs.

The drilling information for the Phase Two ESA is provided in the Table below:

Date of Drilling	-October 18 and 19, 2018
Name of Contractor	-Davis Drilling Inc. 873 Nipissing Rd #3, Milton, ON L9T 4Z4
Equipment Used	- CME 55, Track Mounted (solid stem auger), - 2-inch split spoon soil sampling device
Decontamination Measures	- The split spoon sampling device was washed between each sample to minimize potential cross-contamination - The drilling contractor pre-cleaned a set of solid stem augers and tools prior to arriving on-site.
Sample Frequency	Refer to the Borehole Logs in Appendix B for recovered soil samples

The borehole drilling activity was observed by a SIRATI field technician who logged the borings and examined the samples as they were obtained. Details of the visual observation, including inferred stratigraphy, soil classification, standard penetration test N values (if any), and groundwater conditions were recorded.

All the soil samples obtained during the investigation were contained and transported to SIRATI's geotechnical laboratory for further inspection.

5.5 Soil Sampling

During soil sampling, appropriate precautions were taken and equipment and sampling tools were decontaminated during fieldwork to minimize potential cross-contamination between samples and boreholes.

Representative soil samples were recovered at regular depth intervals in the boreholes using conventional split spoon sampler. The soil samples taken from boreholes were labeled as SS. Observations of visible foreign materials and odours were recorded during the sampling operations. During each sampling event,

new disposable gloves were used to avoid the cross-contamination between the samples. Each soil sample was split into two parts. One part was placed into sealable plastic bags for subsequent soil vapour measurements (soil screening), and the other part was placed in laboratory-prepared glass jars, and/or vials. The sample jars and vials were kept and stored in coolers with ice.

Soil samples collected during this investigation were stored at low temperatures and brought to SIRATI's laboratory for detailed visual examination before selecting the analytical protocols. The samples were examined in detail by SIRATI staff and classified according to the visual and index properties. Details of the visual observation and testing are presented on the Borehole Logs included in Appendix B.

5.6 Field Screening Measurements (Soil)

Although there was no requirement based on the contaminants of concern flagged in the APECs, the soil samples were screened via headspace soil vapour measurements using RKI Instruments, Eagle Portable Multi-gas detector (with Methane Elimination Switch), S/N E2F426, operated in the methane elimination mode. The instrument measures combustible gases in the atmosphere. The monitor has a range of 0 ppm to 50,000 ppm and an accuracy of ± 5 %. The monitor was calibrated with hexane prior to field screening as per the calibration procedure outlined by RKI Instruments in "Instruction Manual Eagle Series Portable Multi-Gas Detector 71-0154RK" released March 11, 2016. The instrument was calibrated to hexane standards for both ppm and LEL prior to each use in accordance with the calibration procedures outlined in the instruction manual for the instrument. Our technician was trained by the supplier for the proper calibration procedure. The instrument is calibrated or tuned up by the supplier (Maxim Environmental and Safety Inc.) seasonally.

The representative worst-case soil samples based on the soil vapour measurements and visual and olfactory observations were selected from each borehole and submitted to the laboratory for chemical analyses.

5.7 Groundwater: Monitoring Well Installation

After borehole drilling, monitoring wells were installed at BH1, BH3, BH6, BH9 and BH10B using 3 m (10 feet) length and 50 mm (2 inch) diameter slotted PVC screen extended with riser pipes. A clean silica sand pack was placed around and up to approximately 0.6 m above the screen. A bentonite layer was then placed on the sand pack. The monitoring wells were capped with stick-up/monument protective casing.

After the monitoring well installation, the monitoring wells were supposed to be developed by purging the water from the wells using Waterra Pumps (Waterra tubing with foot valves) to remove the sediments and/or any well materials entering the monitoring wells. Since no water was found in the monitoring wells, well developments were not conducted.

5.8 Groundwater: Monitoring and Sampling

Groundwater level measurements were conducted in monitoring wells BH1, BH3, BH6, BH9 and BH10B on November 1, 2018, November 27, 2018 and April 10, 2019.

No groundwater sampling was conducted as part of this Phase Two ESA.

5.9 Sediment Sampling

Sediment sampling was not carried out as part of this investigation as there were no surface water bodies (ponds, creek, lake) found at the Site.

5.10 Analytical Testing

The soil samples were completed by SGS Environmental, located at 185 Concession Street, Lakefield, Ontario. SGS is accredited by the Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for all the parameters analysed during this investigation.

5.11 Residue Management Procedures

No apparent contamination was noted during the borehole drilling and soil sampling, the soil cuttings generated during drilling activity were disposed/spread off on the subject Site.

The analytical results of the analyzed soil samples confirmed absence of potential contamination in the soil cuttings.

5.12 Elevation Surveying

The elevations of the boreholes/monitoring wells were surveyed relative to geodetic datum by SIRATI staff using a GPS survey equipment. The survey data is presented on the attached Borehole Logs in Appendix B.

5.13 Quality Assurance (QA) and Quality Control (QC) Measures

Laboratory-supplied sample containers, containing the appropriate preservatives as required by the given analyses, were used for all sampling conducted at the Site. All sample containers were labelled accordingly to identify the sample location. Documentation related to sample location, and time of sampling was recorded for each sample. The samples were immediately placed in coolers packed with ice. The sampling and decontamination procedures were conducted in accordance with the "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", May 1996, revised December 1996.

Laboratory analytical methods, protocols and procedures were carried out in accordance with the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", dated March 9, 2004.

Soil samples for submission for analytical testing were collected from the undisturbed split spoon samples. There is no potential for cross-contamination associated with this sampling method. Until delivery to the analytical laboratory, custody of the samples was maintained by SIRATI. On completion of daily field activities, the samples were returned to SIRATI's office and stored in a refrigerator pending selection of samples for analytical testing. SIRATI transferred custody of the samples that had been selected for analysis to SGS Laboratories within an adequate time frame to ensure 'holding times' would be within the acceptable criteria. Chain of Custody forms identifying the samples and analyses were submitted to the laboratory to document the transfer of custody.

Quality control samples included field duplicates. The following quality control measures were implemented for this investigation.

- The collection of at least one field duplicate sample per site for every sampling media (where three or more such samples are collected).
- Where volatile organic chemical analysis is required, the collection of discrete samples directly into laboratory-prepared sample vials and immediate placement into a cooler with ice to maintain the temperature at less than 10 ºC for transport to the laboratory.
- Thorough cleaning of soil sampling equipment between sample sites.
- If trace organics in the collected samples are anticipated (organic chemicals with a concentration of less than 1 µg/g), precautions are made to avoid any possible cross- contamination (eliminating bare hand or latex glove contacts with the soil or water); soil sampling equipment used for the collection of trace organics are cleaned using a phosphate-free detergent and water, followed by a distilled water rinse and a methanol rinse between sampling sites.
- There were no deviations from the procedures set out in the quality assurance and quality control program set out in the sampling and analysis plan (Appendix A).

6.0 SUMMARY OF FINDINGS AND CONCLUSIONS

6.1 Soil Stratigraphy

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs included in Appendix B. Boundaries of soil indicated on the log sheets are intended to reflect transition zones for the purpose of environmental assessment and should not be interpreted as exact planes of geological change.

The soil stratigraphy at the Site, as shown on Figures 6 and 7, consisted of a layer of topsoil, underlain by fill materials and/or reworked sand, and then by native soils. The fill materials generally consisted of silty sand to sandy silt, locally mixed with topsoil, and the layer of the fill materials and/or reworked sand extended to the depths ranging from 0.8 mbgs to 3.0 mbgs. The native soil predominantly consisted of sand, locally with gravelly sand, silty sand, silt, sandy silt or clayey silt. No bedrock was encountered at the maximum explorative depth of 9.7 mbgs.

6.2 Groundwater Elevations and Flow Direction

Groundwater monitoring was conducted after installation of the monitoring wells on November 1, 2018, November 27, 2018 and April 10, 2019. The details of the monitoring well construction and the measured water levels are presented in the table below.

Well ID	Ground Elevation (mASL)	Screen Depth (mbgs)	Nov. 1, 2018 and Nov. 27, 2018	10-Apr-19
			Water Level (mbgs)	Water Level (mbgs)
BH1	298.92	4.0 ~ 7.6	dry	dry
BH3	297.75	3.0 ~ 6.1	dry	dry
BH6	299.93	3.0 ~ 6.1	dry	water at bottom
BH9	298.19	4.6 ~ 7.6	dry	water at bottom
BH10B	295.67	3.0 ~ 6.1	dry	dry

As presented, all the monitoring wells were dry at the monitoring events, except on April 10, 2019 when water was measured at the bottom of the monitoring wells at BH/MW6 and BH/MW9. However, it should be noted that the measured water levels at these two (2) monitoring wells may not be representative of the local groundwater table, which may be the condensed or infiltration water perched at the well bottom.

Based on the above, the groundwater level should be below at least 6.1 mbgs or below the elevation of approximately 293.8 mASL.

The groundwater flow direction could be not be confirmed based on the obtained groundwater level information. However, it could be inferred to be southeasterly based on the topographic features of the Site.

6.3 Groundwater Hydraulic Gradient

Due to lack of groundwater data, groundwater hydraulic gradient could not be interpreted.

6.4 Soil Texture

Based on visual observation, the soils at the Site were observed to consist mainly of sandy soils including silty sand, sand and gravelly sand, locally with silt, sandy silt or clayey silt.

As mentioned, geotechnical investigation was concurrently conducted with the Phase Two ESA. Seven (7) representative soil samples taken from five (5) boreholes were tested for grain size analysis. The results are presented in Borehole Logs on Appendix B. Four (4) soil samples taken from BH1, BH2, BH3 and BH10B at the depths ranging from approximately 2.2 mbgs to 7.6 mbgs were classified as sand, while the other three (3) soil samples taken from BH5 were classified as silt, sandy silt and clayey silt (the main layer of sandy soil at BH5 was not tested).

Based on the above, coarse soil texture was considered for the Site when selecting the applied soil quality standards.

6.5 Soil Field Screening

Head space vapour screening was conducted for all retrieved soil samples using a combustible gas detector (RKI Eagle) in methane elimination mode, calibrated with hexane and having a minimum detection level of ± 5 %.

Soil vapour measurements ranging from non-detect to 5 ppm were recorded for the soil samples, indicating insignificant combustible gases in the soil samples retrieved from the boreholes.

6.6 Soil Quality

6.6.1 Soil Samples

Soil sampling was conducted on October 18 and 19, 2018. Representative “worst case” soil samples taken from each borehole were selected based on the soil vapour measurements and visual, olfactory observations. Based on the field screening, a total of fifteen (15) soil samples, including two (2) duplicate samples, were selected and submitted for chemical analysis of metals and inorganics (M&I), and organochlorine pesticides (OCs).

A summary of the soil samples and selected analyses is presented below.

Sample ID	Sampling Date	Sample Depth (mbgs)	Parameter Analysed (O. Reg. 153/04 as amended)
BH1/SS1	October 19, 2018	0-0.6	M&I, OCs
BH2/SS1	October 19, 2018	0.8-1.4	OCs
BH3/SS3	October 18, 2018	1.5-2.1	OCs
BH3/SS4	October 18, 2018	2.4-2.9	M&I
BH4/SS2	October 18, 2018	0.8-1.4	M&I
BH5/SS3	October 18, 2018	1.5-2.1	M&I, OCs
BH6/SS1	October 18, 2018	0-0.6	M&I
BH6/SS2	October 18, 2018	0.8-1.4	OCs
BH7/SS1	October 19, 2018	0-0.6	OCs
BH7/SS2	October 19, 2018	0.8-1.4	M&I
BH8/SS2	October 18, 2018	0.8-1.4	OCs
BH9/SS3	October 19, 2018	1.5-2.1	M&I, OCs
BH10/SS2	October 19, 2018	0.8-1.4	M&I
Dup 1 (BH4/SS2)	October 18, 2018	0.8-1.4	M&I
Dup 2 (BH2/SS1)	October 19, 2018	0-0.6	OCs

Note: Inorganics include electrical conductivity (EC), pH and sodium adsorption ratio (SAR)

The analytical results are included in SGS analysis report in Appendix C and were compared with the MECP Table 1 Standards. The results are summarized and presented in Tables 1 and 2, and are discussed as follows.

Metals

Nine (9) soil samples including one duplicate sample were analyzed for metals package consisting of metals, arsenic, antimony, selenium, chromium (VI), mercury, cyanide, and boron (hot water soluble). As presented in Table 1, all the analyzed parameters in the soil samples met the MECP Table 1 Standards for Residential/Parkland/Institutional Property Uses.

Inorganics

Nine (9) soil samples including one duplicate sample were analyzed for inorganics (EC, SAR and pH). As presented in Table 1, the measured EC and SAR met the MECP Table 1 Standards for Residential/Parkland/Institutional Property Uses.

The pH values of the nine (9) tested soil samples, representative of surface and subsurface soil, were found to be within the acceptable range of 5 to 9, and 5 to 11, respectively.

OCs

Nine (9) soil samples including one duplicate sample were analyzed for OCs. As presented in Table 2, the measured OCs met the MECP Table 1 Standards for Residential/Parkland/Institutional Property Uses.

6.7 Groundwater Quality

No water or representative groundwater was found in all the monitoring wells in three (3) monitoring events. In addition, based on the findings of the Phase One ESA, there was no environmental issue related to the groundwater at the Site.

Therefore, groundwater quality was not assessed in this Phase Two ESA.

6.8 Sediment Quality

As there were no permanent surface water bodies (creeks, ponds or lakes) found at the Site, no requirement for assessment of sediment quality was identified. Therefore, sediment sampling and testing was not carried out as part of this investigation.

6.9 Quality Assurance and Quality Control Results

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan and in accordance with the SIRATI Standard Operating Procedures. The sampling and decontamination procedures were conducted in accordance with the "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", May 1996, revised December 1996, as amended by O. Reg. 511/09.

Laboratory analytical methods, protocols and procedures were carried out in accordance with the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", dated March 9, 2004, amended as of July 1, 2011, in accordance with O. Reg. 511/09 and O. Reg. 269/11 (herein referred to as Analytical Protocol).

6.9.1 Field Quality Assurance / Quality Control Samples

As part of the QA/QC program for the Phase Two ESA, QC samples in the form of field duplicate samples were analysed. Field duplicates were obtained by collecting one sample and immediately collecting the second sample. Field duplicates represent the precision of the whole method with respect to site heterogeneity, field sampling and laboratory analysis. Field duplicate samples were collected in the field for analysis of M&I and OCs in the soil. Details of QC samples including their analysis results are presented below.

Field Duplicates:

A total of two (2) field duplicate soil sample were collected and submitted for chemical analysis. Details of duplicate sampling and analysis are presented in the table below:

Duplicate Sample ID	Media	Original Sample ID	Test Conducted
Dup 1	Soil	BH4/SS2	M&I
Dup 2	Soil	BH2/SS1	OCs

The result of the analysis of the field duplicate samples is similar to the results for the original samples, and relative percent differences for the detectable tested parameters are within acceptable range. However, the relative percent differences could not be calculated between the original and duplicate samples in the situation where the original and/or duplicate samples were below the reported laboratory detection limits.

6.9.2 Sample Handling in Accordance with the Analytical Protocol

The samples analyzed as part of the Phase Two ESA were handled in accordance with the analytical protocol with respect to holding time, preservation method, storage requirement and sample container type.

6.9.3 Certification of Results

Based on the review of the QA/QC sample results for the soil samples of this investigation, the Chain of Custody forms and the laboratory Certificate of Analysis, it is certified that:

- All Certificates of Analysis or Analytical Reports received pursuant to Section 47(2) of O.Reg.153/04 as amended, comply with Section 47(3) of O. Reg. 153/04, as amended.
- A Certificate of Analysis or Analytical Report was received for each sample submitted for analysis. Copies of the Certificates of Analysis are included in Appendix C.

The samples analyzed as part of the Phase Two ESA were handled in accordance with the analytical protocol with respect to holding time, preservation method, storage requirement and sample container type.

6.9.4 Data Validation

The Analytical Protocol established Acceptance Limits for use when assessing the reliability of data reported by analytical laboratories including maximum holding times for the storage of samples/sample extracts between collection and analysis, analytical methods, field and/or laboratory quality assistance samples, recovery ranges for spiked samples and surrogates, Reporting Detection Limits (RDLs, mandatory maximum method detection limit) and precision required when analyzing laboratory replicate and spiked samples. The review of the data in the Certificate of Analysis indicates:

- All samples/sample extracts were analyzed within their applicable holding times using approved analytical methods.
- No tested parameters were detected in any laboratory blank samples.
- The Reported Detection Limits were met for the tested parameters.

The result of the laboratory duplicate sample is similar to the result for the original sample, and relative percent differences for the detectable tested parameters are within the acceptable range.

6.9.5 Data Quality Objectives

The overall quality of field data did not affect decision making and the overall objectives of the investigation were met.

6.10 Phase Two Conceptual Site Model (CSM)

A Phase Two CSM has been prepared based on the findings of the Phase One ESA and this Phase Two ESA and consists of the following figures and text descriptions.

- Figure 1– Site Location Plan
- Figure 2 – Potentially Contaminating Activities (PCAs)
- Figure 3 – Area of Potential Environmental Concerns (APECs)
- Figure 4 – Borehole & Monitoring Well Location Plan
- Figure 5 – Soil Profile Location Plan
- Figure 6 – Soil Profile A-A’
- Figure 7 – Soil Profile B-B’

6.10.1 Description and Assessment

The Site is located on the east side of Mount Hope Road, in a rural residential and agricultural area of the Town of Caledon, Ontario. The Site has a municipal address of 17791 Mount Hope Road and is a parallelogram shape of land that covers an area of approximately 41.21 hectares (approximately 101.83

acres). The Site is generally flat and bounded by Mount Hope Road to the southwest, wooded undeveloped areas and residential properties to the northeast, northwest and southeast.

The Site is currently used for agricultural purpose (for planting corn crops), and will be developed into a residential subdivision with houses with one-level basement.

The legal description of the Property and Property Identification Numbers (PINs) are summarized in the table below:

Municipal Address	**PIN**	**Property Description in Parcel Register**
17791 Mount Hope Road	14341-0040 (LT)	Part Lot 28, Concession 8, Albion as in VS234449, Caledon

6.10.1.1 Potentially Contaminating Activities (PCAs)

The Phase One ESA has identified the Potentially Contaminating Activities (PCAs) to be present at the Site, which may contribute to the potential environmental concerns at the Site.

The PCAs along with the corresponding list in Table 2 Schedule D of O. Reg.153/04 are summarized below:

On-Site PCAs:

- **PCA-1:** #30. Importation of Fill Material of Unknown Quality. Unknown quality of fill material that may have been used in the former building structure area.
- **PCA-2:** #40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications. Current and historical use of the property for agricultural purposes.

6.10.1.2 Areas of Potential Environmental Concern (APECs)

The Phase One ESA has identified two (2) areas of Potential Environmental Concern (APECs) at the Site, which are associated with the identified PCAs discussed above.

The identified APECs include:

- **APEC-1:** the former building structure area, where fill material may have been used.
- **APEC-2:** the farming area at the Site, where pesticides may be used for farming purpose.

6.10.1.3 Subsurface Structures and Utilities

It is understood that the former building structures were demolished between 2009 and 2013, and no building structures are currently present at the Site. The utilities may have been disconnected at the Site.

Prior to the commencement of the Phase Two investigation, a private locator was retained to survey the proposed borehole locations for buried services. No conflicts between the proposed borehole locations and underground utilities were encountered.

No information is available for any subsurface structures, which are associated with the former buildings. However, because no contamination has been found at the Site, the presence of any subsurface structures and utilities will not raise any environmental concerns, such as providing easy conduit for contaminant distribution or migration.

6.10.2 Site Conditions

6.10.2.1 Soil Stratigraphy

The soil stratigraphy at the Site, as shown on Figures 6 and 7, consisted of a layer of topsoil, underlain by fill materials and/or reworked sand, and then by native soils. The fill materials generally consisted of silty sand to sandy silt, locally mixed with topsoil, and the layer of the fill materials and/or reworked sand extended to the depths ranging from 0.8 mbgs to 3.0 mbgs. The native soil predominantly consisted of sand, locally with gravelly sand, silty sand, silt, sandy silt or clayey silt. No bedrock was encountered at the maximum explorative depth of 9.7 mbgs.

6.10.2.2 Hydrogeological Characterization

The shallow groundwater flow is influenced by the local topography profile, and as such it is expected to be in a south-easterly direction.

6.10.2.3 Approximate Depth to Bedrock

The bedrock was not encountered at the maximum depth of approximately 9.7 mbgs during the Phase Two investigation.

6.10.2.4 Approximate Depth to Water Table

Based on the groundwater level measurements, the groundwater level should be below at least 6.1 mbgs or below the elevation of approximately 293.8 mASL.

6.10.2.5 Section 41 or 43.1 of the Regulation

The Site is located within Oak Ridges Moraine Conservation plan area. Therefore, the Site could be considered as an area of natural significance. As a result, Section 41 of the regulation (Site Condition Standards, Environmental Sensitive Areas) shall apply to the Site.

As bedrock was not encountered in any of the boreholes within 2.0 mbgs, the Site should not be considered as a shallow soil property. Moreover, no open water bodies are located on the Site or within 30 m from the Site. Therefore, Section 43.1 shall not apply to the Site.

6.10.2.6 Soils Placed On, In or Under the Phase Two Property

Based on Phase One and Two ESAs completed at the Site, no indication of significant fill materials or soils were placed at the Site.

Although fill materials were encountered at all the advanced boreholes, no foreign materials were observed. In addition, the analytical results for the soil samples taken from the fill materials met the applicable MECP Table 1 Standards.

6.10.2.7 Proposed Building and Other Structures

The Site will be developed into a residential subdivision with houses with one level of basement.

6.10.3 Contamination In or Under the Phase Two Property

Based on the Phase One ESA, two (2) APEC areas were identified at the Site where the soils may be impacted due to the associated contaminants of concern.

The soil sampling and testing carried out in the Phase Two ESA indicated that the concentrations for the contaminants of concern including metals, inorganics and organochlorine pesticides are at concentrations below the applicable MECP Table 1 Standards.

Therefore, there is no contamination found in or under the Phase Two Property.

6.10.3.1 Area Where Contaminants are Present

Based on the Phase One ESA, two (2) APEC areas were identified at the Site, which may be impacted due to contaminants of concern. However, based on the Phase Two investigation, the concentrations for the contaminants of concern including metals, inorganics and organochlorine pesticides are at concentrations below the applicable MECP Table 1 Standards. Therefore, there are no areas which have contaminants.

6.10.3.2 Distribution of Contaminants

No contaminants are identified at the Site at a concentration above applicable site condition standards. So, there is no distribution of contaminants to consider.

6.10.3.3 Contaminants Medium

Based on the Phase One ESA, soil in two (2) APEC areas may be impacted. However, based on the Phase Two investigation, no contaminants in soil are identified at a concentration above applicable site condition standards.

6.10.3.4 Reason for Discharge

No contaminants are identified at the Site at a concentration above applicable site condition standards. As a result, discharge of contaminants is not considered or relevant.

6.10.3.5 Migration of Contaminants

No contaminants were identified at the Site at a concentration above applicable site condition standards. As a result, migration of contaminants is not expected.

6.10.3.6 Climatic or Meteorological Conditions Influencing Contaminant Distribution or Migration

No contaminants were identified at the Site at a concentration above applicable site condition standards. As a result, there is no contaminant distribution or migration at the Site. Therefore, the climatic or meteorological conditions that may cause temporal fluctuations in groundwater levels will not be considered to influence or to have influenced distribution or migration of the contaminants at the Site.

6.10.3.7 Soil Vapour Intrusion into Buildings

The Phase Two Property currently has no building structures. Given that no contamination was found at the Site, soil vapour intrusion would not be anticipated.

6.10.4 Potential Exposure Pathways and Receptors

As no contaminants are found at the Site at a concentration above the applicable site condition standard (MECP Table 1 Standards), no potential exposure pathways and receptors are relevant or considered.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the site background information, field investigation data and laboratory test results compiled to date and presented above, the following conclusions are made on the site setting, soil stratigraphy and groundwater conditions and existing environmental conditions in comparison with the Ontario Regulation 153/04 (as amended), MECP Table 1 Standards.

- The Site is located in a Kame Moraines area within the physiographic region of Oak Ridges Moraine. The overburden in the Site area consists of glaciofluvial ice-contact deposits: gravel and sand minor till, including esker, kame, end moraine, ice-marginal delta and subaqueous deposits. Beneath the overburden, it lays the bedrock of Upper Ordovician facies: Georgian Bay Formation, Blue Mountain Formation which consists of shale, limestone, dolostone and siltstone.
- The Site is located in the Innisfil Creek Subwatershed in Nottawasaga River watershed. An ephemeral tributary/creek traverses the Site from northwest to southeast, which flows to Beeton Creek, Bailey Creek, Innisfil Creek, and then Nottawasaga River that drains into Nottawasaga Bay (in Georgian Bay), about 50 km north of the Site.
- The soil stratigraphy at the Site consisted of a layer of topsoil, underlain by fill materials and/or reworked sand, and then by native soils. The fill materials generally consisted of silty sand to sandy silt, locally mixed with topsoil, and the layer of the fill materials and/or reworked sand extended to the depths ranging from 0.8 mbgs to 3.0 mbgs. The native soil predominantly consisted of sand, locally with gravelly sand, silty sand, silt, sandy silt or clayey silt. No bedrock was encountered at the maximum explorative depth of 9.7 mbgs.
- No representative groundwater levels were found in any of the monitoring wells in three (3) monitoring events. The actual groundwater levels would be below at least 6.1 mbgs. Based on the topographic features of the Site, the shallow groundwater flow could be inferred to be southeasterly.
- Based on visual and olfactory observations and headspace soil vapour measurements, no evidence of potential contamination was observed in any of the retrieved soil samples.
- Based on the chemical test results for soil samples, the measured concentrations of metals and inorganics (M&I) and organochlorine-pesticides (OCs) in soil samples met the applicable MECP Table 1 Standards.
- No impacts were found in the areas of potential environmental concern (APECs) associated with the potentially contaminating activities (PCAs) identified in the Phase One ESA.

No assessment of groundwater and sediment was required in this Phase Two ESA.

Based on the findings of the Phase Two ESA, SIRATI provides the following conclusions:

- As the tested soil samples taken from the Phase Two Property are in compliance with the applicable soil quality standards, no further investigation is warranted at this time.
- As no impact has been found in the areas of potential environmental concern, an RSC could be filed for the Site with the Ministry of Environment, Conservation and Parks (MECP) based on the results of the Phase One and Phase Two ESAs.
- When no longer required, all monitoring wells should be decommissioned in accordance with O. Reg. 903.

7.1 Signatures

The Phase Two ESA has been completed under the direction and supervision of Dr. Giorgio Garofalo, P.Geo., QP_{ESA}. The findings and conclusions presented in this report have been determined based on the information that was obtained and reviewed, and on an assessment of the existing conditions at the Phase Two Property.

We trust this report meets your requirements. Should you have any questions regarding the information presented, please do not hesitate to contact our office.

Yours truly,

Sirati and Partners Consultants Ltd.

PROFESSIONAL GEOSCIENTIST
JAN 30, 2020
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8.0 LIMITATIONS AND USE OF THE REPORT

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This report was prepared based on a Phase Two ESA investigation undertaken at the property located at 17791 Mount Hope Road, Caledon, Ontario and is exclusively intended to provide an Environmental Site Assessment and conditions at the above noted property.

This report was prepared by Sirati & Partners Consultants Ltd. (SIRATI) for the sole purpose of identifying potential environmental constraints pertinent to the subject Property, including likelihood of environmental impacts on the soil and groundwater as a result of current and past uses of the Property. This report shall not be relied upon or transferred to any other party without the express written authorisation of SIRATI. It may contain material subject to copyright or obtained subject to license; unauthorised copying of this report will be in breach of copyright/license.

The findings and opinions provided in this document are given in good faith and are subject to the limitations imposed by employing assessment methods and techniques, appropriate to the time of derivation and within the limitations and constraints defined within this document. The findings and opinions are relevant to the dates when the report was written but should not necessarily be relied upon to be appropriate at a substantially later date. In particular, changes to model algorithms and input parameters as a result of more recent publication by the authorities such as MECP, may affect the conceptual understanding upon which the Assessment Criteria (AC) were derived. The assessment should therefore not be considered as a comprehensive audit that would eliminate all environmental risks associated with the subject Property. The conclusions arrived at and assessment of subsurface conditions were based on information collected at the time of conducting the fieldwork at specific borehole/test-pit/ sampling points and/or monitoring well locations. The actual subsurface conditions may vary.

Factual information has largely been obtained from authoritative sources; however, where authoritative information is unavailable or is in draft format, modification to the input data maybe required as and when authoritative information is published. Where such information might impact upon stated opinions, SIRATI reserves the right to modify such opinions expressed herein.

The findings and opinions conveyed, via this report, are based on information obtained from a variety of sources as detailed in this report, and which SIRATI assumes to be reliable, but have not been independently confirmed. Therefore, SIRATI cannot and does not guarantee the authenticity or reliability of third-party information it has relied upon.

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This information given herein should be read in conjunction with the contract documents. Any contradiction in sampling regime should be addressed by the project leader or contract manager.

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9.0 REFERENCES

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- MOE. "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", dated March 9, 2004, amended as of July 1, 2011, in accordance with O. Reg. 511/09 and O. Reg. 269/11.
- Phase One Environmental Site Assessment Proposed New Development 17791 Mount Hope Road, Caledon, Ontario, June 25, 2019, SIRATI

TABLES

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Table 1
Soil Quality- Metals & Inorganics (M&I)
Phase Two Environmental Site Assessment
17791 Mount Hope Road, Caledon, ON

Sample ID	Unit	RDL	Ontario Regulation 153/04 Table 1 Standards	BH1-SS1	BH3-SS4	BH4-SS2	BH5-SS3	BH6-SS1	BH7-SS2	BH9-SS3	BH10-SS2	DUP 1 (BH4-SS2)
Date Sampled				19-Oct-18	18-Oct-18	18-Oct-18	18-Oct-18	18-Oct-18	19-Oct-18	19-Oct-18	19-Oct-18	18-Oct-18
Screen (mbgs)			Full depth	(0-0.6)	(2.4-2.9)	(0.8-1.4)	(1.5-2.1)	(0-0.6)	(0.8-1.4)	(1.5-2.1)	(0.8-1.4)	(0.8-1.4)
Laboratory ID			Residential/Parkland/Institutional	CA14589-OCT188	CA14589-OCT1812	CA14589-OCT1813	CA14589-OCT1814	CA14589-OCT1817	CA14589-OCT1817	CA14589-OCT1820	CA14589-OCT1821	CA14589-OCT1821
Antimony	µg/g	0.8	1.3	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	µg/g	0.5	18	1.7	1.1	0.9	2.2	0.8	1.2	2.7	0.6	0.9
Barium	µg/g	0.01	220	15	8.7	6.9	41	21	8.9	38	26	6.4
Beryllium	µg/g	0.02	2.5	0.15	0.11	0.08	0.26	0.15	0.11	0.32	0.2	0.08
Boron (total)	µg/g	1	36	2	2	2	4	1	2	4	< 1	2
Boron (Hot Water Soluble)	µg/g	0.5	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Cadmium	µg/g	0.02	1.2	0.06	0.02	< 0.02	0.05	0.06	0.03	0.06	0.03	0.04
Chromium Total	µg/g	0.5	70	6.6	5	3.7	12	6.5	4.9	15	6.3	3.7
Chromium VI	µg/g	0.2	0.66	0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2	< 0.2	0.3	< 0.2
Cobalt	µg/g	0.01	21	2.4	1.9	1.4	5.7	2.1	2.2	6.6	2	1.4
Copper	µg/g	0.1	92	6.3	4.4	3.4	11	3.6	6	14	2.3	3
Cyanide (CN-)	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Electrical Conductivity (mS/cm)	mS/cm	0.002	0.57	0.16	0.09	0.08	0.15	0.19	0.1	0.15	0.15	0.08
Lead	µg/g	0.1	120	3.1	2	1.8	4.3	3.5	2.2	5.3	2.8	1.8
Mercury	µg/g	0.05	0.27	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Molybdenum	µg/g	0.1	2	0.1	0.1	< 0.1	0.1	0.1	0.1	0.2	< 0.1	< 0.1
Nickel	µg/g	0.5	82	4.5	3.6	2.7	12	3.9	4.3	14	3.5	2.7
Selenium	µg/g	0.7	1.5	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7
Silver	µg/g	0.05	0.5	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium Adsorption Ratio	---	0.2	2.4	< 0.2	< 0.2	< 0.2	0.2	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Thallium	µg/g	0.02	1	0.04	0.03	< 0.02	0.09	0.03	0.04	0.11	0.03	0.02
Uranium	µg/g	0.002	2.5	0.39	0.29	0.3	0.38	0.3	0.32	0.42	0.21	0.26
Vanadium	µg/g	3	86	15	12	9	20	14	11	23	12	9
Zinc	µg/g	0.7	290	15	9.7	7.7	25	17	12	31	10	7.9
pH	pH Units	0.05	NV	7.89	8.03	8.18	8	7.44	8.1	7.84	7.64	8.14

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Note: Bold. Italic & Underline exceedance of MECP Table 1: Full Depth Background Site Condition Standards for Residential/Parkland/Institutional property use in coarse soil condition.

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Table 2
Soil Quality- OCs
Phase Two Environmental Site Assessment
17791 Mount Hope Road, Caledon, ON

Sample ID	Unit	RDL	Ontario Regulation 153/04 Table 1 Standards	BH1-SS1	BH2-SS1	BH3-SS3	BH5-SS3	BH6-SS2	BH7-SS1	BH8-SS2	BH9-SS3	Dup 2 (BH2-SS1)
Date Sampled				Oct 19,2018	Oct 19,2018	18-Oct-18	18-Oct-18	18-Oct-18	Oct 19,2018	18-Oct-18	Oct 19,2018	Oct 19,2018
Screen (mbgs)			Full depth Residential/Parkland/Institutional	(0-0.6)	(0.8-1.4)	(1.5-2.1)	(1.5-2.1)	(0.8-1.4)	(0-0.6)	(0.8-1.4)	(1.5-2.1)	(0-0.6)
Laboratory ID				CA14589-OCT188	CA14589-OCT189	CA14589-OCT1810	CA14589-OCT1813	CA14589-OCT1815	CA14589-OCT1816	CA14589-OCT1818	CA14589-OCT1819	CA14589-OCT1822
Aldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlordane	µg/g	0.02	NV	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
DDD	µg/g	0.02	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
DDE	µg/g	0.02	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
DDT	µg/g	0.02	1.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan	µg/g	0.02	NV	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Endrin	µg/g	0.02	NV	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Hexachlorocyclohexane Gamma-	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor	µg/g	0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor Epoxide	µg/g	0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	mS/cm	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachloroethane	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard
Note: Bold. Italic & Underline exceedance of MECP Table 1: Full Depth Background Site Condition Standards for Residential/Parkland/Institutional property use in coarse soil condition.

FIGURES

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Geotechnical Hydrogeological & Environmental Solutions
12700- Keele Street
King City, ON. L7B 1H5
Phone# 905 833 1582, Fax# 905 833 5360

North:

N

Legend:

Property Boundary

Project Title:

Phase Two Environmental Site Assessment

Site Location:

17791 Mount Hope Road, Caledon, ON

Figure Title:

Site Location Plan

Scale:

0m 100m 200m

Project Number:

SP18-334-20

Date:

June 2019

Figure Number:

1

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Phone# 905 833 1582, Fax# 905 833 5360

North:

Legend:

- Property Boundary
- 250m Study Area
- Inferred Shallow Groundwater Flow Direction

PCA on Phase Two Property:

1. #30. Importation of Fill Material of Unknown Quality
2. #40. Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications

Project Title:
Phase Two Environmental Site Assessment

Site Location:
17791 Mount Hope Road, Caledon, ON

Figure Title:
Potentially Contaminating Activities (PCAs)

Scale:	Project Number:
0m — 100m	SP18-334-20
Date: June 2019	**Figure Number:** 2

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Phone# 905 833 1582, Fax# 905 833 5360

North:

Legend:

- Property Boundary
- 250m Study Area
- Inferred Shallow Groundwater Flow Direction

APEC - 1	#30. Importation of Fill Material of Unknown Quality
APEC - 2	#40. Pesticides (including Herbicides Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications

APEC	
APEC-1	
APEC-2	

Project Title:

Phase Two Environmental Site Assessment

Site Location:

17791 Mount Hope Road, Caledon, ON

Figure Title:

Area of Potential Environmental Concerns (APECs)

Scale: 0m – 100m

Project Number: SP18-334-20

Date: June 2019

Figure Number: 3

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North:

Legend:

- Property Boundary
- Borehole
- Monitoring Well

Project Title:

Phase Two Environmental Site Assessment

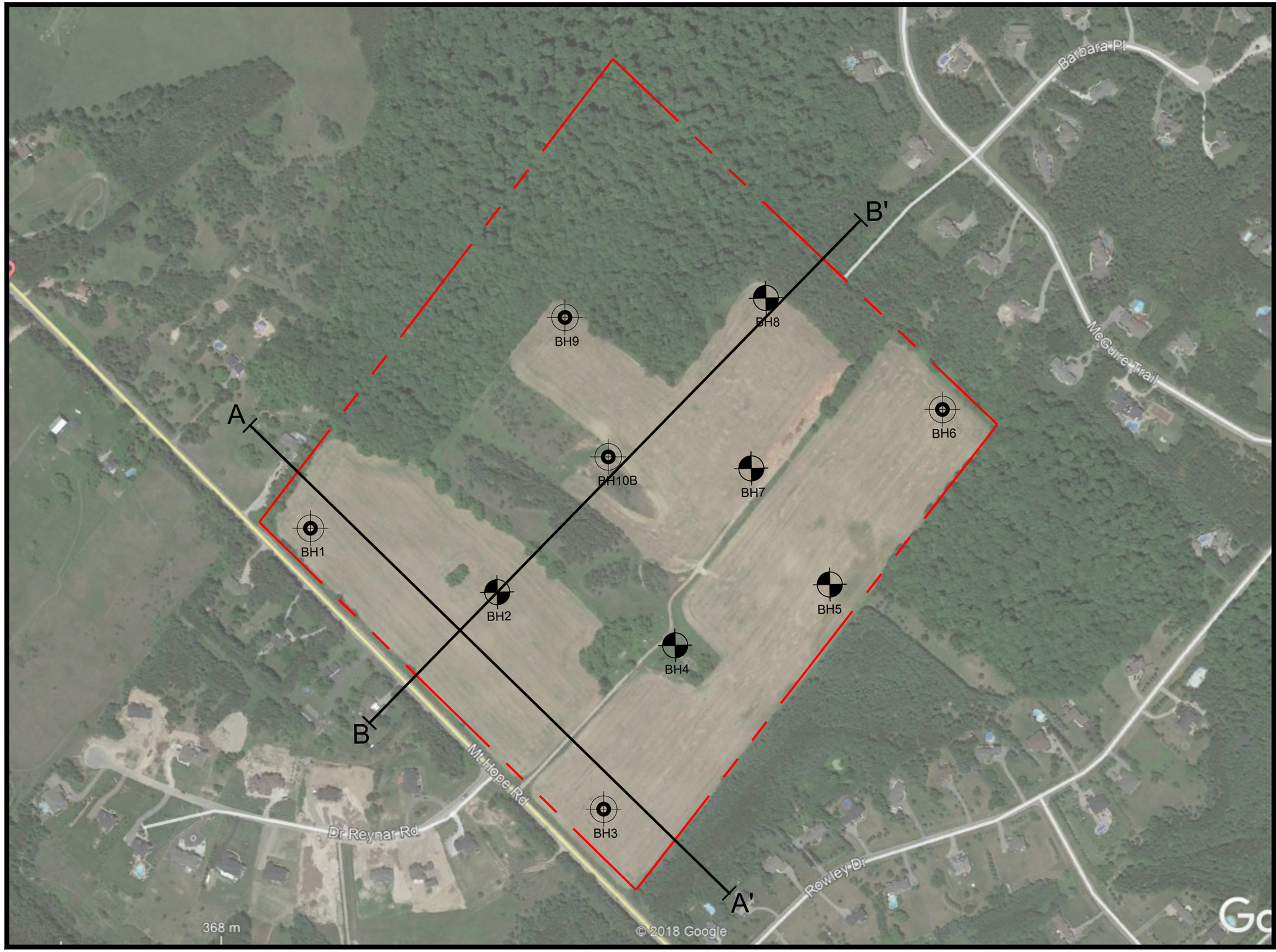
Site Location:

17791 Mount Hope Road, Caledon, ON

Figure Title:

Borehole/ Monitoring Well Location Plan

Scale: 0m 50m 100m	**Project Number:** SP18-334-20
Date: June 2019	**Figure Number:** 4



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North:

N

Legend:

- Property Boundary
- Borehole
- Monitoring Well
- Soil Profile

Project Title:

Phase Two Environmental Site Assessment

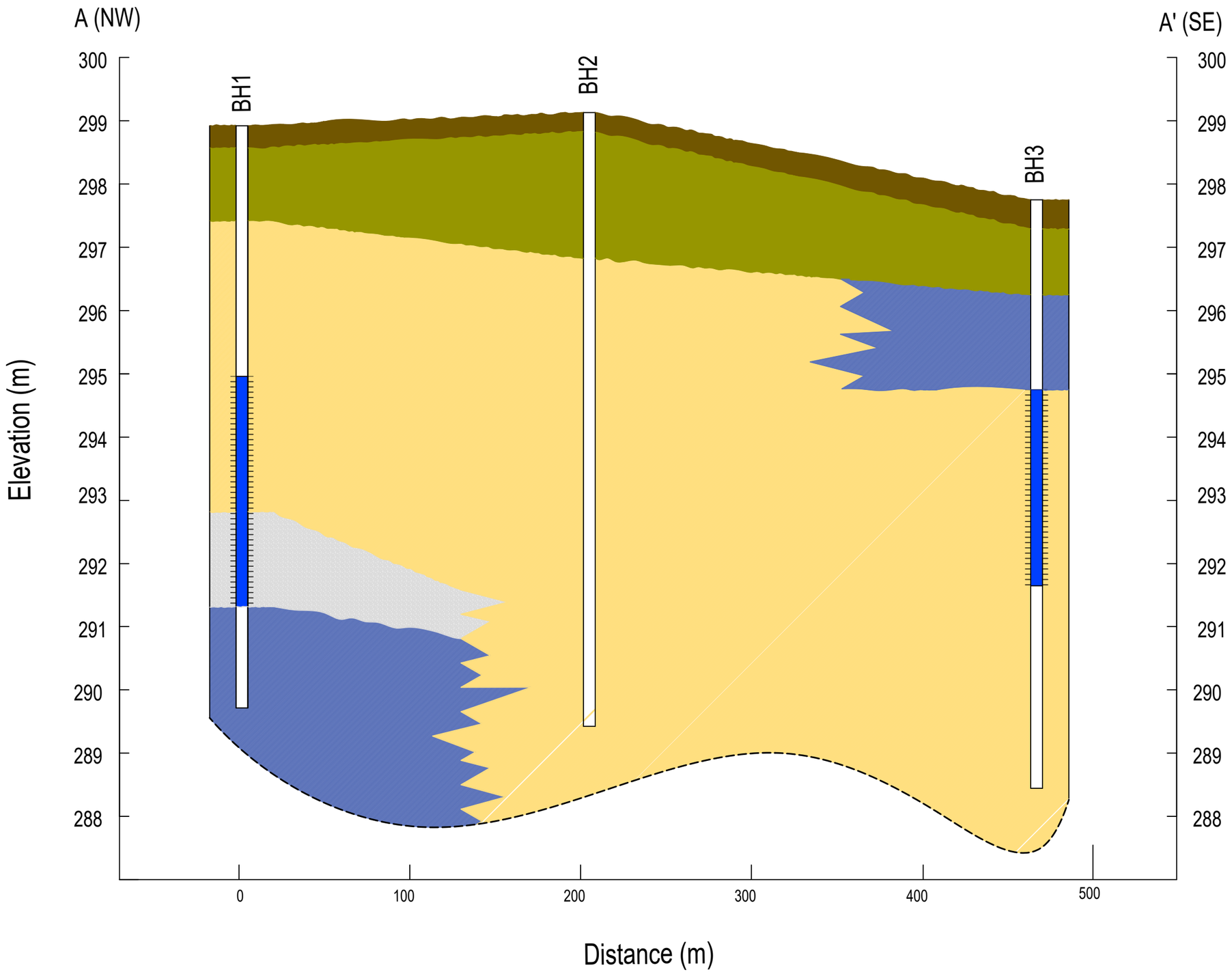
Site Location:

17791 Mount Hope Road, Caledon, ON

Figure Title:

Soil Profile Location Plan

Scale:	Project Number:
0m 50m 100m	SP18-334-20
Date: June 2019	**Figure Number:** 5



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North:

Legend:

- Top Soil
- Fill
- Silt
- Sand
- Gravelly sand

MW1 — Borehole / Well ID

Water Level

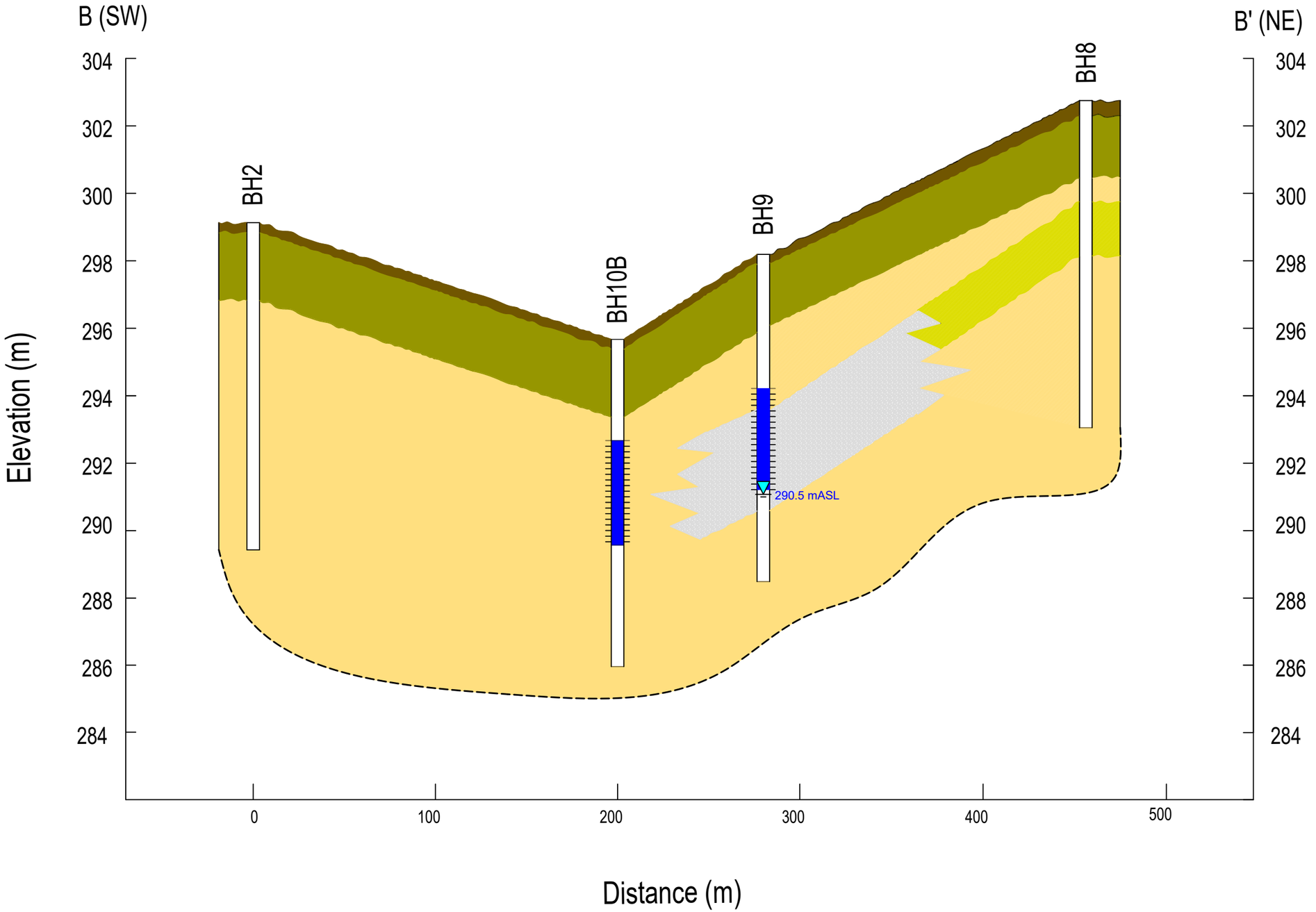
Well Screen

Project Title:
Phase Two Environmental Site Assessment

Site Location:
17791 Mount Hope Road, Caledon, ON

Figure Title:
Soil profile A-A'

Scale:	Project Number:
As Shown	SP18-334-20
Date:	**Figure Number:**
June 2019	6



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North:

Legend:

- Top Soil
- Fill
- Sand
- Gravelly sand
- Silty Sand / Sandy Silt

MW1 ← Borehole / Well ID
Water Level
Well Screen

Project Title:
Phase Two Environmental Site Assessment

Site Location:
17791 Mount Hope Road, Caledon, ON

Figure Title:
Soil profile B-B'

Scale:	Project Number:
As Shown	SP18-334-20
Date:	**Figure Number:**
June 2019	7

APPENDIX A

SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions

SAMPLING AND ANALYSIS PLAN

This Sampling and Analysis Plan is prepared for a Phase Two Environmental Site Assessment (Phase Two) as defined by Ontario Regulation (O. Reg.) 153/04, as amended. The Site is located at 17791 Mount Hope Road, in the Town of Caledon, Ontario. The approximate site location is shown in Figure 1.

The Site is located on the east side of Mount Hope Road, in a rural residential and agricultural area of the Town of Caledon, Ontario, and covers an area of approximately 41.21 hectares (approximately 101.83 acres).

It is understood that the Site will be re-developed in a residential subdivision with residential houses with one (1) level of basement. In support of the development application, a Phase One ESA was conducted at the Site, in general accordance with O. Reg. 153/04 as amended. Based on the Phase One ESA, potentially contaminating activities (PCAs) were identified at the Site, which resulted in areas of potential environmental concern (APECs) to be present on Site. As a result, a Phase Two ESA was recommended to address the environmental issues in the identified APECs.

The Sampling and Analysis Plan has been prepared based on the findings of our Phase One Environmental Site Assessment, which would be presented in a separate report entitled *"Phase One Environmental Site Assessment, Proposed New Development, 17791 Mount Hope Road, Caledon, Ontario",* prepared for Palgrave Estate Homes by SIRATI & Partners Consultants Ltd.

1) OBJECTIVE

The objective of the Phase Two ESA is to determine the soil quality at the Site, as related to the following Areas of Potential Environmental Concerns (APECs) identified in the Phase One ESA by SIRATI:

- APEC-1: In the former building structure area on the Phase One Property, which is related to potential placement of fill materials of unknown quality (Potentially Contaminating Activity PCA#30: Importation of Fill Material of Unknown Quality.

- APEC-2: In the farming area on the Phase One Property, which is related to potential use of pesticides due to farming activities (Potentially Contaminating Activity PCA#40: Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications)

2) SCOPE OF WORK

It should be noted that the Phase Two ESA are to be carried out concurrently with geotechnical investigation. The combined scope of work for the Phase Two ESA and geotechnical investigation includes:

- Locating the underground and overhead utilities.
- Drilling ten (10) boreholes for soil sampling. The boreholes will be drilled to a maximum depth of 10 m below ground surface for geotechnical purpose.
- Installing five (5) monitoring wells for groundwater monitoring (for geotechnical purpose), and if required, for groundwater sampling.
- Collecting and submitting soil samples for chemical analysis of the parameters including metals and inorganics (M&I), and organochlorine-pesticides.
- Conducting elevation survey and groundwater monitoring.
- Reviewing the analytical results and comparing with applicable MECP Standards.
- Preparing the Phase Two ESA report summarizing the result of investigations

3) RATIONALE OF BOREHOLE/MONITORING WELL LOCATIONS AND TESTING

The rationale for the selection of the borehole and monitoring well locations and the analytical parameters is presented in the Table below:

BH	Location	Well Installation	Rationale	Tests on Soil Samples
BH1	In the farming area in APEC-2	Yes	For assessing soil quality and for groundwater monitoring	Metals and inorganics, organochlorine-pesticides
BH2		No	For assessing soil quality	organochlorine-pesticides
BH3		Yes	For assessing soil quality and for groundwater monitoring	organochlorine-pesticides
BH4	In the former building area in APEC-1	No	For assessing soil quality	Metals and inorganics
BH5	In the farming area in APEC-2	No	For assessing soil quality	Metals and inorganics, organochlorine-pesticides
BH6		Yes	For assessing soil quality and for groundwater monitoring	organochlorine-pesticides
BH7		No	For assessing soil quality	organochlorine-pesticides

BH	Location	Well Installation	Rationale	Tests on Soil Samples
BH8		No	For assessing soil quality	organochlorine-pesticides
BH9		Yes	For assessing soil quality in APEC-2; and for groundwater monitoring	Metals and inorganics, organochlorine-pesticides
BH10		Yes	For assessing soil quality; and for groundwater monitoring	Metals and inorganics
Quality Control/Quality Assurance (QA/QC) sample				Metals and inorganics, organochlorine-pesticides

Note: inorganics = electrical conductivity, pH and sodium adsorption ratio (SAR)

4) SOIL SAMPLING PROCEDURES

SIRATI's Standard Operation Procedures (SOPs) will be followed throughout the field investigation (sampling, decontamination of equipment, observation and documentation) including field QA/QC program. SIRATI's Standard Operating Procedure is presented in section 7 of this sampling and analysis plan.

5) DATA QUALITY OBJECTIVES

Sampling and decontamination procedures including QA/QC program should be carried out in accordance with:

• SIRATI's Standard Operating Procedures, as presented in the section 7 below Sampling and Analysis Plan.

• The "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", May 1996, revised December 1996, as amended by O. Reg. 511/09.

Laboratory analytical methods, protocols and procedures should be carried out in accordance with the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act", dated March 9, 2004, amended as of July 1, 2011, in accordance with O. Reg. 511/09 and O. Reg. 269/11.

6) STANDARD OPERATING PROCEDURES (SOPs)

6.1) Test Pit and Trenches

Test pits and trenches are the simplest methods of observing subsurface soils. They consist of excavations performed by hand, backhoe, or dozer. Hand excavations are often performed with posthole diggers or shovels. They offer the advantages of speed and ready access for sampling. They are severely hampered by limitations of depth; and they cannot be used in soft or loose soils, boulders or below the water table.

Upon completion, the excavated test pit should be backfilled with the excavated material or other suitable soil material. The backfilled material should be compacted to avoid excessive future settlements. Tampers or rolling equipment may be used to facilitate compaction of the backfill. Excavations within existing roadways should be backfilled with granular material and compacted in lifts to restore subgrade support and the pavement should be properly patched.

Any test pit or excavated area located near planned structure footings or pavement must be surveyed to determine the precise location of the excavation. This information must be presented in Construction Plans and Special Provisions to ensure the area will be re-excavated and properly compacted to the extent required. In the case of test pits excavated through existing pavements, the pavement should be properly patched. The backfilled material should be compacted to avoid excessive future settlements. Tampers or rolling equipment may be used to facilitate compaction of the backfill. Excavations within existing roadways should be backfilled with granular material and compacted in lifts to restore subgrade support.

Where pits are located in agricultural areas or other areas used to support plant growth, the backhoe operator should be instructed to keep the topsoil (or at least the finer upper-layer of the profile) and overburden separate from any gravel encountered in the pit. Upon completion of the pit, the operator should backfill in a sequence (generally with the coarsest material in the bottom of the pit) such that the backfilled pit area is re-established to support vegetation.

6.1.1) Underground Utilities

Prior to drilling, the public utility service (One Call) and private utility services are contacted. The underground utility services are located and marked out in the field.

6.1.2) Drilling Methods

Solid Flight Auger Borings

Auger borings are advanced into the ground by rotating the auger while simultaneously applying a downward force using either hydraulic or mechanical pressure. The auger is advanced to the desired depth and then withdrawn. Samples of cuttings can be removed from the auger; however, the depth of the sample can only be approximated. These samples are disturbed and should be used only for material identification.

This method is generally used to establish shallow soil strata and water table elevations, or to advance to the desired stratum before Standard Penetration Testing (SPT) or undisturbed sampling

is performed. However, it cannot be used effectively in soft or loose soils below the water table. In addition, this method has limited capabilities in dense, rocky material where it may encounter refusal. See ASTMD 1452 (AASHTO T 203).

A solid stem auger consists of a pipe with spiral flanges welded to the pipe. Each section of auger is referred to as a flight. Flights are typically 1.5 m long, but may be longer depending on the manufacturer. A pin is placed at the junction of each auger flight connecting one to the next. Solid stem augers capable of drilling a hole as large as 1m in diameter are available; however, these larger sizes are not common.

The first auger flight is equipped with a bit with cutters or teeth for cutting through hard, usually consolidated formations. The cutter head is usually slightly larger than the flights.

The auger flights are turned by means of a rotary drive head mounted on a hydraulic feed system that pushes down or pulls back on the flight. The cuttings are brought to the surface by the flights which act as a screw conveyor. As the hole is advanced, more auger flights are added until the hole reaches the desired depth.

To obtain split-spoon samples from solid stem auger borings. The augers must be completely withdrawn at each sampling depth.

Solid stem augers are usually used to advance a hole in stable formations. This method is not effective in unconsolidated material or below the water table because the borehole will collapse when the flights are removed. Solid stem augers are generally not used for installation of monitoring wells and the PM must be consulted if solid stem auger must be used for well installation.

Hollow- Stem Auger Borings

A hollow-stem auger consists of a continuous flight auger surrounding a hollow drill stem. A central “plug”, or “butterfly” bit, at the end of a drill rod is used to prevent soil from entering the hollow stem as the hole is advanced between samples. The hollow-stem auger is advanced in a manner similar to Solid Flight Auger; however, removal of the hollow-stem auger is not necessary for sampling. The “plug”, or “butterfly” bit, is removed and samples are obtained through the hollow drill stem, which acts like a casing to hold the hole open. This increases usage of hollow-stem augers in soft and loose soil. Usually no drilling mud is required, which could otherwise interfere with accurate groundwater level readings. In addition, this method of drilling is extremely fast, cost effective, and requires little to no water.

Below the water table, removal of the center “plug”, or “butterfly” bit, can disturb sand and affect the validity of the SPT. When this condition develops in leading to questionable SPT results, you may add water or drill mud to the inside of the stem to create a reverse head of water and prevent heaving. Water should also be added to the borehole while auguring clayey soils to help prevent “baking” of the material due to the heat generated during rapid advancement of the augers. This “baking” of clay soils can adversely affect the permeability of the subsurface material. Another disadvantage of this method is that refusal may prematurely be encountered in boulders or dense rocky soils. See ASTM D 6151 (AASHTO T 251).

The flights of a hollow stem auger are welded onto a larger diameter pipe which allows drill rods to pass through the centre of the flight. The flights are typically 1.5 m long. A centre plug, or pilot assembly, is inserted in the hollow centre to prevent soil from coming up into the auger during drilling. The centre plug can have a bit attached that helps to advance the auger.

The first auger flight is equipped with a bit with cutters or teeth for cutting through hard formations. The cutter teeth are usually significantly larger than the flights. The centre plug and drill rods can connect through the auger flights to the top-head drive in order to assure that the drill rods and plug rotate with the flights. If using a split-spoon sampler as a centre plug, the sampler must be removed and cleaned prior to sampling. Hollow stem auger flights are advanced in the same manner as are solid stem augers. Hollow stem augers are available with O.D. diameters ranging approximately 15 cm to 55cm.

Hollow stem augers are more versatile than solid stem augers because: they can act as temporary casing to prevent caving and sloughing of the borehole wall; they allow soil samples to be obtained more easily and accurately; small diameter monitoring wells can be installed and sand/gravel packed without the use of casing or drilling fluids; they can be used to drill through unconsolidated formations and below the water table.

Wash Borings

In this method, the boring is advanced by a combination of the chopping action of a light "Fishtail" bit and the jetting action of water flowing through the bit. This method is used only when precise soil information is not required between sample intervals in loose, fine granular material. Generally, casing is required to stabilize the walls of the borehole. Large quantities of water are required for this method of drilling. Generally, there are better, more efficient methods available to drill a borehole.

Mud Rotary Drilling

This method consists of using a rotary drill with rotating thick-walled, hollow, drill rods usually attached to a tri-cone bit. Drilling-mud is circulated from a mud tub, and then through the drilling rods as the drill rod is advanced. The drilling mud lifts the drilling cuttings out of the borehole while maintaining hole stability. The drill cuttings are screened and separated from the drilling mud, which is then recirculated. To collect a sample, the drill rods and bit are pulled out of the hole and are replaced with drill rods and the required sampling device. This method is fast, and provides excellent sampling and in situ testing data due to minimal disturbance to the soils at the bottom of the borehole prior to sampling. It is effective in all soil types except for very gravelly material with cobbles and boulders. No information can be reliably obtained about groundwater levels during the drilling operation, and the soil material between sampling intervals is difficult to observe from the drilling mud return.

Air Drilling

This type of drilling uses compressed air to remove cuttings from the borehole as the drill bit is advanced. Both rotary or percussion techniques can be utilized and either open hole (rotary reverse circulation) or under-reamed casing advancement (ODEX) can be used in the drilling process. SPT

samples can be obtained; however, the materials between samples are highly disturbed. This type of drilling is generally fast, but expensive, and is most useful when drilling deep holes in dense gravels and boulders where traditional Hollow Stem Auger and Mud Rotary techniques cannot drill or sample.

Direct Push

Direct push is a drilling and sampling technique where the tools are driven into the ground. No rotation is involved so all the samples are uncontaminated and there is no drilling debris on the surface. The main application for this method is for drilling various soils, clays and sands both consolidated and unconsolidated. It allows the driller to take a core sample sealed inside a plastic tube so that no handling of the sample takes place. Clean disposal samples tubes must be used for every sample and never reused. Installation of monitoring wells in direct push drilling boreholes where casing is used is acceptable. This method does have limitation when drilling at depth and in hard/stiff formations. Generally, SPT is not completed using a direct push drilling rig and as such is generally not used for geotechnical investigations.

Drilling Techniques for Heaving /Flowing Sand

The drilling techniques used to advance the auger column within heaving sands may vary greatly from those techniques used when drilling in unsaturated materials. Problems may occur when a borehole is advanced to a desired depth without the use of drilling fluids for the purpose of either sampling the formation or installing a monitoring well. As the pilot assembly, or centre plug, is retracted, the hydrostatic pressure within the saturated sand forces water and loose sediments to rise inside the hollow centre of the auger column. These sediments can rise several metres inside the lower auger sections. The resulting “plug” of sediment inside the hollow auger column can interfere with the collection of formation samples, the installation of the monitoring well or even additional drilling.

The difficulties with heaving sands may be overcome by maintaining a positive pressure head within the auger column. A positive pressure head can be created by adding a sufficient amount of clean water or other drilling fluid inside the hollow stem. Clean ‘potable’ water (e.g., water that does not contain analytes of concern to a monitoring program) is usually preferred as the drilling fluid in order to minimize potential interference with samples collected from the completed well.

The head of clean water inside the auger column must exceed the hydrostatic pressure within the sand formation to limit the rise of loose sediments inside the hollow-stem. Where the saturated sand formation is unconfined, the water level inside the auger column is maintained above the elevation of the water table. Where the saturated sand formation is confined, the water level inside the auger column is maintained above the potentiometric surface of the formation. If the potentiometric surface of the formation rises above the ground elevation, however, the heaving sand problem may be very difficult to counteract and may represent a limitation to the use of the drilling method.

6.1.3) Occupational Health and Safety

Prior to drilling, the site is inspected to ensure that no potentially hazardous material is present near/around the drilling area. Safety procedures are reviewed and a safety check of the equipment is conducted including locating the emergency stop button on the drill rig, checking personal protective equipment (hard hats, safety shoes, eye/ear protection), locating the first aid kit and confirming the location of the nearest hospital, and verifying the standard procedure in case of injury.

6.1.4) Drilling Spoils

Excess soil generated during sampling and drilling procedure is stored at the site in metal barrels. If the analytical results indicate the soil is contaminated, a licensed disposal company is notified to collect the barrels of soil for proper disposal

6.1.5) Borehole Abandonment

After drilling, logging and/or sampling, boreholes will be backfilled by the method described below:

- Bentonite is thoroughly mixed into the grout within the specified percentage range. The tremie grout is usually placed into the hole; however, for selected boreholes (e.g., shallow borings well above the water table) at certain sites, the grout may be allowed to free fall, taking care to ensure the grout does not bridge and form gaps or voids in the grout column.
- The volume of the borehole is calculated and compared to the grout volume used during grouting to aid in verifying that bridging did not occur.
- When using a tremie to place grout in the borehole, the bottom of the tremie is submerged into the grout column and withdrawn slowly as the hole fills with grout. If allowing the grout to free fall (and not using a tremie), the grout is poured slowly into the boring. The rise of the grout column is visually monitored or sounded with a weighted tape.
- If the method used to drill the boring utilized a drive casing, the casing is slowly extracted during grouting such that the bottom of the casing does not come above the top of the grout column.
- During the grouting process, no contaminating material (oil, grease, or fuels from gloves, pumps, hoses, et. al) is permitted to enter the grout mix and personnel wear personal protective equipment as specified in the Project Health and Safety Plan.
- Following grouting, barriers are placed over grouted boreholes as the grout is likely to settle in time, creating a physical hazard. Grouted boreholes typically require at least a second visit to ‘top off’ the hole.
- The surface hole condition should match the pre-drilling condition (asphalt, concrete, or smoothed flush with native surface), unless otherwise specified in the project work plans.

6.1.6) Subsurface Obstruction

Where refusal to drilling occurs due to rock, foundation or underground services, and the borehole is relocated within 2.0 m downstream from the original borehole location.

6.2) Soil Sampling

6.2.1) Introduction

Soil sampling is conducted in accordance with the "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, May 1996" as revised December 1996 (MOE Guidance Manual) and as amended by O. Reg. 366/05, 66/08, 511/09, 245/10, 179/11, 269/11 and 333/13. The sampling procedures are described herein.

6.2.2) Drilling Rig Decontamination

➢ Geoprobe

One-time use Shelby tube (thin-walled) samples are recovered from the boreholes in clear disposable PVC liners to prevent cross-contamination.

➢ CME 55

Drilling equipment such as drill rigs, augers, drill pipes, drilling rods and split-spoons are decontaminated prior to initial use, between borehole locations and at the completion of drilling activities. The drilling equipment is manually scrubbed with a brush using a phosphate-free solution and thoroughly steam cleaned and/or power washed to remove any foreign material and potential contaminants. In addition, the spiltspoon sampler and any sub-sampling equipment are decontaminated prior to each usage. Various solutions are used for sampling equipment decontamination as described below:

- Phosphate-free soap solution (i.e., Alconox), tap water and distilled water are used for suspected petroleum hydrocarbon soil sampling.
- A reagent-grade methanol solution and distilled water are used for suspected VOCs soil sampling. The reinstate waste is collected.
- Reagent-grade 10% nitric acid solution and distilled water are used for suspected metals soil

sampling. The reinstate waste will be collected.

7.2.3) Sample Logging and Field Screening

Samples are typically collected at 1.5 m intervals in the overburden. Tactile examination of the samples is made to classify the soil, and a log is recorded for each borehole detailing the physical characteristics of the soil including colour, soil type, structure, and any observed staining or odour. The organic vapour readings, the moisture content of the samples as determined in the laboratory,

the groundwater and cave-in levels measured at the time of investigation, and the groundwater monitoring well construction details are given on the borehole logs.

7.2.4) Field Screening and Calibration Procedures

The soil samples are classified based on physical characteristics including colour, soil type, moisture, and visible observation of staining and/or odour. In addition, the organic vapour reading for each soil sample is determined using a gas detector. Based on the overall soil physical characteristics, representative soil sample are selected for chemical analysis.

The organic vapour readings are measured using a portable RKI Eagle gas detector, TYPE 101 set to include all gases, and having a minimum detection of 2 ppm. Prior to Sampling and Analysis Plan measurement, the detector is calibrated using a Hexane 40% LEL gas. The allowable range of calibration is 38% to 42%.

6.2.5) Soil Sampling

The soil from the disposable sampler liner is handled using new disposable gloves in order to avoid the risk of cross-contamination between the samples. Sufficient amounts of the soil samples are placed into clean glass jars with Teflon lined lids for analyses of polychlorinated biphenyls, polyaromatic hydrocarbons, moisture content, medium to heavy PHCs, and metals and inorganics.

Small amounts of the soil samples are collected using a disposable 'T'-shaped Terracore sampler and stored in methanol or sodium bisulfate vials for light PHCs (CCME F1) and VOCs analysis, respectively; the remainder of the samples is placed into a sealable bag for vapour measurement and soil classification. The samples are stored in an insulated container with ice after sampling and during shipment to the laboratory.

The minimum requirements for the number, type and frequency of field quality control are given below:

- Field Blanks: Field blank samples for VOCs analysis are prepared to confirm that no contamination takes place during the soil sampling procedure.
- Field Duplicates: At least 1 field duplicate sample is collected and submitted for laboratory analysis for every 10 soil samples that are collected to ensure the soil sampling technique is accurate.

6.3) Well Installation and Groundwater Sampling

6.3.1) Introduction

The well installation procedures are described herein.

6.3.2) Screen and Riser Pipe

Monitoring wells are constructed from individually wrapped 38 or 50 mm inside diameter (ID) schedule 40 polyvinyl chloride (PVC) flush threaded casing equipped with O-rings. The screen consists of casing material which is factory slotted (slot width = 0.25 mm) to permit the entry of water into the well. The bottom of the screens is equipped with threaded end caps. The appropriate

number of risers is coupled with the screen section(s) via threaded joints to construct the well. The top of the wells are tightly capped using a locking well cap, which prevents the infiltration of surface water and foreign material into the well and also provides security. A watertight, traffic-rated protective casing is installed over each monitoring well within a concrete pad extending approximately 0.5 mbgs. No PVC cements or other solvent based cements are used in the construction of the monitoring wells.

6.3.3) Well Materials Decontamination

Dedicated sampling equipment, such as submersible pumps, are decontaminated prior to installation inside monitoring wells. Where factory-cleaned, hermetically sealed materials are used, no decontamination is conducted.

Setting Screen, Riser Casings and Filter Materials

At total depth, the soil cuttings are removed through circulation or rapidly spinning the augers prior to constructing the well. The drill pipe and bit or centre bit boring is removed. The well construction materials are then installed inside the open borehole or through the centre of the drive casing or augers.

After the monitoring well assembly is lowered to the bottom of the borehole, the filter pack is added until its height is approximately two feet above the top of the screen, and placement is verified. The filter pack is then surged using a surge block or swab in order to settle the pack material and reduce the possibility of bridging.

Setting Seals and Grouting

Once the top of the filter pack is verified to be in the correct position, a bentonite seal is placed above the filter pack. The seal is allowed to hydrate for at least one hour before proceeding with the grouting operation.

After hydration of the bentonite seal, grout is then pumped through a tremie pipe and filled from the top of the bentonite seal upward. The bottom of the tremie pipe should be maintained below the top of the grout to prevent free fall and bridging. When using drive casing or hollow-stem auger techniques, the drive casing/augers should be raised in incremental intervals, keeping the bottom of the drive casing/augers below the top of the grout. Grouting will cease when the grout level has risen to within approximately one to two feet of the ground surface, depending on the surface completion type (flush-mount versus above-ground). Grout levels are monitored to assure that grout taken into the formation is replaced by additional grout.

Capping the Wells

For above-ground completions, the protective steel casing will be centered on the well casing and inserted into the grouted annulus. Prior to installation, a 2-inch deep temporary spacer may be placed between the PVC well cap and the bottom of the protective casing cover to keep the protective casing from settling onto the well cap. A minimum of 24 hours after grouting should elapse before installation of the concrete pad and steel guard posts for aboveground completions, or street boxes or vaults for flush mount completions. For above-ground completions, a concrete

pad, usually 3-foot by 3-foot by 4-inch thick, is constructed at ground surface around the protective steel casing. The concrete is sloped away from the protective casing to promote surface drainage from the well.

For flush-mount (or subgrade) completions, a street box or vault is set and cemented in position. The top of the street box or vault will be raised slightly above grade and the cement sloped to grade to promote surface drainage away from the well.

Documentation of Monitoring Well Configuration

The following information is recorded:

- Length of well screen
- Total depth of well boring
- Depth from ground surface to top of grout or bentonite plug in bottom of borehole (if present)
- Depth to base of well string
- Depth to top and bottom of well screen

APPENDIX B

SIRATI & PARTNERS

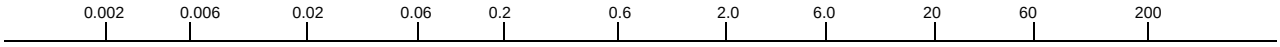
Geotechnical Hydrogeological & Environmental Solutions

Enclosure No. 1: Notes On Sample Descriptions

1. All sample descriptions included in this report follow the Canadian Foundations Engineering Manual soil classification system. This system follows the standard proposed by the International Society for Soil Mechanics and Foundation Engineering. Laboratory grain size analyses provided by Sirati & Partners Consultants Limited also follow the same system. Different classification systems may be used by others; one such system is the Unified Soil Classification. Please note that, with the exception of those samples where a grain size analysis has been made, all samples are classified visually. Visual classification is not sufficiently accurate to provide exact grain sizing or precise differentiation between size classification systems.

ISSMFE SOIL CLASSIFICATION

CLAY	SILT			SAND			GRAVEL			COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE	FINE	MEDIUM	COARSE		



EQUIVALENT GRAIN DIAMETER IN MILLIMETRES

CLAY (PLASTIC) TO	FINE	MEDIUM	CRS.	FINE	COARSE
SILT (NONPLASTIC)	SAND			GRAVEL	

UNIFIED SOIL CLASSIFICATION

2. Fill: Where fill is designated on the borehole log it is defined as indicated by the sample recovered during the boring process. The reader is cautioned that fills are heterogeneous in nature and variable in density or degree of compaction. The borehole description may therefore not be applicable as a general description of site fill materials. All fills should be expected to contain obstruction such as wood, large concrete pieces or subsurface basements, floors, tanks, etc., none of these may have been encountered in the boreholes. Since boreholes cannot accurately define the contents of the fill, test pits are recommended to provide supplementary information. Despite the use of test pits, the heterogeneous nature of fill will leave some ambiguity as to the exact composition of the fill. Most fills contain pockets, seams, or layers of organically contaminated soil. This organic material can result in the generation of methane gas and/or significant ongoing and future settlements. Fill at this site may have been monitored for the presence of methane gas and, if so, the results are given on the borehole logs. The monitoring process does not indicate the volume of gas that can be potentially generated nor does it pinpoint the source of the gas. These readings are to advise of the presence of gas only, and a detailed study is recommended for sites where any explosive gas/methane is detected. Some fill material may be contaminated by toxic/hazardous waste that renders it unacceptable for deposition in any but designated land fill sites; unless specifically stated the fill on this site has not been tested for contaminants that may be considered toxic or hazardous. This testing and a potential hazard study can be undertaken if requested. In most residential/commercial areas undergoing reconstruction, buried oil tanks are common and are generally not detected in a conventional geotechnical site investigation.

3. Till: The term till on the borehole logs indicates that the material originates from a geological process associated with glaciation. Because of this geological process the till must be considered heterogeneous in composition and as such may contain pockets and/or seams of material such as sand, gravel, silt or clay. Till often contains cobbles (60 to 200 mm) or boulders (over 200 mm). Contractors may therefore encounter cobbles and boulders during excavation, even if they are not indicated by the borings. It should be appreciated that normal sampling equipment cannot differentiate the size or type of any obstruction. Because of the horizontal and vertical variability of till, the sample description may be applicable to a very limited zone; caution is therefore essential when dealing with sensitive excavations or dewatering programs in till materials.

LOG OF BOREHOLE BH 1

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/19/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 2

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
298.9								2 4 6 8 10	10 20 30			
0.0 / 298.6	**TOPSOIL:**350 mm		1	SS	5							
0.4	**SAND (REWORKED):** trace gravel, brown, moist, loose											
1	possibly reworked, becoming light brown		2	SS	5		298					
297.4												
1.5	**SAND:** light brown, moist, compact		3	SS	7		297					
2	trace gravel		4	SS	11							
3	becoming brown		5	SS	15		296					2 93 1 4
4							295					
5	some gravel		6	SS	23		294					
6 / 292.8												
6.1	**GRAVELLY SAND:** trace cobbles, brown, moist, compact		7	SS	19		293					
7 / 291.3							292					
7.6	**SILT:** greyish brown, trace gravel, very moist to wet, very dense		8	SS	74		291					
8 / 289.7							290					
9.2	**END OF BOREHOLE:**		9	SS	50/75 mm							

Notes:
1. Borehole was open and dry upon completion of drilling.
2. Monitoring well was installed in the borehole upon completion of drilling.
3. Monitoring well was dry on November 1, 2018 and November 28, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 2

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/19/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 3

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
299.1								2 4 6 8 10	10 20 30			
0.0 / 298.8	**TOPSOIL:** 300 mm		1	SS	4		299					IBL in ppm
0.3	**FILL:** topsoil mixed with silty sand to sand, brown, moist											
	SAND (REWORKED): trace silt, light brown, moist		2	SS	4		298					
296.8			3	SS	8		297					
2.3	**SAND:** light brown, moist, compact to dense		4	SS	15							
			5	SS	21		296					
	some gravel, trace cobbles, becoming brown		6	SS	21		295					7 85 3 5
	trace gravel		7	SS	25		294					
	trace cobbles		8	SS	21		293					
	some gravel		9	SS	31		292					
289.4							291					
9.7	**END OF BOREHOLE:**						290					

Notes:
1. Borehole was open and dry upon completion of drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 3

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/18/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 4

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
297.8								2 4 6 8 10	10 20 30			
0.0 / 297.3	**TOPSOIL:** 450 mm		1	SS	5							IBL in ppm
0.5 / 296.3	**FILL:** silty sand, trace gravel, dark brown, very moist to moist becomig sandy silt, trace clay, brown, moist		2	SS	6		297					
1.5 / 294.8	**SANDY SILT TO SILTY SAND:** trace clay, brown, moist, loose to compact		3	SS	7		296					
			4	SS	18		295					1 61 30 8
3.0	**SAND:** trace gravel, trace silt, light brown, very moist, compact to very dense		5	SS	16		294					
	trace to some gravel, trace cobbles		6	SS	29		293					
			7	SS	40		292					
			8	SS	31		291					
288.5			9	SS	50/75 mm		290					
9.3	**END OF BOREHOLE:**						289					

Notes:
1. Borehole was open and dry upon completion of drilling.
2. Monitoring well was installed in the borehole upon completion of drilling.
3. Monitoring well was dry on November 1, 2018 and November 28, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 4

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/18/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 5

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT (w_P, w, w_L) WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
298.5								2 4 6 8 10	10 20 30			
0.0	**FILL:** sandy silt, trace gravel, trace topsoil, brown, moist		1	SS	7		298					IBL in ppm
1	**POSSIBLE FILL:** silty sand, trace cobbles, trace gravel, brown		2	SS	32							
297.0							297					
1.5	**SAND:** light brown, moist, compact to dense		3	SS	27							
2			4	SS	32		296					
3	trace gravel		5	SS	17		295					
4							294					
5			6	SS	12							
6	some gravel		7	SS	31		293					
7							292					
8			8	SS	40		291					
9	trace gravel		9	SS	26		290					
288.8							289					
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was open and dry upon completion of drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 5

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/18/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 6

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
294.1								2 4 6 8 10	10 20 30			
0.0 / 293.8	**TOPSOIL:** 300 mm		1	SS	5		294					
0.3	**FILL:** silty sand, yellowish brown, moist											
1	sandy silt, trace clay, light brown, very moist to wet		2	SS	5		293					
292.6												
1.5	**CLAYEY SILT** some sand, trace cobbles, trace gravel, light brown, very moist, firm		3	SS	7							2 17 54 27
2 / 291.8							292					
2.3	**SAND:** light brown, moist, compact		4	SS	13							
3			5	SS	11		291					
4							290					
5	trace gravel		6	SS	16		289					
6							288					
7			7	SS	28							
286.5							287					
7.6	**SANDY SILT:** brown, moist, dense		8	SS	32							1 28 65 6
8 / 285.0							286					
9.1	**SILT:** trace sand, brown, very moist, very dense		9	SS	52		285					1 10 80 9
284.4												
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was dry and open upon completion of drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 6

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/18/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 7

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	WATER CONTENT (%) PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
299.9								2 4 6 8 10	10 20 30			
0.0 / 299.6	**TOPSOIL:** 300 mm		1	SS	5							IBL in ppm
0.3	**SAND (REWORKED):** trace gravel, trace silt, dark brown, moist											
1	becoming brown		2	SS	2		299					
2	becoming light brown		3	SS	0		298					
297.6												
2.3 / 296.9	**FILL:** silty sand, light brown, moist		4	SS	2		297					
3.0	**SAND:** some silt, light brown, moist, compact to very dense		5	SS	11							
4							296					
5			6	SS	19		295					
6							294					
7			7	SS	36		293					
8			8	SS	59		292					
9	beoming greyish brown, very moist		9	SS	52		291					
290.2												
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was dry and open upon completion of drilling.
2. Monitoring well was installed in the borehole upon completion of drilling.
3. Borehole was dry on November 1, 2018 and November 27, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 7

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/19/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 8

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION
298.9 / 0.0	**TOPSOIL:** 300 mm		1	SS	5		298
298.6 / 0.3	**SAND (REWORKED):** trace silt, brown, moist, loose						
298.1 / 0.8	**SAND:** trace silt, light brown, moist		2	SS	11		
			3	SS	16		297
			4	SS	24		
	some silt, wet		5	SS	32		296
294.3 / 4.6	**SANDY SILT:** brown, wet, compact		6	SS	30		295
			7	SS	18		294
291.3 / 7.6	**SAND:** brown, wet to moist, compact		8	SS	23		293
289.8 / 9.1	**GRAVELLY SAND:** brown, moist, very dense		9	SS	60		292
289.2 / 9.7	**END OF BOREHOLE:**						291
	Notes: 1. Borehole was dry and open upon completion of drilling.						290

Head Space Combustible Vapor Reading (ppm)
2 4 6 8 10

PLASTIC LIMIT w_P | NATURAL MOISTURE CONTENT w | LIQUID LIMIT w_L
WATER CONTENT (%)
10 20 30

POCKET PEN. (Cu) (kPa)
NATURAL UNIT WT (kN/m³)
REMARKS AND GRAIN SIZE DISTRIBUTION (%)
GR SA SI CL

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES
+ 3, × 3: Numbers refer to Sensitivity
○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 8

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/18/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 9

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	SAMPLES NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
302.8								2 4 6 8 10	10 20 30			
0.0 / 302.3	**TOPSOIL:** 450 mm		1	SS	6				○			
0.5	**FILL:** silty sand, trace topsoil, dark brown, moist		2	SS	2		302		○			
1			3	SS	2		301		○			
2 / 300.5												
2.3 / 299.8	**SAND:** trace cobbbles, trace gravel, light brown, moist, compact		4	SS	16		300		○			
3.0	**SILTY SAND:** light brown, very moist, compact		5	SS	14				○			
4 / 298.2							299					
4.6	**SAND:** light brown, moist, compact to dense		6	SS	12		298		○			
5												
6			7	SS	9		297		○			
7							296					
8			8	SS	42		295		○			
9							294					
293.1			9	SS	31				○			
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was dry and open upon completion of drilling.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^{3}$, $\times^{3}$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 9

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/19/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 10

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS/0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT w_P / NATURAL MOISTURE CONTENT w / LIQUID LIMIT w_L — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
298.2								2 4 6 8 10	10 20 30			
0.0 / 297.9	**TOPSOIL:** 300 mm		1	SS	6		298					
0.3	**FILL:** sandy silt to silty sand, trace topsoil, dark brown, wet		2	SS	3		297					
1			3	SS	4							
2 / 295.9							296					
2.3	**SAND:** light brown, moist, compact		4	SS	15							
3			5	SS	29		295					
4 / 293.6							294					
4.6	**GRAVELLY SAND :** trace cobbles, light brown, moist, dense		6	SS	35							
5							293					
6			7	SS	25		292					
7 / 290.6							291					
7.6	**SAND:** trace silt, light brown, moist, dense		8	SS	41							
8							290					
9	trace gravel		9	SS	43		289					
288.5												
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was dry and open upon completion of drilling.
2. Monitoring well was installed in the borehole upon completion of drilling.
3. Monitoring well was dry on November 1, 2018, and November 27, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: $+^3$, $\times^3$: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

LOG OF BOREHOLE BH 10B

PROJECT: Proposed Residential Development
CLIENT: Palgrave Estate
PROJECT LOCATION: Mount Hope Rd., Caledon, Ontario
DATUM: Geodetic
BH LOCATION: See Drawing 1

DRILLING DATA
Method: Solid Stem Augers
Diameter: 150 mm
Date: Oct/19/2018
Drilling Contractor:

REF. NO.: SP18-334-10
ENCL NO.: 11

(m) ELEV / DEPTH	DESCRIPTION	STRATA PLOT	NUMBER	TYPE	"N" BLOWS / 0.3 m	GROUND WATER CONDITIONS	ELEVATION	Head Space Combustible Vapor Reading (ppm)	PLASTIC LIMIT / NATURAL MOISTURE CONTENT / LIQUID LIMIT — WATER CONTENT (%)	POCKET PEN. (Cu) (kPa)	NATURAL UNIT WT (kN/m³)	REMARKS AND GRAIN SIZE DISTRIBUTION (%) GR SA SI CL
295.7								2 4 6 8 10	10 20 30			
0.0 / 295.4	**TOPSOIL:** 300 MM		1	SS	6		295					
0.3	**FILL:** topsoil mixed with silty sand, reddish brown, very moist, loose											
1	**SAND (REWORKED):** brown, very moist, very loose		2	SS	0							
2 / 293.4			3	SS	0		294					
2.3	**SAND:** brown, moist to very moist, very loose to very dense		4	SS	4		293					
3	trace cobbles		5	SS	5							
4							292					
5	trace gravel		6	SS	9		291					
6							290					
7			7	SS	18		289					
8	some gravel, trace clay, light brown		8	SS	50/125 mm		288					3 88 2 7
9	some silt (pockets)		9	SS	38		287					
286.0							286					
9.7	**END OF BOREHOLE:**											

Notes:
1. Borehole was dry and open upon completion of drilling.
2. Monitoring well was installed in the borehole upon completion of drilling.
3. Borehole was dry on November 1, 2018 and November 27, 2018.

GROUNDWATER ELEVATIONS
Measurement 1st 2nd 3rd 4th

GRAPH NOTES: +3, ×3: Numbers refer to Sensitivity; ○ ε=3% Strain at Failure

SPCL SOIL LOG /W VOC 0~12 PPM-2016 SP18-334-10.GPJ SPCL.GDT 12/5/18

APPENDIX C

SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions

FINAL REPORT

CA14589-OCT18 R

SP18-334-20

Prepared for

Sirati & Partners Consultants Ltd

FINAL REPORT

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	Sirati & Partners Consultants Ltd	Project Specialist	Rob Irwin B.Sc., C.Chem
		Laboratory	SGS Canada Inc.
Address	12700 Keele Street King City, ON L7B 1H5. Canada	Address	185 Concession St., Lakefield ON, K0L 2H0
Contact	Nazanin Sajdeh	Telephone	2361
Telephone	905-833-1582	Facsimile	705-652-6365
Facsimile	905-833-5360	Email	
Email	nazanin@sirati.ca; giorgio@sirati.ca	SGS Reference	CA14589-OCT18
Project	SP18-334-20	Received	10/25/2018
Order Number		Approved	11/01/2018
Samples	Soil (15)	Report Number	CA14589-OCT18 R
		Date Reported	11/01/2018

COMMENTS

CCME Method Compliance: Analyses were conducted using analytical procedures that comply with the Reference Method for the CWS for Petroleum Hydrocarbons in Soil and have been validated for use at the SGS laboratory, Lakefield, ON site.

Quality Compliance: Instrument performance / calibration quality criteria were met and extraction and analysis limits for holding times were met.

nC6 and nC10 response factors within 30% of response factor for toluene: YES

nC10, nC16 and nC34 response factors within 10% of the average response for the three compounds: YES

C50 response factors within 70% of nC10 + nC16 + nC34 average: YES

Linearity is within 15%: YES

F4G - gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.
The results for F4 and F4G are both reported and the greater of the two values is to be used in application to the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

Temperature of Sample upon Receipt: 4 degrees C
Cooling Agent Present:Yes
Custody Seal Present:Yes

SIGNATORIES

Rob Irwin B.Sc., C.Chem

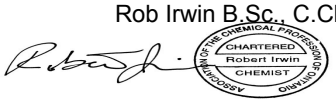


TABLE OF CONTENTS

Client: Sirati & Partners Consultants Ltd

Project: SP18-334-20

Project Manager: Nazanin Sajdeh

Samplers: Tecle

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	8	11	12	13	14	17	19	20
				Sample Name	BH1-SS1	BH3-SS4	BH4-SS2	BH5-SS3	BH6-SS1	BH7-SS2	BH9-SS3	BH10-SS2
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	19/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	19/10/2018	19/10/2018
					Result	Result	Result	Result	Result	Result	Result	Result
Hydrides												
Antimony	µg/g	0.8	1.3		< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Arsenic	µg/g	0.5	18		1.7	1.1	0.9	2.2	0.8	1.2	2.7	0.6
Selenium	µg/g	0.7	1.5		< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7	< 0.7

PACKAGE: **REG153 - Hydrides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	21
				Sample Name	DUP 1
				Sample Matrix	Soil
				Sample Date	19/10/2018
					Result
Hydrides					
Antimony	µg/g	0.8	1.3		< 0.8
Arsenic	µg/g	0.5	18		0.9
Selenium	µg/g	0.7	1.5		< 0.7

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Parameter	Units	RL	L1	Sample Number	8	9	10	11	12	13	14	15
				Sample Name	BH1-SS1	BH2-SS1	BH3-SS3	BH3-SS4	BH4-SS2	BH5-SS3	BH6-SS1	BH6-SS2
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018
					Result	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics												
Moisture Content	%	-			13.7	10.1	13.4	14.4	8.0	19.0	10.9	2.2
Barium	µg/g	0.1	220		15			8.7	6.9	41	21	
Beryllium	µg/g	0.02	2.5		0.15			0.11	0.08	0.26	0.15	
Boron	µg/g	1	36		2			2	2	4	1	

Client: Sirati & Partners Consultants Ltd
Project: SP18-334-20
Project Manager: Nazanin Sajdeh
Samplers: Tecle

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	9	10	11	12	13	14	15
	Sample Name	BH1-SS1	BH2-SS1	BH3-SS3	BH3-SS4	BH4-SS2	BH5-SS3	BH6-SS1	BH6-SS2
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Metals and Inorganics (continued)										
Cadmium	µg/g	0.02	1.2	0.06		0.02	< 0.02	0.05	0.06	
Chromium	µg/g	0.5	70	6.6		5.0	3.7	12	6.5	
Cobalt	µg/g	0.01	21	2.4		1.9	1.4	5.7	2.1	
Copper	µg/g	0.1	92	6.3		4.4	3.4	11	3.6	
Lead	µg/g	0.1	120	3.1		2.0	1.8	4.3	3.5	
Molybdenum	µg/g	0.1	2	0.1		0.1	< 0.1	0.1	0.1	
Nickel	µg/g	0.5	82	4.5		3.6	2.7	12	3.9	
Silver	µg/g	0.05	0.5	< 0.05		< 0.05	< 0.05	< 0.05	< 0.05	
Thallium	µg/g	0.02	1	0.04		0.03	< 0.02	0.09	0.03	
Uranium	µg/g	0.002	2.5	0.39		0.29	0.30	0.38	0.30	
Vanadium	µg/g	3	86	15		12	9	20	14	
Zinc	µg/g	0.7	290	15		9.7	7.7	25	17	
Water Soluble Boron	µg/g	0.5		< 0.5		< 0.5	< 0.5	< 0.5	< 0.5	

Client: Sirati & Partners Consultants Ltd

Project: SP18-334-20

Project Manager: Nazanin Sajdeh

Samplers: Tecle

PACKAGE: **REG153 - Metals and Inorganics** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number				16	17	18	19	20	21	22	
Sample Name				BH7-SS1	BH7-SS2	BH8-SS2	BH9-SS3	BH10-SS2	DUP 1	Dup 2	
Sample Matrix				Soil	Soil	Soil	Soil	Soil	Soil	Soil	
Sample Date				19/10/2018	19/10/2018	18/10/2018	19/10/2018	19/10/2018	19/10/2018	19/10/2018	
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	
Metals and Inorganics											
Moisture Content	%	-		12.6	9.2	8.4	20.7	11.0	8.2	10.5	
Barium	µg/g	0.1	220		8.9		38	26	6.4		
Beryllium	µg/g	0.02	2.5		0.11		0.32	0.20	0.08		
Boron	µg/g	1	36		2		4	< 1	2		
Cadmium	µg/g	0.02	1.2		0.03		0.06	0.03	0.04		
Chromium	µg/g	0.5	70		4.9		15	6.3	3.7		
Cobalt	µg/g	0.01	21		2.2		6.6	2.0	1.4		
Copper	µg/g	0.1	92		6.0		14	2.3	3.0		
Lead	µg/g	0.1	120		2.2		5.3	2.8	1.8		
Molybdenum	µg/g	0.1	2		0.1		0.2	< 0.1	< 0.1		
Nickel	µg/g	0.5	82		4.3		14	3.5	2.7		
Silver	µg/g	0.05	0.5		< 0.05		< 0.05	< 0.05	< 0.05		
Thallium	µg/g	0.02	1		0.04		0.11	0.03	0.02		
Uranium	µg/g	0.002	2.5		0.32		0.42	0.21	0.26		
Vanadium	µg/g	3	86		11		23	12	9		
Zinc	µg/g	0.7	290		12		31	10	7.9		
Water Soluble Boron	µg/g	0.5			< 0.5		< 0.5	< 0.5	< 0.5		

Client: Sirati & Partners Consultants Ltd
Project: SP18-334-20
Project Manager: Nazanin Sajdeh
Samplers: Tecle

PACKAGE: **REG153 - Organochlorine Pests (OCs)**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number	8	9	10	13	15	16	18	19
	Sample Name	BH1-SS1	BH2-SS1	BH3-SS3	BH5-SS3	BH6-SS2	BH7-SS1	BH8-SS2	BH9-SS3
	Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date	19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	18/10/2018	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Organochlorine Pests (OCs)									
Aldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
alpha-Chlordane	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
gamma-Chlordane	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Chlordane (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o,p-DDD	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
pp-DDD	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
DDD (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
o,p-DDE	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
pp-DDE	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
DDE (total)	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
op-DDT	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
pp-DDT	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
DDT (total)	µg/g	0.05	1.4	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
gamma-BHC	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Endosulfan I	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Endosulfan II	µg/g	0.02		< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02	< 0.02
Endrin	µg/g	0.04	0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Heptachlor	µg/g	0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Heptachlor epoxide	µg/g	0.01	0.05	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobenzene	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Hexachlorobutadiene	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

PACKAGE: **REG153 - Organochlorine Pests (OCs)**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	8	9	10	13	15	16	18	19
			Sample Name	BH1-SS1	BH2-SS1	BH3-SS3	BH5-SS3	BH6-SS2	BH7-SS1	BH8-SS2	BH9-SS3
			Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
			Sample Date	19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	18/10/2018	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Organochlorine Pests (OCs) (continued)											
Hexachloroethane	µg/g	0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Methoxychlor	µg/g	0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

PACKAGE: **REG153 - Organochlorine Pests (OCs)**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

			Sample Number	22		
			Sample Name	Dup 2		
			Sample Matrix	Soil		
			Sample Date	19/10/2018		
Parameter	**Units**	**RL**	**L1**	**Result**		
Organochlorine Pests (OCs)						
Aldrin	µg/g	0.05	0.05	< 0.05		
alpha-Chlordane	µg/g	0.02		< 0.02		
gamma-Chlordane	µg/g	0.02		< 0.02		
Chlordane (total)	µg/g	0.05	0.05	< 0.05		
o,p-DDD	µg/g	0.02		< 0.02		
pp-DDD	µg/g	0.02		< 0.02		
DDD (total)	µg/g	0.05	0.05	< 0.05		
o,p-DDE	µg/g	0.02		< 0.02		
pp-DDE	µg/g	0.02		< 0.02		
DDE (total)	µg/g	0.05	0.05	< 0.05		
op-DDT	µg/g	0.02		< 0.02		
pp-DDT	µg/g	0.02		< 0.02		

Client: Sirati & Partners Consultants Ltd
Project: SP18-334-20
Project Manager: Nazanin Sajdeh
Samplers: Tecle

PACKAGE: **REG153 - Organochlorine Pests (OCs)**
(SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	22
Sample Name	Dup 2
Sample Matrix	Soil
Sample Date	19/10/2018

Organochlorine Pests (OCs) (continued)

Parameter	Units	RL	L1	Result
DDT (total)	µg/g	0.05	1.4	< 0.05
Dieldrin	µg/g	0.05	0.05	< 0.05
gamma-BHC	µg/g	0.01	0.01	< 0.01
Endosulfan I	µg/g	0.02		< 0.02
Endosulfan II	µg/g	0.02		< 0.02
Endrin	µg/g	0.04	0.04	< 0.04
Heptachlor	µg/g	0.01	0.05	< 0.01
Heptachlor epoxide	µg/g	0.01	0.05	< 0.01
Hexachlorobenzene	µg/g	0.01	0.01	< 0.01
Hexachlorobutadiene	µg/g	0.01	0.01	< 0.01
Hexachloroethane	µg/g	0.01	0.01	< 0.01
Methoxychlor	µg/g	0.05	0.05	< 0.05

Client: Sirati & Partners Consultants Ltd

Project: SP18-334-20

Project Manager: Nazanin Sajdeh

Samplers: Tecle

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number			8	11	12	13	14	17	19	20
	Sample Name			BH1-SS1	BH3-SS4	BH4-SS2	BH5-SS3	BH6-SS1	BH7-SS2	BH9-SS3	BH10-SS2
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date			19/10/2018	18/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	19/10/2018	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Other (ORP)											
Mercury	µg/g	0.05	0.27	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Sodium Adsorption Ratio	---	0.2	2.4	< 0.2	< 0.2	< 0.2	0.2	0.3	< 0.2	< 0.2	< 0.2
SAR Calcium	mg/L	0.09		23.9	14.3	39.0	21.1	22.9	69.7	24.4	21.6
SAR Magnesium	mg/L	0.02		2.3	0.43	1.4	1.2	2.9	2.9	0.78	0.90
SAR Sodium	mg/L	0.15		2.8	2.1	1.2	4.1	5.5	1.7	2.3	1.7
Conductivity	mS/cm	0.002	0.57	0.16	0.09	0.08	0.15	0.19	0.10	0.15	0.15
pH	pH Units	0.05		7.89	8.03	8.18	8.00	7.44	8.10	7.84	7.64
Chromium VI	µg/g	0.2	0.66	0.2	< 0.2	< 0.2	< 0.2	0.3	< 0.2	< 0.2	0.3
Free Cyanide	µg/g	0.05	0.051	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Client: Sirati & Partners Consultants Ltd

Project: SP18-334-20

Project Manager: Nazanin Sajdeh

Samplers: Tecle

PACKAGE: **REG153 - Other (ORP)** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	21
Sample Name	DUP 1
Sample Matrix	Soil
Sample Date	19/10/2018

Parameter	Units	RL	L1	Result
Other (ORP)				
Mercury	µg/g	0.05	0.27	< 0.05
Sodium Adsorption Ratio	---	0.2	2.4	< 0.2
SAR Calcium	mg/L	0.09		16.5
SAR Magnesium	mg/L	0.02		1.1
SAR Sodium	mg/L	0.15		1.1
Conductivity	mS/cm	0.002	0.57	0.08
pH	pH Units	0.05		8.14
Chromium VI	µg/g	0.2	0.66	< 0.2
Free Cyanide	µg/g	0.05	0.051	< 0.05

Client: Sirati & Partners Consultants Ltd

Project: SP18-334-20

Project Manager: Nazanin Sajdeh

Samplers: Tecle

PACKAGE: **REG153 - Pesticides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

	Sample Number			8	9	10	13	15	16	18	19
	Sample Name			BH1-SS1	BH2-SS1	BH3-SS3	BH5-SS3	BH6-SS2	BH7-SS1	BH8-SS2	BH9-SS3
	Sample Matrix			Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
	Sample Date			19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	18/10/2018	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Pesticides											
Endosulfan (total)	µg/g	0.04	0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04	< 0.04
Azinphos-methyl	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chlorpyrifos	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Diazinon	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dimethoate	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methyl Parathion	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Malathion	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Parathion	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phorate	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Temephos	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Terbufos	µg/g	0.05		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Client: Sirati & Partners Consultants Ltd
Project: SP18-334-20
Project Manager: Nazanin Sajdeh
Samplers: Tecle

PACKAGE: **REG153 - Pesticides** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

Sample Number	22
Sample Name	Dup 2
Sample Matrix	Soil
Sample Date	19/10/2018

Parameter	Units	RL	L1	Result
Pesticides				
Endosulfan (total)	µg/g	0.04	0.04	< 0.04
Azinphos-methyl	µg/g	0.05		< 0.05
Chlorpyrifos	µg/g	0.05		< 0.05
Diazinon	µg/g	0.05		< 0.05
Dimethoate	µg/g	0.05		< 0.05
Methyl Parathion	µg/g	0.05		< 0.05
Malathion	µg/g	0.05		< 0.05
Parathion	µg/g	0.05		< 0.05
Phorate	µg/g	0.05		< 0.05
Temephos	µg/g	0.05		< 0.05
Terbufos	µg/g	0.05		< 0.05

Client: Sirati & Partners Consultants Ltd
Project: SP18-334-20
Project Manager: Nazanin Sajdeh
Samplers: Tecle

PACKAGE: **REG153 - Pesticides Surrogate** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

				Sample Number	8	9	10	13	15	16	18	19
				Sample Name	BH1-SS1	BH2-SS1	BH3-SS3	BH5-SS3	BH6-SS2	BH7-SS1	BH8-SS2	BH9-SS3
				Sample Matrix	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
				Sample Date	19/10/2018	19/10/2018	18/10/2018	18/10/2018	18/10/2018	19/10/2018	18/10/2018	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**	**Result**
Pesticides Surrogate												
Surr Decachlorobiphenyl	Surr Rec %	-		103	106	93	89	97	98	99	91	

PACKAGE: **REG153 - Pesticides Surrogate** (SOIL)

L1 = REG153 / SOIL / COARSE - TABLE 1 - Residential/Parkland/Industrial - UNDEFINED

				Sample Number	22
				Sample Name	Dup 2
				Sample Matrix	Soil
				Sample Date	19/10/2018
Parameter	**Units**	**RL**	**L1**	**Result**	
Pesticides Surrogate					
Surr Decachlorobiphenyl	Surr Rec %	-		100	

EXCEEDANCE SUMMARY

No exceedances are present above the regulatory limit(s) indicated

HOLDING TIME SUMMARY

Sample Name	QC Batch Reference	Sample Number	Sampled	Received	Extracted/ Prepared	Analysed	Holding Time	Approved
Conductivity								
Method: EPA 6010/SM 2510 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-006								
BH1-SS1	EWL0507-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/29/2018
BH3-SS4	EWL0507-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/29/2018
BH4-SS2	EWL0507-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/29/2018
BH5-SS3	EWL0507-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/29/2018
BH6-SS1	EWL0507-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/29/2018
BH7-SS2	EWL0507-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/29/2018
BH9-SS3	EWL0507-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/29/2018
BH10-SS2	EWL0507-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/29/2018
DUP 1	EWL0507-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/29/2018
Cyanide by SFA								
Method: SM 4500 | Internal ref.: ME-CA-[ENV]SFA-LAK-AN-005								
BH1-SS1	SKA5064-OCT18	8	10/19/2018	10/25/2018	10/25/2018	10/26/2018	11/02/2018	10/29/2018
BH3-SS4	SKA5064-OCT18	11	10/18/2018	10/25/2018	10/25/2018	10/26/2018	11/01/2018	10/29/2018
BH4-SS2	SKA5064-OCT18	12	10/18/2018	10/25/2018	10/25/2018	10/26/2018	11/01/2018	10/29/2018
BH5-SS3	SKA5064-OCT18	13	10/18/2018	10/25/2018	10/25/2018	10/26/2018	11/01/2018	10/29/2018
BH6-SS1	SKA5064-OCT18	14	10/18/2018	10/25/2018	10/25/2018	10/26/2018	11/01/2018	10/29/2018
BH7-SS2	SKA5064-OCT18	17	10/19/2018	10/25/2018	10/25/2018	10/26/2018	11/02/2018	10/29/2018
BH9-SS3	SKA5064-OCT18	19	10/19/2018	10/25/2018	10/25/2018	10/26/2018	11/02/2018	10/29/2018
BH10-SS2	SKA5064-OCT18	20	10/19/2018	10/25/2018	10/25/2018	10/26/2018	11/02/2018	10/29/2018
DUP 1	SKA5064-OCT18	21	10/19/2018	10/25/2018	10/25/2018	10/26/2018	11/02/2018	10/29/2018
Hexavalent Chromium by IC								
Method: EPA218.6/EPA3060A | Internal ref.: ME-CA-[ENV]IC-LAK-AN-008								
BH1-SS1	DIO0523-OCT18	8	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/31/2018
BH3-SS4	DIO0523-OCT18	11	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/31/2018
BH4-SS2	DIO0523-OCT18	12	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/31/2018
BH5-SS3	DIO0523-OCT18	13	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/31/2018
BH6-SS1	DIO0523-OCT18	14	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/31/2018
BH7-SS2	DIO0523-OCT18	17	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/31/2018
BH9-SS3	DIO0523-OCT18	19	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/31/2018
BH10-SS2	DIO0523-OCT18	20	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/31/2018
DUP 1	DIO0523-OCT18	21	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/31/2018
Mercury by CVAAS								
Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-004								
BH1-SS1	EMS0127-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/30/2018
BH3-SS4	EMS0127-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/30/2018
BH4-SS2	EMS0127-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/30/2018
BH5-SS3	EMS0127-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/30/2018

HOLDING TIME SUMMARY

Sample Name	QC Batch Reference	Sample Number	Sampled	Received	Extracted/ Prepared	Analysed	Holding Time	Approved
Mercury by CVAAS (continued)								
Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-004								
BH6-SS1	EMS0127-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	11/15/2018	10/30/2018
BH7-SS2	EMS0127-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/30/2018
BH9-SS3	EMS0127-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/30/2018
BH10-SS2	EMS0127-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/30/2018
DUP 1	EMS0127-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	11/16/2018	10/30/2018
Metals in aqueous samples - ICP-OES								
Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-003								
BH1-SS1	ESG0073-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH3-SS4	ESG0073-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH4-SS2	ESG0073-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH5-SS3	ESG0073-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH6-SS1	ESG0073-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH7-SS2	ESG0073-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH9-SS3	ESG0073-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH10-SS2	ESG0073-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
DUP 1	ESG0073-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
Metals in Soil - Aqua-regia/ICP-MS								
Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENV]SPE-LAK-AN-005								
BH1-SS1	EMS0127-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH3-SS4	EMS0127-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH4-SS2	EMS0127-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH5-SS3	EMS0127-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH6-SS1	EMS0127-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH7-SS2	EMS0127-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH9-SS3	EMS0127-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH10-SS2	EMS0127-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
DUP 1	EMS0127-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
Moisture								
Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010								
BH1-SS1	GCM0456-OCT18	8	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
BH2-SS1	GCM0456-OCT18	9	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
BH3-SS3	GCM0456-OCT18	10	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH3-SS4	GCM0456-OCT18	11	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH4-SS2	GCM0456-OCT18	12	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH5-SS3	GCM0456-OCT18	13	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH6-SS1	GCM0456-OCT18	14	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH6-SS2	GCM0456-OCT18	15	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018

HOLDING TIME SUMMARY

Sample Name	QC Batch Reference	Sample Number	Sampled	Received	Extracted/ Prepared	Analysed	Holding Time	Approved
Moisture (continued)								
Method: CCME Tier 1 | Internal ref.: ME-CA-[ENV]GC-LAK-AN-010								
BH7-SS1	GCM0456-OCT18	16	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
BH7-SS2	GCM0456-OCT18	17	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
BH8-SS2	GCM0456-OCT18	18	10/18/2018	10/25/2018	10/26/2018	10/27/2018	12/17/2018	10/29/2018
BH9-SS3	GCM0456-OCT18	19	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
BH10-SS2	GCM0456-OCT18	20	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
DUP 1	GCM0456-OCT18	21	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
Dup 2	GCM0456-OCT18	22	10/19/2018	10/25/2018	10/26/2018	10/27/2018	12/18/2018	10/29/2018
Pesticides								
Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-018								
BH1-SS1	GCM0477-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/31/2018
BH2-SS1	GCM0477-OCT18	9	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/31/2018
BH3-SS3	GCM0477-OCT18	10	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/31/2018
BH5-SS3	GCM0477-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/31/2018
BH6-SS2	GCM0477-OCT18	15	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/31/2018
BH7-SS1	GCM0477-OCT18	16	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/31/2018
BH8-SS2	GCM0477-OCT18	18	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/31/2018
BH9-SS3	GCM0477-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/31/2018
Dup 2	GCM0477-OCT18	22	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/31/2018
pH								
Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-001								
BH1-SS1	ARD0090-OCT18	8	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/30/2018
BH3-SS4	ARD0090-OCT18	11	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/30/2018
BH4-SS2	ARD0090-OCT18	12	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/30/2018
BH5-SS3	ARD0090-OCT18	13	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/30/2018
BH6-SS1	ARD0090-OCT18	14	10/18/2018	10/25/2018	10/30/2018	10/30/2018	11/17/2018	10/30/2018
BH7-SS2	ARD0090-OCT18	17	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/30/2018
BH9-SS3	ARD0090-OCT18	19	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/30/2018
BH10-SS2	ARD0090-OCT18	20	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/30/2018
DUP 1	ARD0090-OCT18	21	10/19/2018	10/25/2018	10/30/2018	10/30/2018	11/18/2018	10/30/2018
Sodium adsorption ratio (SAR)								
Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-021								
BH1-SS1	ESG0073-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH3-SS4	ESG0073-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH4-SS2	ESG0073-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH5-SS3	ESG0073-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH6-SS1	ESG0073-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	04/16/2019	10/30/2018
BH7-SS2	ESG0073-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018

HOLDING TIME SUMMARY

Sample Name	QC Batch Reference	Sample Number	Sampled	Received	Extracted/ Prepared	Analysed	Holding Time	Approved
Sodium adsorption ratio (SAR) (continued)								
Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-[ENV]ARD-LAK-AN-021								
BH9-SS3	ESG0073-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
BH10-SS2	ESG0073-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
DUP 1	ESG0073-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	04/17/2019	10/30/2018
Water Soluble Boron								
Method: O.Reg. 153/04 | Internal ref.: ME-CA-[ENV] SPE-LAK-AN-003								
BH1-SS1	ESG0066-OCT18	8	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/30/2018
BH3-SS4	ESG0066-OCT18	11	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/30/2018
BH4-SS2	ESG0066-OCT18	12	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/30/2018
BH5-SS3	ESG0066-OCT18	13	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/30/2018
BH6-SS1	ESG0066-OCT18	14	10/18/2018	10/25/2018	10/29/2018	10/29/2018	12/17/2018	10/30/2018
BH7-SS2	ESG0066-OCT18	17	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/30/2018
BH9-SS3	ESG0066-OCT18	19	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/30/2018
BH10-SS2	ESG0066-OCT18	20	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/30/2018
DUP 1	ESG0066-OCT18	21	10/19/2018	10/25/2018	10/29/2018	10/29/2018	12/18/2018	10/30/2018

QC SUMMARY

Conductivity

Method: EPA 6010/SM 2510 I Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0507-OCT18	mS/cm	0.002	<0.002	0	10	99	90	110	NA		

Cyanide by SFA

Method: SM 4500 I Internal ref.: ME-CA-IENVISFA-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Free Cyanide	SKA5064-OCT18	µg/g	0.05	< 0.05	ND	20	100	80	120	93	75	125

Hexavalent Chromium by IC

Method: EPA218.6/EPA3060A I Internal ref.: ME-CA-IENVIIC-LAK-AN-008

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium VI	DIO0523-OCT18	µg/g	0.2	<0.2	12	20	99	80	120	102	75	125

QC SUMMARY

Mercury by CVAAS

Method: EPA 7471A/EPA 245 | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury	EMS0127-OCT18	µg/g	0.05	<0.05	ND	20	110	80	120	102	70	130

Metals in aqueous samples - ICP-OES

Method: MOE 4696e01/EPA 6010 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
SAR Calcium	ESG0073-OCT18	mg/L	0.09	<0.09	6	20	103	80	120	94	70	130
SAR Magnesium	ESG0073-OCT18	mg/L	0.02	<0.02	7	20	98	80	120	94	70	130
SAR Sodium	ESG0073-OCT18	mg/L	0.15	<0.15	ND	20	97	80	120	96	70	130

QC SUMMARY

Metals in Soil - Aqua-regia/ICP-MS

Method: EPA 3050/EPA 200.8 | Internal ref.: ME-CA-[ENVISPE-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver	EMS0127-OCT18	ug/g	0.05	<0.05	13	20	93	70	130	100	70	130
Arsenic	EMS0127-OCT18	µg/g	0.5	<0.5	3	20	93	70	130	98	70	130
Barium	EMS0127-OCT18	ug/g	0.1	<0.1	2	20	98	70	130	96	70	130
Beryllium	EMS0127-OCT18	µg/g	0.02	<0.02	2	20	91	70	130	92	70	130
Boron	EMS0127-OCT18	µg/g	1	<1	1	20	107	70	130	94	70	130
Cadmium	EMS0127-OCT18	µg/g	0.02	<0.02	ND	20	94	70	130	99	70	130
Cobalt	EMS0127-OCT18	µg/g	0.01	<0.01	3	20	95	70	130	104	70	130
Chromium	EMS0127-OCT18	µg/g	0.5	<0.5	3	20	96	70	130	103	70	130
Copper	EMS0127-OCT18	µg/g	0.1	<0.1	6	20	91	70	130	96	70	130
Molybdenum	EMS0127-OCT18	µg/g	0.1	<0.1	19	20	92	70	130	102	70	130
Nickel	EMS0127-OCT18	ug/g	0.5	<0.5	3	20	91	70	130	98	70	130
Lead	EMS0127-OCT18	µg/g	0.1	<0.1	1	20	97	70	130	101	70	130
Antimony	EMS0127-OCT18	µg/g	0.8	<0.8	ND	20	99	70	130	101	70	130
Selenium	EMS0127-OCT18	µg/g	0.7	<0.7	ND	20	94	70	130	98	70	130
Thallium	EMS0127-OCT18	µg/g	0.02	<0.02	3	20	98	70	130	106	70	130
Uranium	EMS0127-OCT18	µg/g	0.002	<0.002	18	20	109	70	130	97	70	130
Vanadium	EMS0127-OCT18	µg/g	3	<3	3	20	95	70	130	100	70	130
Zinc	EMS0127-OCT18	µg/g	0.7	<0.7	5	20	94	70	130	97	70	130

QC SUMMARY

Pesticides

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENVIGC-LAK-AN-018

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Aldrin	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	84	50	140	87	50	140
alpha-Chlordane	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	88	50	140	94	50	140
Azinphos-methyl	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	72	50	140	130	50	140
Chlorpyrifos	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	85	50	140	92	50	140
Diazinon	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	83	50	140	91	50	140
Dieldrin	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	85	50	140	93	50	140
Dimethoate	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	80	50	140	95	50	140
Endosulfan I	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	91	50	140	98	50	140
Endosulfan II	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	85	50	140	89	50	140
Endrin	GCM0477-OCT18	µg/g	0.04	< 0.04	ND	40	87	50	140	104	50	140
gamma-BHC	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	91	50	140	90	50	140
gamma-Chlordane	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	91	50	140	95	50	140
Heptachlor epoxide	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	88	50	140	92	50	140
Heptachlor	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	87	50	140	87	50	140
Hexachlorobenzene	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	131	50	140	130	50	140
Hexachlorobutadiene	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	90	50	140	89	50	140
Hexachloroethane	GCM0477-OCT18	µg/g	0.01	< 0.01	ND	40	88	50	140	85	50	140
Malathion	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	84	50	140	103	50	140
Methoxychlor	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	81	50	140	75	50	140
Methyl Parathion	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	79	50	140	97	50	140

QC SUMMARY

Pesticides (continued)

Method: EPA 3541/8270D | Internal ref.: ME-CA-[ENV]GC-LAK-AN-018

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
o,p-DDD	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	86	50	140	104	50	140
o,p-DDE	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	92	50	140	98	50	140
op-DDT	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	83	50	140	72	50	140
Parathion	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	73	50	140	96	50	140
Phorate	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	88	50	140	93	50	140
pp-DDD	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	80	50	140	106	50	140
pp-DDE	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	90	50	140	97	50	140
pp-DDT	GCM0477-OCT18	µg/g	0.02	< 0.02	ND	40	79	50	140	63	50	140
Temephos	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	81	50	140	76	50	140
Terbufos	GCM0477-OCT18	µg/g	0.05	< 0.05	ND	40	82	50	140	90	50	140

pH

Method: SM 4500 | Internal ref.: ME-CA-[ENV]EWL-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	ARD0090-OCT18	pH Units	0.05		0	20	100	80	120			

QC SUMMARY

Water Soluble Boron

Method: O.Reg. 153/04 | Internal ref.: ME-CA-IENVI SPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Water Soluble Boron	ESG0066-OCT18	µg/g	0.5	<0.5	ND	20	96	80	120	109	70	130

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates 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.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS	Insufficient sample for analysis.
RL	Reporting Limit.
↑	Reporting limit raised.
↓	Reporting limit lowered.
NA	The sample was not analysed for this analyte
ND	Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

-- End of Analytical Report --

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No:

Page 1 of 2

Laboratory Information Section - Lab use only

Received By: Ismaj
Received Date (mm/dd/yy): 10-25-18
Received Time: 1050
Received By (signature):
Custody Seal Present: ☒
Custody Seal Intact: ☒
Cooling Agent Present: ☑
Temperature Upon Receipt (°C) 7,6,4x3
LAB LIMS #: CA14589 Oct 18

REPORT INFORMATION

Company: Sirati and Partners
Contact: NAZANIN SAJDEH
Address: 12700 Keele Street, King City, ON L7B 1H5
Phone: 905 833 1582
Email: nazanin@sirati.ca
Email: Giorgio@sirati.ca

INVOICE INFORMATION

☐ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

PROJECT INFORMATION

Quotation #: 2018 MSA
P.O. #:
Project #: SP18-334-20
Site Location/ID:

TURNAROUND TIME (TAT) REQUIRED

☑ Regular TAT (5-7days)

TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

RUSH TAT (Additional Charges May Apply): ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days

PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:
Rush Confirmation ID:

REGULATIONS

Regulation 153/04: ☑ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ R/P/I ☐ I/C/C ☐ A/O
Soil Texture: ☒ Coarse ☐ Medium ☐ Fine

Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm
Municipality:

RECORD OF SITE CONDITION (RSC) ☒ YES ☐ NO

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	Metals & Inorganics	PAH ☐ ABN ☐ SVOC(all) ☐	PCB Total ☐ Aroclor ☐	PHC F1-F4 ☐ VOC ☐ BTEX ☐ BTEX/F1 ☐ F2-F4 ☐	VOC ☐ BTEX ☐ THM ☐	Pesticides OC ☐ OP ☐	TCLP M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit. ☐	Water Pkg Gen. ☐ Ext. ☐	Sewer Use:						COMMENTS:
1	BH1-SS1	Oct 19, 2018		2	Soil		☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
2	BH2-SS1	Oct 19,2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
3	BH3-SS3	Oct 18, 2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
4	BH3-SS4	Oct 18, 2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
5	BH4-SS2	Oct 18, 2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
6	BH5-SS3	Oct 18, 2018		2	Soil		☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
7	BH6-SS1	Oct 18, 2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
8	BH6-SS2	Oct 18, 2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
9	BH7-SS1	Oct 19, 2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
10	BH7-SS2	Oct 19, 2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	
11	BH8-SS2	Oct 18, 2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	
12	BH9-SS3	Oct 19, 2018		2	Soil		☑	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐	☐	☐	☐	

Observations/Comments/Special Instructions

Sampled By (NAME): Teale	**Signature:**	Date: Oct 24, 2018 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	**Signature:**	Date: (mm/dd/yy)	Yellow & White Copy - SGS

Revision #: 1.1
Date of Issue: 04 April, 2018

Request for Laboratory Services and CHAIN OF CUSTODY

SGS Environment, Health & Safety - Lakefield: 185 Concession St., Lakefield, ON K0L 2H0 Phone: 705-652-2000 Fax: 705-652-6365 Web: www.sgs.com/environment
- London: 657 Consortium Court, London, ON, N6E 2S8 Phone: 519-672-4500 Toll Free: 877-848-8060 Fax: 519-672-0361

No:

Laboratory Information Section - Lab use only

Received By: Ismail
Received Date (mm/dd/yy): 10-25-18
Received Time: 1052
Received By (signature):
Custody Seal Present: ☑
Custody Seal Intact: ☑
Cooling Agent Present: ☑
Temperature Upon Receipt (°C):
LAB LIMS #: CA14589oct18

REPORT INFORMATION

Company: Sirati and Partners
Contact: NAZANIN SAJDEH
Address: 12700 Keele Street, King City, ON L7B 1H5
Phone: 905 833 1582
Email: nazanin@sirati.ca
Email: Giorgio@sirati.ca

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☐ (same as Report Information)
Company:
Contact:
Address:
Phone:
Email:

PROJECT INFORMATION

Quotation #: 2018 MSA
P.O. #:
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TAT's are quoted in business days (exclude statutory holidays & weekends). Samples received after 6pm or on weekends: TAT begins next business day

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PLEASE CONFIRM RUSH FEASIBILITY WITH SGS REPRESENTATIVE PRIOR TO SUBMISSION

Specify Due Date:
Rush Confirmation ID:

REGULATIONS

Regulation 153/04: ☑ Table 1 ☐ Table 2 ☐ Table 3 ☐ Table ____ ☐ R/P/I ☐ I/C/C ☐ A/O
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Other Regulations: ☐ Reg 347/558 (3 Day min TAT) ☐ PWQO ☐ MMER ☐ CCME ☐ Other: ☐ MISA

Sewer By-Law: ☐ Sanitary ☐ Storm Municipality:

NOTE: DRINKING (POTABLE) WATER SAMPLES FOR HUMAN CONSUMPTION MUST BE SUBMITTED WITH SGS DRINKING WATER CHAIN OF CUSTODY

RECORD OF SITE CONDITION (RSC) ☒ YES ☐ NO

ANALYSIS REQUESTED

	SAMPLE IDENTIFICATION	DATE SAMPLED	TIME SAMPLED	# OF BOTTLES	MATRIX	Field Filtered (Y/N)	Metals & Inorganics	PAH ☐ ABN ☐ SVOC(all) ☐	PCB Total ☐ Aroclor ☐	PHC F1-F4 ☐ BTEX ☐ VOC ☐ BTEX/F1 ☐ F2-F4 ☐	VOC ☐ BTEX ☐ THM ☐	Pesticides OC ☐ OP ☑	TCLP M&I ☐ VOC ☐ PCB ☐ B(a)P ☐ ABN ☐ Ignit. ☐	Water Pkg Gen. ☐ Ext. ☐	Sewer Use:						COMMENTS:
1	BH10-SS2	Oct 19, 2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐						
2	DUP 1	Oct 19,2018		1	Soil		☑	☐	☐	☐	☐	☐	☐	☐	☐						
3	Dup 2	Oct 19, 2018		1	Soil		☐	☐	☐	☐	☐	☑	☐	☐	☐						
4							☐	☐	☐	☐	☐	☐	☐	☐	☐						
5							☐	☐	☐	☐	☐	☐	☐	☐	☐						
6							☐	☐	☐	☐	☐	☐	☐	☐	☐						
7							☐	☐	☐	☐	☐	☐	☐	☐	☐						
8							☐	☐	☐	☐	☐	☐	☐	☐	☐						
9							☐	☐	☐	☐	☐	☐	☐	☐	☐						
10							☐	☐	☐	☐	☐	☐	☐	☐	☐						
11							☐	☐	☐	☐	☐	☐	☐	☐	☐						
12							☐	☐	☐	☐	☐	☐	☐	☐	☐						

Observations/Comments/Special Instructions

Sampled By (NAME): Tecle	**Signature:**	Date: Oct 24 2018 (mm/dd/yy)	Pink Copy - Client
Relinquished by (NAME):	**Signature:**	Date: (mm/dd/yy)	Yellow & White Copy - SGS

SGS

SAMPLE INTEGRITY REPORT

Project Number: Sp18_334_20

ONTARIO REGULATION 153/04

SGS Sample ID CA14589oct18

Date / Time Sampled Oct18 2018

Client Sample ID See CofC

	ALL
Sample Submission General Sample Integrity Violations	
Temperature >10 C upon receipt if not sampled same day	☐
No evidence of cooling trend initiated if sampled same day	☐
Chain of Custody not submitted	☐
Chain of Custody incomplete	☐
Chain of Custody not signed / dated	☐
Chain of Custody not a current version	☐
Bottles / Samples listed on CoC but not received	☐
Bottles / Samples received but not listed on the CoC	☐
Sample container received empty	☐

Sample Specific Sample Integrity Violations							
Sample received past hold time	☐	☐	☐	☐	☐	☐	☐
Incorrect preservation (including no preservation where required)	☐	☐	☐	☐	☐	☐	☐
Headspace present in VOC vial (aqueous)	☐	☐	☐	☐	☐	☐	☐
Sample(s) received frozen	☐	☐	☐	☐	☐	☐	☐
Bottle(s) broken or damaged in transport	☐	☐	☐	☐	☐	☐	☐
Discrepancy between sample label and chain of custody	☐	☐	☐	☐	☐	☐	☐
Analysis requirements absent / unclear	☐	☐	☐	☐	☐	☐	☐
Missing or incorrect sample label(s)	☐	☐	☐	☐	☐	☐	☐
Inappropriate sample container used	☐	☐	☐	☐	☐	☐	☐
Insufficient number of bottles received	☐	☐	☐	☐	☐	☐	☐
Limited sample volume	☐	☐	☐	☐	☐	☐	☐
Insufficient sample volume	☐	☐	☐	☐	☐	☐	☐
Sample contains multiple phases	☐	☐	☐	☐	☐	☐	☐
Sediment Log							
Groundwater samples contain visible sediment / particulate	☐	☐	☐	☐	☐	☐	☐
Groundwater contains greater than 1cm of sediment / particulate matter in bottle	☐	☐	☐	☐	☐	☐	☐

Additional Comments/Remarks:

No issues upon receipt ☑ Initials: KM

APPENDIX D

SIRATI & PARTNERS

Geotechnical Hydrogeological & Environmental Solutions

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE MAY 2, 2018

LAURENCE J. KUKLING
ONTARIO LAND SURVEYOR

PLAN 43R-

RECEIVED AND DEPOSITED

DATE _____

_____
REPRESENTATIVE FOR THE LAND REGISTRAR FOR THE LAND TITLES DIVISION OF PEEL (No 43)

SCHEDULE

PART	LOT	CONCESSION	PIN	AREA sq m.	REMARKS
1	PART WEST HALF OF 28	8	ALL 14341-0040	412104.24	

PLAN OF SURVEY OF
PART OF LOT 28 CONCESSION 8
GEOGRAPHIC TOWNSHIP OF ALBION
NOW IN THE
TOWN OF CALEDON
REGIONAL MUNICIPALITY OF PEEL
SCALE 1 : 1500

0 25 50 75metres

GUIDO PAPA SURVEYING
A DIVISION OF J.D. BARNES LIMITED

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

NOTES

BEARINGS ARE UTM GRID, DERIVED FROM OBSERVED REFERENCE POINTS A AND B, BY REAL TIME NETWORK (RTN) OBSERVATIONS, UTM ZONE 17, NAD83 (CSRS) (2010.0).

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.999667.

FOR BEARING COMPARISONS ASTRONOMIC BEARINGS WERE ROTATED ON PLANS AS FOLLOWS	
PLAN	ROTATION
43M-1265	1°41'20" CCW
43M-1576, 43R-19488	0°49'20" CCW
PLAN OF SURVEY BY C.A.SEXTON DATED SEPT. 2, 1987 JOB NO. 87-5228-3	1°41'29" CCW
SKETCH SHOWING LOTS 29 & 30 CONCESSION 8, TOWN SHIP OF ALBION COUNTY OF PEEL BY J.R. SNEATH PL. REF.NO. 66127, DATED DEC. 4, 1966 AND SOPP OF PART OF LOT 29 CONCESSION 8 BY RICHARD A.PREISS DATED MAY 15, 2000, JOB NO. 00-3322	0°44'20" CCW

INTEGRATION DATA

OBSERVED REFERENCE POINTS (ORPs): UTM ZONE 17, NAD83 (CSRS) (2010.0).

COORDINATES TO URBAN ACCURACY PER SECTION 14 (2) OF O.REG 216/10.

POINT ID	EASTING	NORTHING
ORP (A)	593 270.38	4 869 055.19
ORP (B)	593 679.93	4 869 590.26
ORP (C)	594 125.17	4 869 165.28

COORDINATES CANNOT, IN THEMSELVES, BE USED TO RE-ESTABLISH CORNERS OR BOUNDARIES SHOWN ON THIS PLAN.

LEGEND

■	DENOTES	SURVEY MONUMENT FOUND
□	DENOTES	SURVEY MONUMENT SET
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
IB	DENOTES	IRON BAR
PB	DENOTES	PLASTIC BAR
WIT	DENOTES	WITNESS
MEAS	DENOTES	MEASURED
P	DENOTES	SKETCH BY J.R. SNEATH O.L.S. DATED DECEMBER 4, 1966, REF. NO. 66127
P2	DENOTES	PLAN OF SURVEY BY ROBERT BASIL LEE LTD. DATED DECEMBER 19, 1984, REF. NO.87884
P3	DENOTES	PLAN OF SURVEY BY C.A.SEXTON O.L.S. DATED SEPTEMBER 2, 1987, JOB NO. 87-5228-3
P4	DENOTES	REGISTERED PLAN 43M-1576
P5	DENOTES	REGISTERED PLAN 43M-1265
P6	DENOTES	PLAN 43R-19488
P7	DENOTES	SURVEYOR'S REAL PROPERTY REPORT BY RICHARD A. PREISS O.L.S. DATED MAY 15, 2000, JOB NO. 00-3322
CS	DENOTES	C.A. SEXTON O.L.S.
YY	DENOTES	YOUNG & YOUNG O.L.S.
RBL	DENOTES	ROBERT BASIL LEE O.L.S.
927	DENOTES	J.R.SNEATH O.L.S.
1539	DENOTES	RICHARD A. PREISS O.L.S.
760	DENOTES	KENNETH HARVEY McCONNELL O.L.S.
P&WF	DENOTES	POST & WIRE FENCE O.L.S.
CCW	DENOTES	COUNTER CLOCKWIZE
AKA	DENOTES	ALSO KNOWN AS

ALL DIMENSIONS SHOWN BETWEEN SURVEY MONUMENTS FOUND ARE MEASURED SAVE AND EXCEPT COMPARISONS TO EXISTING PLANS, SURVEY AND DEEDS.

ALL SET SSIB AND PB MONUMENTS WERE USED DUE TO LACK OF OVERBURDEN AND/OR PROXIMITY OF UNDERGROUND UTILITIES IN ACCORDANCE WITH SECTION 11 (4) OF O.REG. 525/91.

SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON APRIL 19, 2018

MAY 2, 2018
DATE

LAURENCE J. KUKLING
ONTARIO LAND SURVEYOR

GUIDO PAPA SURVEYING
A Division of J.D. Barnes Limited
SURVEYING MAPPING GIS
216 CHRISLEA RD, WOODBRIDGE, ON L4L 8S5
T: (905) 264-2727 F: (905) 264-2728 www.jdbarnes.com

DRAWN BY:	CHECKED BY:	REFERENCE NO.:
EK/LJK	L.J.K.	18-18-975-00-REF

FILE: G:\Jobs\2018\18-18-975-00 17791 Mount Hope Road\00\R-Plan\18-18-975-00-RP.dgn