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Phase II Environmental Site Assessment

7000 Campeau Drive
Ottawa, Ontario

Prepared For
ClubLink Corporation ULC

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Report: PE4321-2 Rev 2

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EXECUTIVE SUMMARY

Assessment

A Phase II ESA was conducted for the property addressed 7000 Campeau Drive, herein referred to as the Phase II Property, in the City of Ottawa, Ontario. It should be noted that the Phase II Property is comprised of four (4) parcels of land identified as Parcels 1 through 4 for the purposes of this report.

The purpose of the Phase II ESA was to assess the soil and groundwater quality on or beneath the Phase II Property, within areas of potential environmental concern (APECs) identified during the Phase I ESA carried out by Paterson and dated December 2018. An initial Phase II ESA field program was carried out in 2019, with a supplemental field program carried out in 2020. The findings of both field programs constitute the Phase II ESA and are presented in this updated Phase II ESA report.

2019 Investigation

The 2019 Phase II ESA field program was carried out in conjunction with a Geotechnical Investigation and consisted of drilling 20 boreholes across the Phase II Property, 13 of which were constructed with groundwater monitoring well installations, and the placement of 20 shallow hand auger holes. Approximately 190 probeholes were also completed as part of the Geotechnical Investigation, in order to confirm bedrock depth in areas of deep overburden.

Soil samples obtained from the boreholes and auger holes were screened primarily using visual observations. Samples collected from within the vicinity of the Turf Building and aboveground storage tanks (ASTs) were also screened using combustible vapour measurements. Based on the screening results in combination with sample depth and location, a total of 27 soil samples, including a duplicate sample, were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4), metals and/or organochlorine pesticides (OCPs).

Based on the analytical test results, no BTEX parameters or PHC (F1) were identified in the soil samples submitted for testing. Petroleum hydrocarbon F2, F3 and/or F4 fractions were identified in shallow auger flight samples recovered from BH2, BH3 and BH5, within the vicinity of the ASTs and Turf Building on the southeastern portion of the Phase II Property (Parcel 1). Metals parameters were also identified in the fill material on this portion of the Phase II Property, while no OCPs were detected in the sample recovered from BH3. The PHC and metal parameters identified were in compliance with the MECP Table 3 standards, selected based on the site conditions within Parcel 1.

Metal and OCP analyses were conducted on shallow soil samples collected from the greens, fairways and/or roughs across the Phase II Property. Concentrations of δ-BHC ranging from 0.01 to 0.03µg/g were identified in shallow soil Samples HA3-G1, HA11-G1 and HA15-G1. Otherwise, no OCP pesticides were identified in any of the samples analysed.

Metal parameters were identified in all samples analysed. Concentrations of mercury identified in the soil recovered from HA14 and HA15 on the northeastern portion of the Phase II Property (Parcel 3) exceeded the MECP Table 7 standards selected for this portion of the site. The remaining metal parameters identified on the Phase II Property at the time of the 2019 field program, were in compliance with the MECP Table 3 or MECP Table 7 standards.

Groundwater samples from monitoring wells installed in BH2, BH3, BH8, BH11, BH13, BH17 and BH20 were recovered and analysed for BTEX, PHCs, OCPs and/or mercury. No free-phase product was observed on the groundwater at any of the monitoring well locations during the February, April and May 2019 sampling events. Based on analytical test results, no BTEX, PHC or mercury concentrations were identified above the laboratory method detection limits in the groundwater samples analysed. No OCP parameters were detected above the laboratory method detection limits, with the exception of hexachlorobutadiene concentrations in groundwater samples recovered from BH8 and BH11 on Parcels 1 and 2 of the Phase II Property. The identified concentrations were in compliance with the MECP Table 3 standards.

2020 Supplemental Investigation

In May of 2020, 34 additional shallow hand auger holes were placed across the Phase II Property to provide additional coverage of the greens, tees and/or fairways, and to delineate previously identified mercury impacts on Parcel 3. A total of 65 shallow soil samples were collected from depths of 0.05 to 0.15m and 0.15m to 0.30m with deeper samples (0.30 to 0.60m) collected at the locations of the original (2019) mercury exceedances.

Soil samples were submitted for analytical testing of mercury and/or organochlorine pesticides. Concentrations of δ-BHC ranging from 0.021µg/g to 0.097µ/g, were identified in each of the samples analysed. Otherwise, no OCP pesticides were identified in any of the samples analysed.

Based on the findings of the analytical testing, mercury concentrations exceeding the selected MECP standards were identified on each Parcel of land comprising the golf course. The mercury concentrations are considered to be present in pockets across the course and are considered to be confined to the upper 0.3 to 0.6m of soil.

On May 5, 2020, groundwater samples from monitoring wells installed in BH8, BH15, BH16, BH18, BH19 and BH20 were recovered and submitted for analytical testing of metals (including As, Sb, Se) and mercury or OCPs. No visual or olfactory indications of potential contamination were observed on the groundwater at any of the monitoring well locations. Based on analytical test results, no OCP or mercury concentrations were identified above the laboratory method detection limits in the groundwater samples analysed. Metal parameters identified in the groundwater samples were in compliance with the selected MECP standards.

Conclusion

Based on the findings of the Phase II ESA, mercury concentrations exceeding the MECP Table 7 and Table 3 standard of 0.27 µg/g were identified in shallow soil samples collected from various locations across the Phase II Property. The mercury is considered to be present in pockets across the site, within the shallow soils, to a maximum depth of approximately 0.6m below grade. Otherwise the soil on and beneath the Phase II Property is in compliance with the selected MECP standards. Groundwater beneath the Phase II Property is in compliance with the applicable MECP standards.

The presence of impacted shallow soils is not considered to represent a concern to the continued use of the site as a golf course. It is recommended that a soil remediation program be carried out at the Phase II Property in conjunction with the redevelopment of the site.

It is expected that the groundwater monitoring wells will be abandoned in accordance with Ontario Regulation 903 at the time of construction excavation. Until this time, it is recommended that they remain in place for possible future groundwater monitoring events.

1.0 INTRODUCTION

At the request of ClubLink Corporation ULC (ClubLink), Paterson Group (Paterson) conducted a Phase II Environmental Site Assessment (ESA) for the property addressed 7000 Campeau Drive in the City of Ottawa, Ontario. The purpose of this Phase II ESA was to address areas of potential environmental concern (APECs) identified in the Phase I ESA conducted by Paterson, dated December 2018.

1.1 Site Description

Address:	7000 Campeau Drive, Ottawa, Ontario.
Legal Description:	Part of Lots 5 and 6, Concession 3, in the City of Ottawa.
Property Identification Numbers:	04511-0214, 04512-1126 and 04513-0489
Location:	The subject site is located on the north side of Campeau Drive, east of Kanata Avenue. The subject site is shown on Figure 1 - Key Plan following the body of this report.
Latitude and Longitude:	45° 19' 17" N, 75° 34' 39" W
Configuration:	Irregular
Site Area:	71 ha (approximate)

1.2 Property Ownership

The subject property is currently owned by ClubLink. Paterson was retained to complete this Phase II ESA by Mr. Andrew Tamlin, CFO of ClubLink. Mr. Tamlin can be contacted by telephone at 905-841-5372.

1.3 Current and Proposed Future Uses

The Phase II Property is currently occupied by the Kanata Golf and Country Club. It is our understanding that the Phase II Property is proposed to be developed with a residential subdivision consisting of residential dwellings, storm water management ponds, open space and parkland.

A record of site condition is required for the more sensitive land use change from commercial to residential. As the Phase II Property is non-contiguous, an RSC will be required for each of the 4 parcels of land.

1.4 Applicable Site Condition Standard

The site condition standards for the property were obtained from Table 3 and Table 7 of the document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by the Ontario Ministry of the Environment, Conservation and Parks (MECP), April 2011.

As noted in the previous section, the Phase II Property is comprised of 4 non-contiguous parcels of land; each parcel of land is therefore subject to its own site standards given the specific site conditions. The selected MECP Table 3 Standards for Parcels 1 and 2 are based on the following considerations:

- Coarse-grained soil conditions;
- Non-potable groundwater conditions; and
- Residential land use.

The MECP Table 7 standards selected for Parcels 3 and 4 are based on the following considerations:

- Shallow soil (less than 2m of soil cover is present over more than one third of the site);
- Coarse-grained soil conditions;
- Non-potable groundwater conditions; and
- Residential land use.

Non-potable groundwater conditions were selected as the Phase II Property is situated in a municipally serviced area and residential land use standards were selected based on the proposed development.

Grain size-analyses were conducted at four (4) different locations across the Phase II Property, identifying the soil as fine-grained. However, due to the size of the Phase II Property, additional grain-size analysis would be recommended to confirm that fine-grained standards are applicable. The more stringent coarse-grained standards have therefore been selected at this time.

Section 41 of O.Reg. 153/04 does not apply to the Phase II Property, as the property is not within 30m of an environmentally sensitive area and the pH of the soil is between 5 and 9.

Section 43.1 of O.Reg. 153/04 does apply to Blocks 3 and 4 of the Phase II Property as these parcels of land are shallow soil properties.

2.0 BACKGROUND INFORMATION

2.1 Physical Setting

The Phase II Property is situated in an urban setting, surrounded by residential subdivisions and/or apartment buildings, with some treed land to the south. The golf cart storage, Clubhouse and associated parking lot are present on the southwestern portion of the site while the southeastern portion of the site is developed with a maintenance building (the Turf Building). The remainder of the site is occupied by paved walking paths, grassed fairways, landscaped roughs and sand pits. Two man-made ponds are present on the south-central portion of the Phase II Property.

Site topography is generally undulating, with an overall gentle downward slope to the north. Site drainage consists primarily of sheet flow to catch basins in the paved areas, with surficial infiltration and some sheet flow to the aforementioned ponds in the landscaped areas.

The Phase II Property and surrounding properties are currently provided with municipal services and do not have private potable wells or septic systems.

2.2 Past Investigations

Phase I Environmental Site Assessment, 2018

Paterson was retained by ClubLink to carry out a Phase I-Environmental Site Assessment (ESA) for the property addressed 7000 Campeau Drive in the City of Ottawa, Ontario. The purpose of the Phase I-ESA was to research the past and current use of the site and study area and to identify environmental concerns with the potential to have impacted the subject property.

Based on the available historical information sources, the Phase I Property was originally vacant, undeveloped land, possibly used for agricultural purposes, until developed with a 9-hole golf course and Clubhouse during the interim of 1965 through 1968. Nine (9) additional fairways were added to the course at some time between 1976 and 1990. The existing Clubhouse, golf-cart charging station/storage building and maintenance building were reportedly constructed in the early 1990's.

The adjacent and neighbouring properties were historically vacant, undeveloped or agricultural lands. Residential subdivisions were developed around and immediately east of the golf course from the 1970's through the 1990's. No historical off-site PCAs were identified within the Phase I Study Area.

Following the historical review, a site visit was conducted. Based on the findings of the site visit, on-site PCAs include fuel stored in 2 aboveground storage tanks (ASTs) and the storage and application of pesticides and herbicides. These PCAs have resulted in areas of potential environmental concern (APECs) on the Phase I Property as presented in Table 1: Areas of Potential Environmental Concern in the Tables Section following the body of the report. At the time of the site visit, the current uses of the adjacent and neighbouring properties within the Phase I ESA Study Area were observed from publicly accessible areas. No off-site PCAs were identified within the Phase I Study Area at the time of the site visit.

Based on the findings of the Phase I-ESA, a Phase II-ESA was recommended for the Phase I Property.

Geotechnical Investigations, 2018, 2019 and 2020

Based on the findings of the Geotechnical Investigations, the site is suitable for a residential development from a geotechnical perspective. The site stratigraphy was observed to generally consist of a thin layer of topsoil over a native silty clay deposit, generally underlain by glacial till.

Where fill was identified at the borehole locations, the material consisted of reworked native material. Bedrock outcrops and shallow bedrock was observed at several locations over the site. The overburden thickness was anticipated to vary between 0 and 20m.

3.0 SCOPE OF INVESTIGATION

3.1 Overview of Site Investigation

The subsurface investigation was conducted during the interim of February 27 through April 30, 2019, in conjunction with a Geotechnical Investigation. The field program consisted of drilling 20 boreholes to depths ranging from approximately 0.99 to 9.78m below grade. Boreholes BH2-19, BH3-19, BH8-19, BH10-19, BH11-19, BH12-19, BH13-19, BH15-19, BH16-19, BH17-19, BH18-19, BH19-19 and BH20-19 were completed with monitoring well installations.

Bedrock was cored at BH2-19, BH3-19 and BH17-19 through BH20-19 for the purpose of intercepting the groundwater table. The field program also consisted of the placement of 20 hand auger holes across the Phase II Property, to obtain near surface soil samples.

A supplemental field investigation was carried out on May 4, 2020, at which time an additional 34 hand auger holes were placed across the Phase II Property. The purpose of the supplemental sampling was to delineate mercury exceedances previously identified in the shallow soils on Parcel 3, and to provide additional coverage of the greens and fairways.

3.2 Media Investigated

During the subsurface investigation, soil samples and groundwater samples were obtained and submitted for laboratory analysis. The rationale for sampling and analyzing these media is based on the Contaminants of Potential Concern (CPCs) identified in the Phase I ESA. The CPCs for soil and groundwater include petroleum hydrocarbons (PHCs, fractions F1-F4) and benzene, toluene, ethylbenzene and xylenes (BTEX), organo-chlorine pesticides and/or metals, mercury (Hg) and hexavalent chromium (CrVI).

3.3 Phase I Conceptual Site Model

Geological and Hydrogeological Setting

The Geological Survey of Canada website on the Urban Geology of the National Capital Area was consulted as part of this assessment. Based on this information, the bedrock in the area of the subject site is reported to consist of diorite of the Gabbro Formation and magmatic rocks of the Paragneiss Formation.

Overburden soils are reported to consist primarily of Precambrian bedrock. Small areas of till and marine deposits of clay and silt, with a drift thickness on the order of 3 to 5m, were reported to exist on the southern portion of the Phase I Property. Drift thickness over the remainder of the site was reported as 0 to 1m.

It should be noted that based on the findings of the Phase II ESA as well as the previous and concurrent Geotechnical Investigations, drift thickness over the site ranges from 0 to up to 20m below grade.

Groundwater flow is in a northerly direction.

Buildings and Structures

The Phase I Property is occupied by a 2-storey Clubhouse and restaurant, a 1-storey golf cart storage structure, a pump house and a 1-storey maintenance building referred to as the Turf Building. Other structures include a wash pad and concrete stalls for the storage of bunker sand. All buildings and structures were reportedly constructed in the early 1990's and are present on the southern portion of the Phase I Property.

Water Bodies

There are no water bodies on the Phase I Property. No bodies of water are present within the Phase I Property. The closest bodies of water are the Carp River and Watt's Creek, situated approximately 1.4km southwest and 1.5km east of the Phase I Property, respectively.

Areas of Natural Significance

No areas of natural significance were identified on the Phase I Property or within the Phase I ESA Study Area.

Drinking Water Wells

The online interactive well record mapping system was accessed on May 22, 2018. Potable well records were not identified for the Phase I Property although it has been reported that the aesthetic and irrigation water is provided to the Phase I Property by a drilled well.

Ten (10) records for domestic wells were identified within the Phase I Study Area. The wells were installed between 1961 and 1987, with one well installed in 2007. One record for a potable well abandonment was also identified. All of the wells were installed within bedrock which was reported to consist of a combination of limestone, sandstone, quartzite and/or granite.

It should be noted that the Phase I Property and properties within the Phase I Study Area are currently provided with municipal drinking water. It is considered likely that the well installed in 2007 is part of a ground source heat pump system.

Monitoring Well Records

No monitoring wells were identified for the Phase I Property or for any properties within the Phase I Study Area.

Neighbouring Land Use

Neighbouring land use in the Phase I Study Area is primarily residential with some parkland and institutional properties (schools).

Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APECs)

As presented in Table 1 in the previous section, on-site PCAs resulting in APECs on the Phase I Property include the storage of fuel (2 ASTs) as well as the storage and application of pesticides. Since the time of the Phase I ESA, imported fill material has also been identified as an on-site PCA resulting in an APEC.

No historical or existing off-site PCAs were identified for properties within the Phase I Study Area. PCAs and resulting APECs are presented on Drawing PE4321-1 – Site Plan and Drawing PE4321-1A – Site Plan (Enlargement) appended to the Phase I ESA.

Contaminants of Potential Concern (CPCs)

CPCs identified with the aforementioned APECs include benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4) and organo-chlorine pesticides in the soil and groundwater. Note that since the time of the Phase I ESA, metals (including mercury and hexavalent chromium) have been identified as CPCs.

Assessment of Uncertainty and/or Absence of Information

The information available for review as part of the preparation of this Phase I-ESA is considered to be sufficient to conclude that there are PCAs on the Phase I Property which may have impacted the subject land. The presence of PCAs was confirmed by a variety of independent sources, and as such, the conclusions of this report are not affected by uncertainty which may be present with respect to the individual sources.

3.4 Deviations from Sampling and Analysis Plan

The Sampling and Analysis Plan for this project is included in Appendix 1 of this report. There were no deviations from the Sampling and Analysis Plan.

3.5 Impediments

Physical impediments encountered during the Phase II ESA field program include the location of buried services and the fenced storage area adjacent to the Turf Building which limited the selection of borehole locations on the southeastern portion of the site.

As the Phase II Property is occupied by an operational golf course, borehole locations were limited to the roughs, off the edges of the fairways. To minimize damage to the golf course, near surface samples were collected using sampling equipment provided by ClubLink and where samples were required on the greens, they were taken from the fringe at the request of ClubLink. Otherwise no physical impediments were encountered.

4.0 INVESTIGATION METHOD

4.1 Subsurface Investigation

The subsurface investigation was conducted during the interim of February 27 through April 30, 2019. The field program consisted of drilling 20 boreholes to depths ranging from approximately 0.99 to 9.78m below grade. Boreholes BH2, BH3, BH8, BH10, BH11, BH12, BH13, BH15, BH16, BH17, BH18, BH19 and BH20 were completed with monitoring well installations. Bedrock was cored at BH2, BH3 and BH17 through BH20 for the purpose of intercepting the groundwater table. The field program also consisted of the placement of 20 hand auger holes across the Phase II Property, to obtain shallow soil samples.

A supplemental field investigation was carried out on May 4, 2020, at which time an additional 34 hand auger holes were placed across the Phase II Property. The purpose of the supplemental sampling was to delineate mercury exceedances previously identified in the shallow soils on Parcel 3, and to provide additional coverage of the greens and fairways.

All boreholes were drilled with a track-mounted CME 55 power auger drill rig, provided by George Downing Estate Drilling of Hawkesbury, Ontario, under the full-time supervision of Paterson personnel. As noted above, near surface soil samples were collected by Paterson personnel using a hand auger provided by ClubLink.

A 1-inch diameter hand auger was used to collect vertical delineation samples on Parcel 3. Borehole and hand auger locations are shown on Drawing PE4321-3R – Test Hole Location Plan, appended to this report.

4.2 Soil Sampling

A total of 110 soil samples were obtained from the boreholes by means of sampling directly from auger flights and split spoon sampling, a total of 21 rock core samples were collected by means of bedrock coring, and 87 shallow grab samples were collected from the hand auger holes. The depths at which auger samples, split spoon samples and rock core samples were obtained from the boreholes are shown as "**AU**", "**SS**" and "**RC**" on the Soil Profile and Test Data Sheets, appended to this report. During the 2019 field program, grab samples collected from the hand auger holes were retrieved from approximately 0.05 to 0.25m below grade.

A total of 65 shallow grab samples were collected from the hand auger holes placed during the 2020 field program and were retrieved from depth intervals of 0.05 to 0.15m, 0.15m to 0.30m and/or 0.30 to 0.60m below grade (Parcel 3 only).

Site soils at the borehole locations generally consist of topsoil or a pavement structure over fill (primarily engineered fill or reworked native material), underlain by silty clay, glacial till and gneiss bedrock. Depth to bedrock varies across the site, and was confirmed at boreholes BH2, BH3 and BH17 through BH20 at depths ranging from approximately 0.59 to 3.12m below ground.

It should be noted that approximately 190 probeholes were placed across the Phase II Property, as part of the concurrent Geotechnical Investigation, to confirm bedrock depths. Bedrock across the Phase II Property generally ranges from approximately 0 to 20m below grade. Probehole locations have been shown on Drawing PE4321-3R – Test Hole Location Plan, for informative purposes.

4.3 Field Screening Measurements

All soil samples collected were subjected to a preliminary screening procedure, which included visual screening for colour/staining and evidence of fill material/ metal impacts. Soil vapour screening with an RKI Eagle gas detector with methane elimination and calibrated to hexane was conducted on samples recovered from boreholes on the southeastern portion of the Phase II Property (Parcel 1; in the vicinity of the ASTs and Turf Building) where the potential for petroleum hydrocarbon impacts was identified in the Phase I ESA.

The combustible vapours for soil samples collected from BH1 through BH5 were measured by inserting the analyzer probe into the nominal headspace above the soil sample. Samples were then agitated/manipulated gently as the measurements were taken. The peak reading registered within the first 15 seconds was recorded as the vapour measurement.

The parts per million (ppm) scale is used to measure concentrations of hydrocarbon vapours that are too low to register on the Lower Explosive Limit (LEL) scale. The explosive point, 100% LEL, represents the leanest mixture which will burn (or explode) if ignited.

The combustible vapour readings ranged from less than 5ppm to 45ppm and were not considered to be indicative of lighter fraction petroleum hydrocarbon compounds. Vapour readings are noted on the Soil Profile and Test Data Sheets in Appendix 1.

No visual or olfactory indications of potential hydrocarbons, or visual indications of deleterious fill material or metal impacts, were identified in the soil samples. Soil samples were selected based on a combination of the results of the vapour screening, visual screening, sample depth and/or sample location.

4.4 Groundwater Monitoring Well Installation

Thirteen (13) groundwater monitoring wells were installed on the Phase II Property, at boreholes BH2, BH3, BH8, BH10, BH11, BH12, BH13, BH15, BH16, BH17, BH18, BH19 and BH20. The monitoring wells consisted of 32mm or 51mm diameter Schedule 40 threaded PVC risers and screens. Monitoring well construction details are listed below in Table 2: Monitoring Well Construction Details provided in the Tables Section following the body of the report and are also presented on the Soil Profile and Test Data Sheets provided in Appendix 1.

4.5 Field Measurement of Water Quality Parameters

Groundwater sampling was conducted at BH2, BH3, BH8, BH11, BH13, BH17 and BH20 on March 22, 2019, April 29, April 30 and May 17, 2019. During these sampling events, water quality parameters were measured in the field using a multi-parameter analyzer. Parameters measured in the field included temperature, pH, and electrical conductivity.

Field parameters were measured after each well volume purged. Wells were purged prior to sampling until at least three well volumes had been removed or the field parameters were relatively stable. Stabilized field parameter values are summarized in Table 3: Field Measurement of Water Quality Parameters appended to this report.

4.6 Groundwater Sampling

Groundwater sampling protocols were followed using the MECP document entitled “Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario”, dated May 1996. During the 2019 groundwater sampling event, samples were obtained from monitoring wells installed in BH2, BH3, BH8, BH11, BH13, BH17 and BH20, using dedicated sampling equipment. Additional groundwater samples were recovered from BH15, BH16, BH18, BH19 and BH20 during the 2020 field program. Standing water was purged from each well prior to sampling. Samples were stored in coolers to reduce analyte volatilization during transportation. Details of our standard operating procedure for groundwater sampling are provided in the Sampling and Analysis Plan in Appendix 1.

4.7 Analytical Testing

Based on the guidelines outlined in the Sampling and Analysis Plan appended to this report, the soil and groundwater samples submitted for analytical testing are outlined in Table 4: Soil Samples Submitted for Analysis and Table 5: Groundwater Samples Submitted for Analysis, provided in the Tables Section of this report.

During the initial field drilling program carried out in 2019, boreholes were placed to address potential concerns in the vicinity of the turf building and AST storage areas. The remaining boreholes placed across the golf course were to provide general coverage of the site for both environmental and geotechnical reasons.

To prevent damage to the golf course from the operation of the heavy machinery, the fairways, greens and tee boxes were largely avoided and boreholes were primarily drilled within the roughs. Due to the surficial nature of pesticide/herbicide application, shallow auger samples (0-0.6m) were selected for analysis of OC Pesticides. The specific locations of each sample are provided in Table 4.

To further assess the potential for impacts from the use of pesticides/herbicides at the subject property, a shallow soil sampling program was subsequently carried out. Shallow samples were collected using hand-held equipment provided by the ClubLink. Despite the non-invasive nature of the

Paracel Laboratories (Paracel), of Ottawa, Ontario, performed the laboratory analysis on the samples submitted for analytical testing. Paracel is a member of the Standards Council of Canada/Canadian Association for Laboratory Accreditation (SCC/CALA). Paracel is accredited and certified by SCC/CALA for specific tests registered with the association.

4.8 Residue Management

All excavated soil, purge water and fluids from equipment cleaning were retained on-site.

4.9 Elevation Surveying

The monitoring well locations were selected by Paterson and located and surveyed in the field by Stantec. The ground surface elevations at the monitoring well locations are referenced to a geodetic datum and are presented on Drawing PE4321-3R - Test Hole Location Plan appended to this report.

4.10 Quality Assurance and Quality Control Measures

A summary of quality assurance and quality control (QA/QC) measures, including sampling containers, preservation, labelling, handling, custody, equipment cleaning procedures, and field quality control measurements is provided in the Sampling and Analysis Plan in Appendix 1.

5.0 REVIEW AND EVALUATION

5.1 Geology

Based on the information obtained during the current subsurface investigation, in combination with information obtained during previous and concurrent Geotechnical Investigations, site soils generally consist of topsoil over silty clay, underlain by glacial till, followed by bedrock.

Fill material was identified in the vicinity of the Turf Building (southeast portion of Parcel 1), consisting of engineered fill primarily associated with the pavement structure. Imported sand fill was identified in BH13 (southwest portion of Parcel 1), otherwise fill material identified across the Phase II Property consisted of reworked native material. Several bedrock outcrops were identified across the site; bedrock generally ranged in depth from approximately 0 to 20m below grade.

Groundwater was encountered within both the overburden and bedrock at depths ranging from approximately 0.10 to 3.35m below ground surface.

5.2 Groundwater Elevations, Flow Direction, and Hydraulic Gradient

Groundwater levels were measured during the groundwater sampling events on April 29 and April 30, 2019 and on May 5, 2020, using an electronic water level meter. Borehole BH12-19 was not found at the time of the 2020 field program. Groundwater levels are summarized in Table 6: Groundwater Level Measurements, provided in the Tables Section of this report.

Based on the 2019 groundwater elevations, contour mapping was completed. Groundwater contours as shown on Drawing PE4321-3R – Test Hole Location Plan, indicate that the groundwater beneath the Phase II Property flows in a northerly direction. A hydraulic gradient of approximately 0.012m/m was calculated.

5.3 Fine-Coarse Soil Texture

Based on field soil observations and grain size analysis previously completed as part of the concurrent Geotechnical Investigation conducted by Paterson, the clay soils on the Phase II Property are considered to be fine-grained. The results of the analyses are presented in Table 7: Grain Size Analysis in the Tables Section of this report.

Further grain-size analyses may allow the future use of fine-grained standards, however the more stringent coarse-grained standards have been selected for each parcel of land comprising the Phase II Property.

5.4 Soil: Field Screening

Field screening of the soil samples collected during drilling within the vicinity of the Turf Building, resulted in combustible vapour readings generally ranging from less than 5 to 45ppm. Field screening results of individual soil samples from BH1 through BH5 are provided on the Soil Profile and Test Data Sheets appended to this report.

5.5 Soil Quality

A total of 27 soil samples were submitted for analysis of BTEX, PHCs (F_1-F_4), metals, mercury and chromium VI, organochlorine pesticides (OCP), and/or pH. As previously noted, the selected soil standards vary according to the site conditions on each Parcel of the Phase II Property. The soil results have therefore been tabulated according to the parcel of land.

The parcels of land are identified on Drawing PE4321-4R – Analytical Testing Plan, along with the analytical test results.

5.5.1 Parcel 1 (MECP Table 3 Standards)

Analytical test results for soil samples recovered from Parcel 1 are presented in the following Tables:

- Table 8: Parcel 1 2019 Analytical Test Results, Soil - BTEX and PHCs (F_1-F_4);
- Table 9A: Parcel 1 – 2019 Analytical Test Results, Soil – Metals (including As, Sb, Se), Hg and CrVI;
- Table 9B: Parcel 1 – 2020 Analytical Test Results, Soil – Mercury (Hg);
- Table 10A: Parcel 1 – 2019 Analytical Test Results, Soil – Organochlorine Pesticides (OCPs); and
- Table 10B: Parcel 1 – 2020 Analytical Test Results, Soil – Organochlorine Pesticides (OCPs).

Based on the analytical test results, BTEX parameters were not identified above the laboratory method detection limits, in any of the soil samples submitted for

analytical testing. Petroleum hydrocarbon fractions identified in each sample were in compliance with the MECP Table 3 standards.

Mercury parameters identified in the 2020 hand auger samples HA3A-20 (2.5µg/g), HA7A-20 (0.5 µg/g), HA9A-20 (2.7µg/g), HA12A-20 (1.7µg/g), HA13A-20 (0.9µg/g) and HA17A-20 (0.8µg/g) were above the MECP Table 3 standard of 0.27µg/g. Mercury concentrations identified in Samples BH2-AU1 and BH4-AU1 were in compliance with the MECP Table 3 standards. Otherwise mercury was not identified in the remaining soil samples analysed.

Hexavalent chromium was not identified in any of the samples analysed. Metals parameters (including As, Sb and Se) identified in the soil samples analysed were in compliance with the MECP Table 3 standards.

Concentrations of δ-BHC were identified in each of the soil samples analysed. No other OCP concentrations were identified in any of the soil samples submitted for analytical testing. The test results comply with the MECP Table 3 standards.

5.5.2 Parcel 2 (MECP Table 3 Standards)

Analytical test results for soil samples recovered from Parcel 2 are presented in the following Tables:

- Table 11A: Parcel 2 – 2019 Analytical Test Results, Soil – Metals (including As, Sb, Se), Hg and CrVI;
- Table 11B: Parcel 2– 2020 Analytical Test Results, Soil – Mercury (Hg); and
- Table 12: Parcel 2 – 2019/2020 Analytical Test Results, Soil – Organochlorine Pesticides (OCPs).

Hexavalent chromium and mercury were not identified in Sample HA1-G1. Metals (including As, Sb and Se) identified in Sample HA1-G1 comply with the MECP Table 3 standards.

Mercury concentrations exceeding the MECP Table 3 standard of 0.27µg/g were identified in Samples HA5B-20 (0.4µg/g) and HA6A-20 (1.9µg/g). A mercury concentration of 0.1µg/g identified in Sample HA4A-20 complies with the MECP Table 3 standard.

No OCP concentrations were identified in any of the analysed samples, with the exception of δ-BHC concentrations in Samples HA5B-20 (0.044µ/g) and HA6A-20 (0.056µ/g). The soil samples comply with the MECP Table 3 standards.

5.5.3 Parcel 3 (MECP Table 7 Standards)

Analytical test results for soil samples recovered from Parcel 3 are presented in the following Tables:

- Table 13A: Parcel 3 – 2019 Analytical Test Results, Soil – Metals (including As, Sb, Se), Hg and CrVI;
- Table 13B: Parcel 3 – 2020 Analytical Test Results, Soil – Mercury (Hg); and
- Table 14: Parcel 3 – 2019/2020 Analytical Test Results, Soil – Organochlorine Pesticides (OCPs).

Metal parameters identified in Sample HA15-G1 are in compliance with the MECP Table 7 standards, with the exception of mercury, identified at a concentration of 2.3 µg/g. Sample HA14-G1 was subsequently submitted for mercury for horizontal delineation purposes; the concentration of mercury (0.6 µg/g) at this location was also determined to exceed the MECP Table 7 standard value.

Additional samples were submitted during the 2020 field program, to delineate the 2019 mercury exceedances identified. Mercury concentrations exceeding the MECP Table 7 standard were identified in Samples HA25A-20 (1.7µg/g) and HA28B-20 (1.0µg/g). Mercury concentrations of 0.2µg/g, below the MECP Table 7 standard, were identified in Samples HA27-20 and HA29A-20. Mercury concentrations were not identified in the remaining samples analysed.

Concentrations of δ-BHC were identified in Samples HA15-G1 (0.02µg/g) and HA25A-20 (0.067µg/g). No other OCP parameters were identified in the analysed samples, above the laboratory method detection limits. The test results are in compliance with the MECP Table 7 standards.

5.5.4 Parcel 4 (MECP Table 7 Standards)

Analytical test results for soil samples recovered from Parcel 4 are presented in the following Tables:

- ❒ Table 15A: Parcel 4– 2019 Analytical Test Results, Soil – Metals (including As, Sb, Se), Hg and CrVI;
- ❒ Table 15B: Parcel 4 – 2020 Analytical Test Results, Soil – Mercury (Hg); and
- ❒ Table 16: Parcel 4 – 2019/2020 Analytical Test Results, Soil – Organochlorine Pesticides (OCPs).

Concentrations of Hg and CrVI were not identified in Sample HA13-G1, while other metals parameters (including As, Sb and Se) were identified at concentrations below the MECP Table 7 standards.

Concentrations of mercury exceeding the MECP Table 7 standard were identified in Samples HA18A-20 (0.5µg/g), HA19A-20 (2.0µg/g) and HA32A-20 (2.6µg/g). Mercury concentrations below the MECP Table 7 standard were identified in Samples HA20A-20 and HA33B-20 and were not identified above the method detection limit in Sample HA34A-20.

Concentrations of δ-BHC were identified in Samples HA15-G1 (0.02µg/g), HA11-20 (0.03µg/g), HA19A-20 (0.047µg/g), HA32A-20 (0.082µg/g) and HA34A-20 (0.077µg/g). No other OCP parameters were identified in the analysed samples, above the laboratory method detection limits. The test results are in compliance with the MECP Table 7 standards.

5.5.4 Maximum Concentrations

The maximum soil concentrations present on the Phase II Property are presented in Table 17: Maximum Soil Concentrations. The remaining soil samples are in compliance with the selected MECP standards. Remaining parameters were not detected above the laboratory method detection limits.

5.6 Groundwater Quality

Groundwater samples from monitoring wells installed in BH2, BH3, BH8, BH11, BH13, BH15, BH16, BH17, BH18, BH19 and BH20 were submitted for laboratory analysis of BTEX and PHC (F_1-F_4), OCP parameters, metals (including As, Sb, Se) and/or mercury. The groundwater samples were obtained from the screened intervals noted on Table 2. No visual or olfactory evidence of petroleum hydrocarbons was noted on the groundwater at any of the borehole locations.

5.6.1 Parcel 1 (MECP Table 3 Standards)

The results of the analytical testing are presented tables, with laboratory certificates of analyses provided in Appendix 1:

- Table 18: Parcel 1 – Analytical Test Results, Groundwater – BTEX and PHCs (F_1-F_4);
- Table 19: Parcel 1 – Analytical Test Results, Groundwater – Organochlorine Pesticides (OCPs); and
- Table 20: Parcel 1 – Analytical Test Results, Groundwater - Metals (including As, Sb, Se) and Hg.

No BTEX or PHC parameters were detected above the laboratory method detection limits in any of the groundwater samples submitted for analytical testing. The results are in compliance with the MECP Table 3 standards.

It is our interpretation that the analyzed parameter concentrations do not indicate the potential presence of light non-aqueous phase liquids (LNAPLs). As previously noted, no free phase hydrocarbons were noted in the wells at the time of groundwater sampling event.

With the exception of hexachlorobutadiene identified in groundwater Sample BH8-GW1 (0.20 µg/L), no OC Pesticide concentrations were identified in the groundwater samples analysed. The detected concentration of hexachlorobutadiene is in compliance with the MECP Table 3 standard value of 0.44 µg/L.

Metal parameters identified in groundwater Sample BH8-GW2 comply with MECP Table 3 standards. It should be noted that mercury was not identified above the method detection limit.

5.6.2 Parcel 2 (MECP Table 3 Standards)

The results of the analytical testing are presented in the following Table:

- Table 21: Parcel 2 – Analytical Test Results, Groundwater – Organochlorine Pesticides (OCPs).

With the exception of hexachlorobutadiene identified in groundwater Sample BH11-GW1 (0.08 µg/L), no OC Pesticide concentrations were identified in the groundwater samples analysed. The detected concentration of hexachlorobutadiene is in compliance with the MECP Table 3 standard value of 0.44 µg/L. The laboratory certificates of analysis are provided in Appendix 1.

5.6.3 Parcel 3 (MECP Table 7 Standards)

The results of the analytical testing are presented in the following Tables:

- Table 22: Parcel 3 – Analytical Test Results, Groundwater – Metals (including As, Sb, Se) and Hg; and
- Table 23: Parcel 3 – Analytical Test Results, Groundwater – Organochlorine Pesticides (OCPs).

Metal parameters identified in the groundwater samples analysed comply with the MECP Table 7 standards. Mercury was not identified in any of the groundwater samples above the laboratory method detection limit.

No OCP concentrations were detected above the laboratory method detection limits in the groundwater sample analysed. The analytical test results comply with the MECP Table 7 standards. The laboratory certificates of analysis are provided in Appendix 1.

5.6.4 Parcel 4 (MECP Table 7 Standards)

The results of the analytical testing are presented the following Tables:

- Table 24: Parcel 4 – Analytical Test Results, Groundwater – Metals (including As, Sb, Se) and Hg; and

- ❒ Table 25: Parcel 4 – Analytical Test Results, Groundwater – Organochlorine Pesticides.

Metal parameters identified in the groundwater samples analysed comply with the MECP Table 7 standards. Mercury was not identified in any of the groundwater samples above the laboratory method detection limit.

No OCP parameter concentrations were detected above the laboratory method detection limits in the groundwater sample analysed. The analytical test results are in compliance with the MECP Table 7 standards. The laboratory certificates of analysis are provided in Appendix 1.

5.6.5 Maximum Concentrations

The maximum groundwater concentrations present on the Phase II Property are presented in Table 26: Maximum Groundwater Concentrations. All groundwater parameters identified are in compliance with the selected MECP standards. Remaining parameters were not detected above the laboratory method detection limits.

5.7 Quality Assurance and Quality Control Results

As per the Sampling and Analysis Plan, a duplicate soil sample was obtained at BH8. The RPD calculations for the original and duplicate sample are provided in Table 27: QA/QC Calculations – Soil appended to this report.

Although the RPDs calculated are outside of the acceptable range of 20% for two parameters, the remaining RPDs (78%) are within the acceptable range. The findings of the Phase II ESA are not considered to have been affected by the difference between these two samples.

A duplicate groundwater sample (DUP-GW) was obtained from BH2 during the May 17, 2019 groundwater sampling event. Both the original and duplicate sample were analysed for BTEX and PHC parameters. No parameter concentrations were detected in either sample.

All soil and groundwater samples were handled in accordance with the Analytical Protocol with respect to holding time, preservation method, storage requirement, and container type.

As per Subsection 47(3) of O.Reg. 153/04 as amended, a Certificate of Analysis has been received for each sample submitted for analysis and all Certificates of Analysis are appended to this report.

Overall, the quality of the field data collected during this Phase II ESA is considered to be sufficient to meet the overall objectives of this assessment.

5.8 Phase II Conceptual Site Model

The following section has been prepared in general accordance with the requirements of the MECP Record of Site Condition Regulation, O.Reg. 153/04, as amended, made under the Environmental Protection Act. Conclusions and recommendations are discussed in a subsequent section.

Site Description

The Phase II Property is located on the north side of Campeau Drive, between Kanata Avenue and Knudson Drive, in the City of Ottawa, Ontario. The Phase II Property is comprised of 4 parcels of land (identified as Parcel 1 through Parcel 4 on Drawing PE4321-3 - Test Hole Location Plan) and has an approximate total area of 71 hectares. The golf cart storage, Clubhouse and associated parking lot are present on the southwestern portion of the site while the southeastern portion of the site is developed with a maintenance building (the Turf Building). The remainder of the site is occupied by paved walking paths, grassed fairways, landscaped roughs and sand pits. Two man-made ponds are present on the south-central portion of the Phase II Property.

Site topography is generally undulating, with an overall gentle downward slope to the north. Site drainage consists primarily of sheet flow to catch basins in the paved areas, with surficial infiltration and some sheet flow to the aforementioned ponds in the landscaped areas.

The Phase II Property and surrounding properties are currently provided with municipal services and do not have private wells or septic systems.

Potentially Contaminating Activities and Areas of Potential Environmental Concern

As per Table 1 in Section 2.2, the following on-site potentially contaminating activities (PCAs) were considered to result in four (4) areas of potential environmental concern (APECs):

- Item 28, Table 2, O.Reg.153/04 as amended ("Gasoline and Associated Products Storage in Fixed Tanks"); based on the presence of two (2) aboveground storage tanks (ASTs), resulting in APEC 1;
- Item 30, Table 2, O.Reg.153/04 as amended ("Importation of Fill Material of Unknown Quality"); based on fill material identified during the Phase II ESA, resulting in APEC 4; and
- Item 40, Table 2, O.Reg.153/04 as amended ("Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications"); based on the storage and use of pesticides and herbicides, resulting in APECs 2 and 3.

No other historical or existing on-site PCAs were identified. No existing or historical off-site PCAs were identified within the 250m Phase I Study Area.

The rationale for identifying the above PCAs is based on a review of aerial photographs as well as field observations and personal interviews.

Contaminants of Potential Concern and Impacted Media

Based on the findings of the Phase I and Phase II ESA, the following Contaminants of Potential Concern (CPC) were identified with respect to the soil and/or groundwater beneath the Phase II Property:

- Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX);
- Petroleum Hydrocarbons fractions 1 through 4 (PHCs F_1-F_4);
- Organochlorine Pesticides; and
- Metals (including As, Sb and Se, Hg and CrVI).

Subsurface Structures and Utilities

On-site buried services consist of municipal water, sanitary and storm sewers, natural gas, electricity and telephone. An irrigation system is also present on the Phase II Property.

Underground service locates were completed prior to the subsurface investigation, however specific borehole locations were cleared as opposed to the entire Phase II Property. Therefore exact locations of the buried services are unknown. It should be noted that utility plans were not available for review.

Physical Setting

Site Stratigraphy

The site stratigraphy, as presented on Drawings PE4321-5, 6 and 7 – Cross-Sections A-A', B-B' and C-C', generally consists of the following

- Pavement structure consisting of approximately 0.08m of asphalt over 0.8 to 1.34m of engineered fill was identified at BH2-19 through BH5-19 in the vicinity of the Turf Building (Parcel 1) while granular material existed from surface at BH1. A similar pavement structure was also encountered at BH18 on the northeastern portion of the Phase II Property (Parcel 3).
- Topsoil or silty clay with topsoil and/or fill material consisting of reworked native silty clay, was identified at ground surface at BH6-19 through BH20-19. This layer ranged in depth from approximately 0.15 to 2.21m below grade.
- Native silty clay was identified beneath the topsoil or reworked native material at BH6-19 through BH1619 and BH20-19, to depths ranging from approximately 1.75 to 9.2m below grade.
- Glacial till was encountered below the fill layer or native silty clay at BH4-19, BH6-19, BH9-19, BH10-19, BH11-19, BH12-19, BH14-19 and BH16-19, to depths ranging from approximately 1.22 to 9.78m below grade.
- Metamorphic gneiss bedrock was confirmed at BH2-19, BH3-19, and BH5-19 and BH17-19 through BH20-19, at depths ranging from approximately 0.59 to 3.12m below grade. Inferred bedrock was encountered on practical refusal to augering at the remaining boreholes, at depths ranging from approximately 0.99 to 9.2m below grade. Refusal was not encountered at BH6-19 and BH12-19.

Hydrogeological Characteristics

Groundwater was encountered in silty clay or glacial till overburden layer and within the shallow bedrock beneath the Phase II Property. Based on water levels measured on April 29 and April 30, 2019, groundwater contour mapping was completed.

Based on the contours, groundwater beneath the Phase II Property is interpreted to flow in a northerly direction, with a hydraulic gradient of approximately 0.012m/m. Groundwater contours are shown on Drawing PE4321-3R – Test Hole Location Plan.

Approximate Depth to Bedrock

Based on the recovery of the bedrock during the coring operations, field observations and available geological mapping, the local bedrock consists of Precambrian mafic and ultramafic intrusive rocks (diorite, gabbro) and migmatic rocks (paragneiss, granitic origin). The overburden thickness is anticipated to vary between 0 and 20 m.

Approximate Depth to Water Table

Depth to the water table at the subject site varies between approximately 0.10m and 3.35m below existing grade. Long-term groundwater conditions can also be estimated based on the observed colour and consistency of the recovered soil samples. Based on these observations, it is estimated that long-term groundwater levels can be expected between 2 to 3 m depth. Groundwater levels are subject to seasonal fluctuations.

Sections 41 and 43.1 of the Regulation

Section 41 of the Regulation does not apply to the Phase II Property, in that the Phase II Property is not within 30m of an environmentally sensitive area, and the pH of surface soil is between 5 and 9, while the pH of subsurface soil is between 5 and 11.

Section 43.1 of the Regulation applies to Parcels 3 and 4 of the Phase II Property, where bedrock is located less than 2m below ground surface across more than one third of the site.

Fill Placement

Sand and gravel fill material was identified in the vicinity of the Turf Building on the southeastern portion of the site and along a pathway on the northeastern portion of the site. The fill material was considered to be associated with the pavement structures. Due to the proximity of the Turf Building and the depth of the fill material in this vicinity, the fill was assessed as part of the Phase II ESA.

Fill material was also identified at BH13 to a depth of approximately 2.29m below grade. The material consisted of brown silty sand with no signs of deleterious materials or potential contamination. As this fill was notably different from the reworked native material across the remainder of the site, it was analysed for potential contaminants. Fill assessment is further discussed in the Environmental Condition Section of the CSM.

Otherwise, fill material encountered during the Phase II ESA consisted of reworked native silty clay and was not considered to represent a concern to the Phase II Property.

Proposed Buildings and Other Structures

The Phase II Property is proposed to be developed with a residential subdivision comprised of residential dwellings, storm water management ponds, open space and parkland.

Existing Buildings and Structures

The Phase II Property is occupied by a 2-storey Clubhouse and restaurant, a 1-storey golf cart storage structure, a pump house and a 1-storey maintenance building referred to as the Turf Building. Other structures include a wash pad and concrete stalls for the storage of bunker sand. All buildings and structures were reportedly constructed in the early 1990's and are present on the southern portion of the Phase II Property. Other structures onsite include a wash pad and concrete stalls for the storage of clean sand fill, situated to the southwest of the Turf Building.

Water Bodies

There are no natural water bodies on the Phase II Property. The closest bodies of water are the Carp River and Watt's Creek, situated approximately 1.4km southwest and 1.5km east of the Phase II Property, respectively.

Areas of Natural Significance

No areas of natural significance were identified on the Phase II Property or within the Phase I ESA Study Area.

Environmental Condition

Areas Where Contaminants are Present

Based on the findings of the Phase II ESA, mercury concentrations exceeding the selected MECP standards selected were identified in the shallow soil (approximately 0.05 to 0.30m below ground surface) across the Phase II Property, as shown in red on Drawing PE4321-4R – Analytical Testing Plan. No other soil exceedances were identified. Groundwater is in compliance with the selected MECP standards as presented in blue on Drawing PE4321-4R.

Types of Contaminants

The contaminants of concern identified at the Phase II Property include mercury. No other contaminants were identified in the soil beneath the Phase II Property. No contaminants are present in the groundwater beneath the Phase II Property.

Contaminated Media

Based on the findings of the Phase II ESA, contaminated media includes areas of the near surface soil across the Phase II Property. Groundwater is in compliance with the selected MECP site standards.

What Is Known About Areas Where Contaminants Are Present

Mercury concentrations exceeding the MECP Table 3 and MECP Table 7 standards are present on each parcel comprising the Phase II Property. The mercury concentrations may be associated with the historical application of mercurial fungicides and/or heavy-metal based pesticides and herbicides on the golf course.

Groundwater concentrations were determined to be in compliance with the MECP Table 3 or Table 7 standards.

Distribution of Contaminants

Mercury concentrations were not detected in any of the groundwater samples analysed. The mercury impacts are considered to be contained to the overburden.

Discharge of Contaminants

As noted previously, mercury is considered to have been released directly to the ground surface through the historical application of mercurial fungicides and/or heavy-metal based pesticides and herbicides on the golf course.

Migration of Contaminants

A potential contaminant transport pathway is the physical transport from one location to another of contaminated soil, either intentionally or unintentionally, by earth moving equipment, vehicle traffic, or pedestrian traffic. Based on observations made during the Phase I and Phase II ESA, physical transport of contaminants on the Phase II Property is considered to be negligible.

Based on the low solubility nature of heavy metals and clean groundwater results across the Phase II ESA Property, significant contaminant migration is not considered to have occurred on the Phase II Property.

Climatic and Meteorological Conditions

In general, climatic and meteorological conditions have the potential to affect contaminant distribution. Two ways by which climatic and meteorological conditions may affect contaminant distribution include the downward leaching of contaminants by means of the infiltration of precipitation, and the migration of contaminants via groundwater levels and/or flow, which may fluctuate seasonally. Given the low solubility of mercury and clean groundwater results in the vicinity of the identified soil exceedances, downward leaching by means of infiltration of precipitation is not considered to have occurred on the Phase II Property. As such, groundwater levels and/or flow are also not considered to have had the potential to affect contaminant distribution.

Potential for Vapour Intrusion

There is no potential for vapour intrusion to occur within existing building structures based on the location and non-volatile nature of the contaminants.

Contaminant Transport

Human health receptors would include golf club staff and members. Due to the nature and location of the contaminants in the shallow soils on the Phase II Property, and the nature of the activities carried out onsite, the potential for human health risk is considered to be low.

During the Phase II ESA field program, potential human health receptors included the drillers and Paterson field staff. Potential receptor exposure points included any excavations into contaminated soil, including boreholes and hand auger holes. Routes of exposure would include dermal contact, accidental ingestion, and inhalation of contaminated soil as particulate dust.

Potential ecological receptors include plants whose root structures intercept contaminated soil, burrowing wildlife, and groundwater/surface water receptors downgradient of the Phase II Property at groundwater discharge points. Based on the findings of the Phase II ESA in combination with the dense urban landscape surrounding the Phase II Property, no significant receptors are expected to be present downgradient of the Phase II Property.

6.0 CONCLUSIONS

Assessment

A Phase II ESA was conducted for the property addressed 7000 Campeau Drive, herein referred to as the Phase II Property, in the City of Ottawa, Ontario. It should be noted that the Phase II Property is comprised of four (4) parcels of land identified as Parcels 1 through 4 for the purposes of this report.

The purpose of the Phase II ESA was to assess the soil and groundwater quality on or beneath the Phase II Property, within areas of potential environmental concern (APECs) identified during the Phase I ESA carried out by Paterson and dated December 2018. An initial Phase II ESA field program was carried out in 2019, with a supplemental field program carried out in 2020. The findings of both field programs constitute the Phase II ESA and are presented in this updated Phase II ESA report.

2019 Investigation

The 2019 Phase II ESA field program was carried out in conjunction with a Geotechnical Investigation and consisted of drilling 20 boreholes across the Phase II Property, 13 of which were constructed with groundwater monitoring well installations, and the placement of 20 shallow hand auger holes. Approximately 190 probeholes were also completed as part of the Geotechnical Investigation, in order to confirm bedrock depth in areas of deep overburden.

Soil samples obtained from the boreholes and auger holes were screened primarily using visual observations. Samples collected from within the vicinity of the Turf Building and aboveground storage tanks (ASTs) were also screened using combustible vapour measurements. Based on the screening results in combination with sample depth and location, a total of 27 soil samples, including a duplicate sample, were submitted for laboratory analysis of benzene, toluene, ethylbenzene and xylenes (BTEX), petroleum hydrocarbons (PHCs, F1-F4), metals and/or organochlorine pesticides (OCPs).

Based on the analytical test results, no BTEX parameters or PHC (F1) were identified in the soil samples submitted for testing. Petroleum hydrocarbon F2, F3 and/or F4 fractions were identified in shallow auger flight samples recovered from BH2, BH3 and BH5, within the vicinity of the ASTs and Turf Building on the southeastern portion of the Phase II Property (Parcel 1).

Metals parameters were also identified in the fill material on this portion of the Phase II Property, while no OCPs were detected in the sample recovered from BH3. The PHC and metal parameters identified were in compliance with the MECP Table 3 standards, selected based on the site conditions within Parcel 1.

Metal and OCP analyses were conducted on shallow soil samples collected from the greens, fairways and/or roughs across the Phase II Property. Concentrations of δ-BHC ranging from 0.01 to 0.03µg/g were identified in shallow soil Samples HA3-G1, HA11-G1 and HA15-G1. Otherwise, no OCP pesticides were identified in any of the samples analysed.

Metal parameters were identified in all samples analysed. Concentrations of mercury identified in the soil recovered from HA14 and HA15 on the northeastern portion of the Phase II Property (Parcel 3) exceeded the MECP Table 7 standards selected for this portion of the site. The remaining metal parameters identified on the Phase II Property at the time of the 2019 field program, were in compliance with the MECP Table 3 or MECP Table 7 standards.

Groundwater samples from monitoring wells installed in BH2, BH3, BH8, BH11, BH13, BH17 and BH20 were recovered and analysed for BTEX, PHCs, OCPs and/or mercury. No free-phase product was observed on the groundwater at any of the monitoring well locations during the February, April and May 2019 sampling events. Based on analytical test results, no BTEX, PHC or mercury concentrations were identified above the laboratory method detection limits in the groundwater samples analysed. No OCP parameters were detected above the laboratory method detection limits, with the exception of hexachlorobutadiene concentrations in groundwater samples recovered from BH8 and BH11 on Parcels 1 and 2 of the Phase II Property. The identified concentrations were in compliance with the MECP Table 3 standards.

2020 Supplemental Investigation

In May of 2020, 34 additional shallow hand auger holes were placed across the Phase II Property to provide additional coverage of the greens, tees and/or fairways, and to delineate previously identified mercury impacts on Parcel 3. A total of 65 shallow soil samples were collected from depths of 0.05 to 0.15m and 0.15m to 0.30m with deeper samples (0.30 to 0.60m) collected at the locations of the original (2019) mercury exceedances.

Soil samples were submitted for analytical testing of mercury and/or organochlorine pesticides. Concentrations of δ-BHC ranging from 0.021µg/g to 0.097µ/g, were identified in each of the samples analysed. Otherwise, no OCP pesticides were identified in any of the samples analysed.

Based on the findings of the analytical testing, mercury concentrations exceeding the selected MECP standards were identified on each Parcel of land comprising the golf course. The mercury concentrations are considered to be present in pockets across the course and are considered to be confined to the upper 0.3 to 0.6m of soil.

On May 5, 2020, groundwater samples from monitoring wells installed in BH8, BH15, BH16, BH18, BH19 and BH20 were recovered and submitted for analytical testing of metals (including As, Sb, Se) and mercury or OCPs. No visual or olfactory indications of potential contamination were observed on the groundwater at any of the monitoring well locations. Based on analytical test results, no OCP or mercury concentrations were identified above the laboratory method detection limits in the groundwater samples analysed. Metal parameters identified in the groundwater samples were in compliance with the selected MECP standards.

Conclusion

Based on the findings of the Phase II ESA, mercury concentrations exceeding the MECP Table 7 and Table 3 standard of 0.27 µg/g were identified in shallow soil samples collected from various locations across the Phase II Property. The mercury is considered to be present in pockets across the site, within the shallow soils, to a maximum depth of approximately 0.6m below grade. Otherwise the soil on and beneath the Phase II Property is in compliance with the selected MECP standards. Groundwater beneath the Phase II Property is in compliance with the applicable MECP standards.

The presence of impacted shallow soils is not considered to represent a concern to the continued use of the site as a golf course. It is recommended that a soil remediation program be carried out at the Phase II Property in conjunction with the redevelopment of the site.

It is expected that the groundwater monitoring wells will be abandoned in accordance with Ontario Regulation 903 at the time of construction excavation. Until this time, it is recommended that they remain in place for possible future groundwater monitoring events.

7.0 STATEMENT OF LIMITATIONS

This Phase II - Environmental Site Assessment report has been prepared in general accordance with O.Reg. 153/04 as amended and meets the requirements of CSA Z769-00. The conclusions presented herein are based on information gathered from a limited sampling and testing program. The test results represent conditions at specific test locations at the time of the field program.

The client should be aware that any information pertaining to soils and all test hole logs are furnished as a matter of general information only and test hole descriptions or logs are not to be interpreted as descriptive of conditions at locations other than those of the test holes themselves.

Should any conditions be encountered at the subject site and/or historical information that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of ClubLink Corporation ULC. Notification from ClubLink Corporation ULC and Paterson Group will be required to release this report to any other party.

Paterson Group Inc.

Karyn Munch, P.Eng., QP$_{ESA}$

Mark S. D'Arcy, P.Eng., QP$_{ESA}$

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FIGURES

FIGURE 1 – KEY PLAN

DRAWING PE4321-3R – TEST HOLE LOCATION PLAN

DRAWING PE4321-4R – ANALYTICAL TESTING PLAN – PARCEL 1

DRAWING PE4321-5R – ANALYTICAL TESTING PLAN – PARCEL 2

DRAWING PE4321-6R – ANALYTICAL TESTING PLAN – PARCEL 3

DRAWING PE4321-7R – ANALYTICAL TESTING PLAN – PARCEL 4

DRAWING PE4321-8 – CROSS-SECTION A-A'

DRAWING PE4321-9 – CROSS-SECTION B-B'

DRAWING PE4321-10 – CROSS-SECTION C-C'

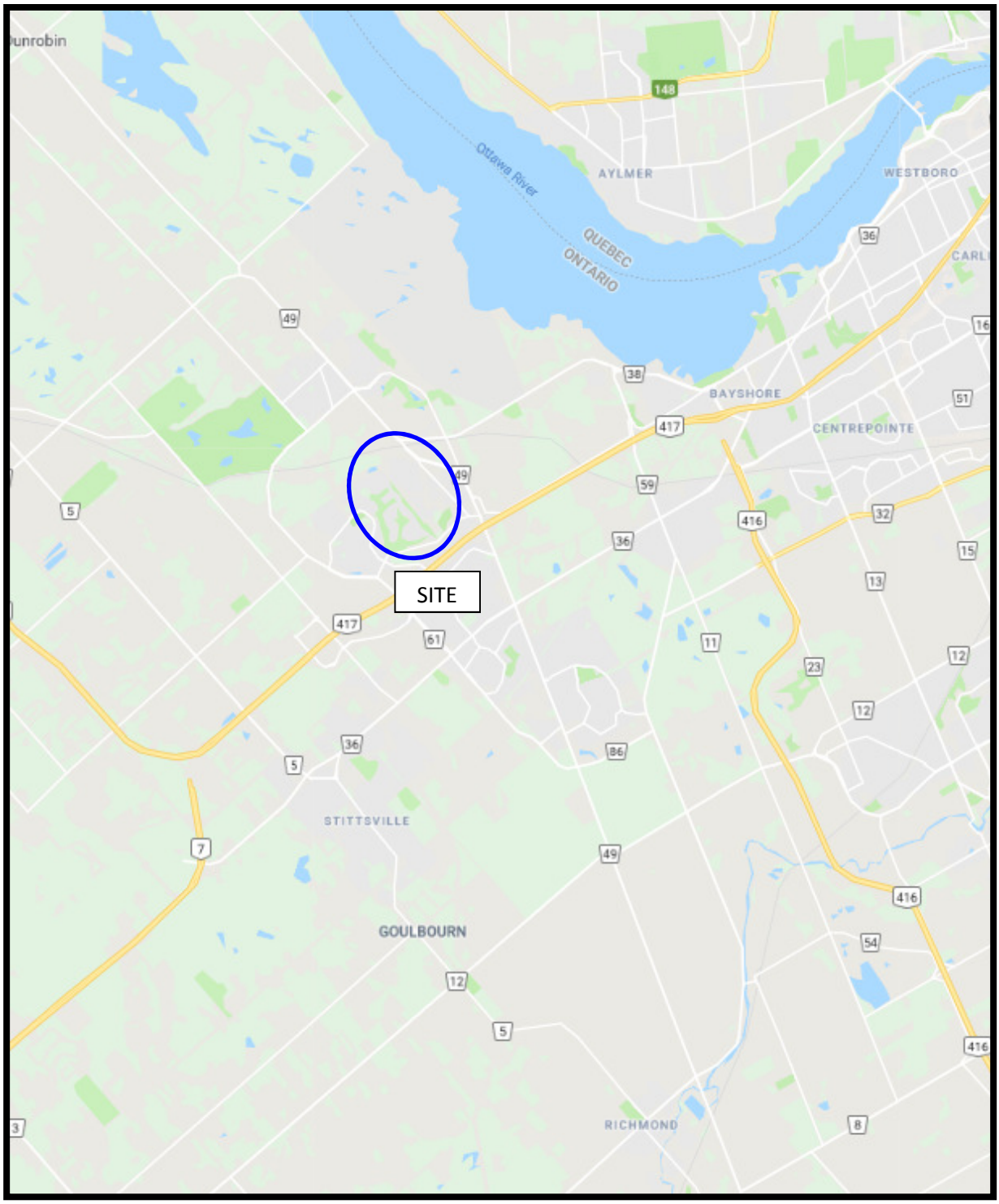

FIGURE 1

KEY PLAN

LEGEND:

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- AUGER HOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, PREVIOUS INVESTIGATION, PATERSON GROUP REPORT PG4135, JANUARY 2018
- BOREHOLE LOCATION BY OTHERS
- C—C CROSS SECTION LOCATION
- 105.20 GROUND SURFACE ELEVATION (m)
- [104.29] BEDROCK SURFACE ELEVATION (m)
- (104.40) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- {98.86} GROUNDWATER SURFACE ELEVATION (m)
- 102.0 GROUNDWATER CONTOUR(m)
- (0.013m/m) APPROXIMATE GROUNDWATER FLOW DIRECTION (HORIZONTAL HYDRAULIC GRADIENT)

TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS (CURRENT INVESTIGATION) PROVIDED BY STANTEC GEOMATICS LIMITED.

0 100 200 300 500m

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MINTO COMMUNITIES INC.

PHASE I - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

TEST HOLE LOCATION PLAN

Scale: 1:7500	Date: 01/2021
Drawn by: RCG	Report No.: PE4321-2
Checked by: KM	PE4321-3R
Approved by: MSD	Revision No.:

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1	2020 HAND AUGER HOLE LOCATIONS ADDED	19/05/2020	KM

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KANATA GOLF AND COUNTRY CLUB
OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - PARCEL 1

Stamp:

Scale:	1:2500
Drawn by:	MPG
Checked by:	KM
Approved by:	MSD
Date:	05/2019
Report No.:	PE4321-2
Drawing No.:	PE4321-4R
Revision No.:	1

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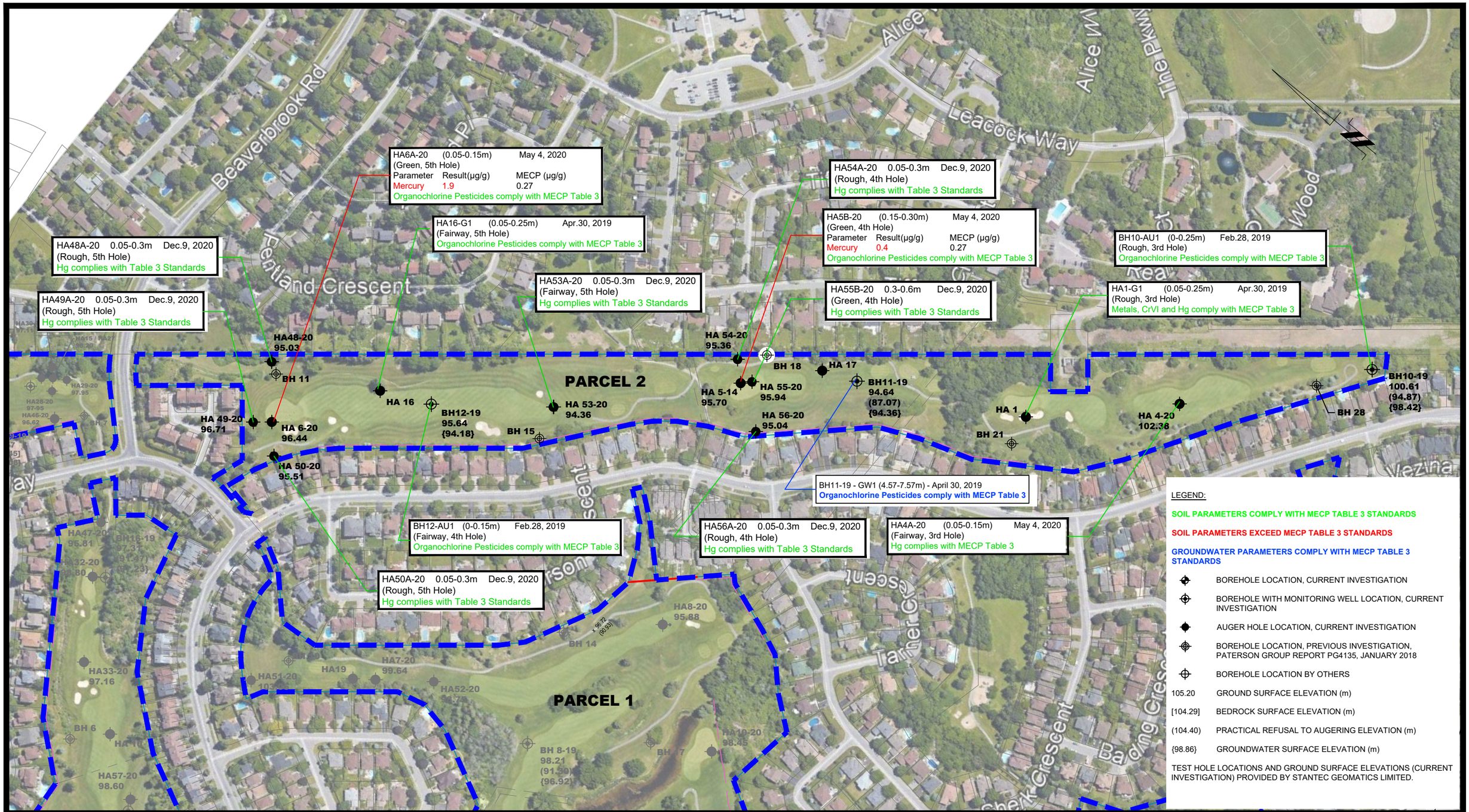

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PHASE I - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - PARCEL 2

Scale: 1:3500	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	PE4321-5R
Approved by: MSD	Revision No.:

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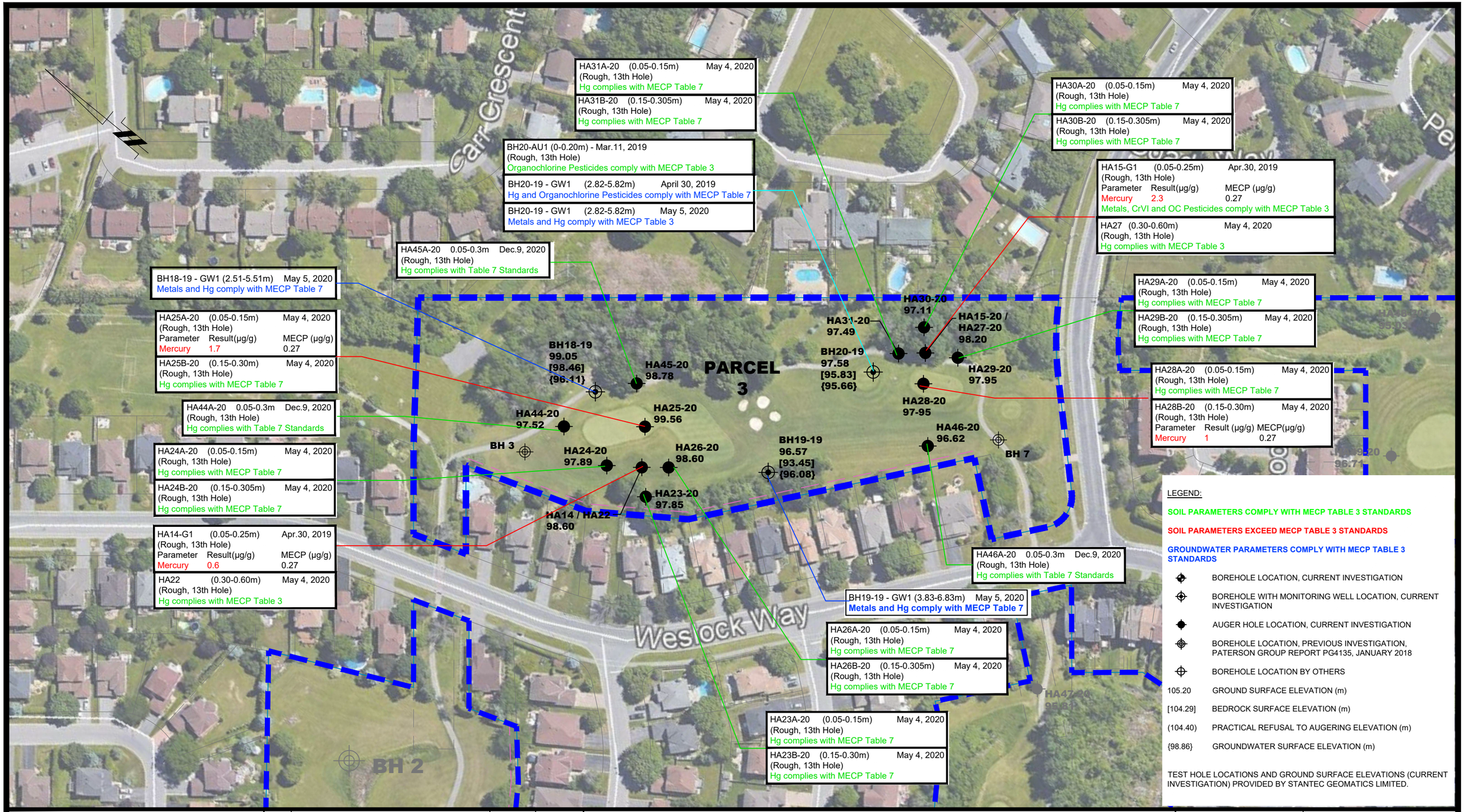

LEGEND:

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

SOIL PARAMETERS EXCEED MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- AUGER HOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, PREVIOUS INVESTIGATION, PATERSON GROUP REPORT PG4135, JANUARY 2018
- BOREHOLE LOCATION BY OTHERS
- 105.20 GROUND SURFACE ELEVATION (m)
- [104.29] BEDROCK SURFACE ELEVATION (m)
- (104.40) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- {98.86} GROUNDWATER SURFACE ELEVATION (m)

TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS (CURRENT INVESTIGATION) PROVIDED BY STANTEC GEOMATICS LIMITED.

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PHASE I - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - PARCEL 3

Scale: AS SHOWN	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	PE4321-6R
Approved by: MSD	Revision No.:

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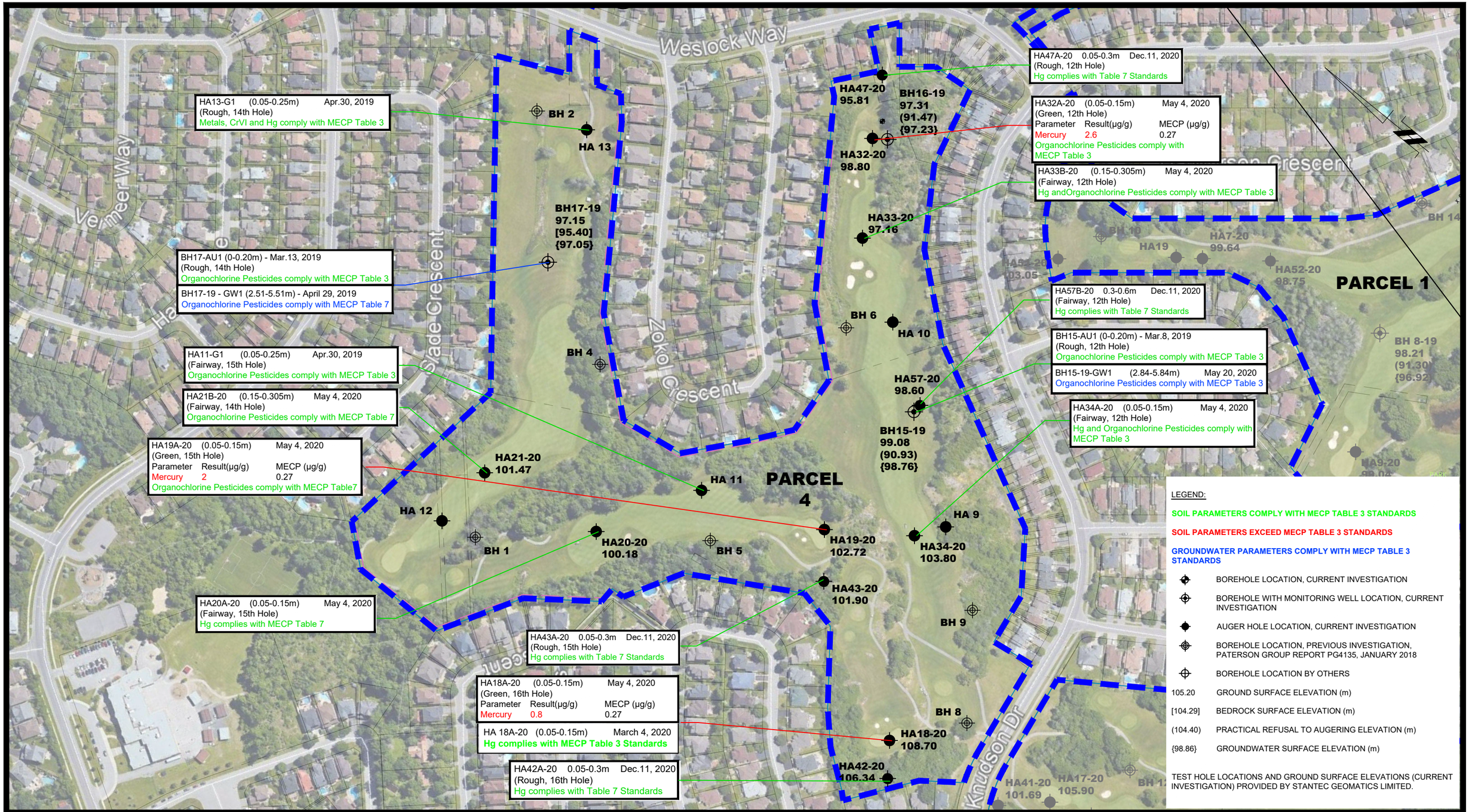

LEGEND:

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

SOIL PARAMETERS EXCEED MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

- BOREHOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE WITH MONITORING WELL LOCATION, CURRENT INVESTIGATION
- AUGER HOLE LOCATION, CURRENT INVESTIGATION
- BOREHOLE LOCATION, PREVIOUS INVESTIGATION, PATERSON GROUP REPORT PG4135, JANUARY 2018
- BOREHOLE LOCATION BY OTHERS
- 105.20 GROUND SURFACE ELEVATION (m)
- [104.29] BEDROCK SURFACE ELEVATION (m)
- (104.40) PRACTICAL REFUSAL TO AUGERING ELEVATION (m)
- {98.86} GROUNDWATER SURFACE ELEVATION (m)

TEST HOLE LOCATIONS AND GROUND SURFACE ELEVATIONS (CURRENT INVESTIGATION) PROVIDED BY STANTEC GEOMATICS LIMITED.

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KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

ANALYTICAL TESTING PLAN - PARCEL 4

Scale: 1:3000	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	PE4321-7R
Approved by: MSD	Revision No.:

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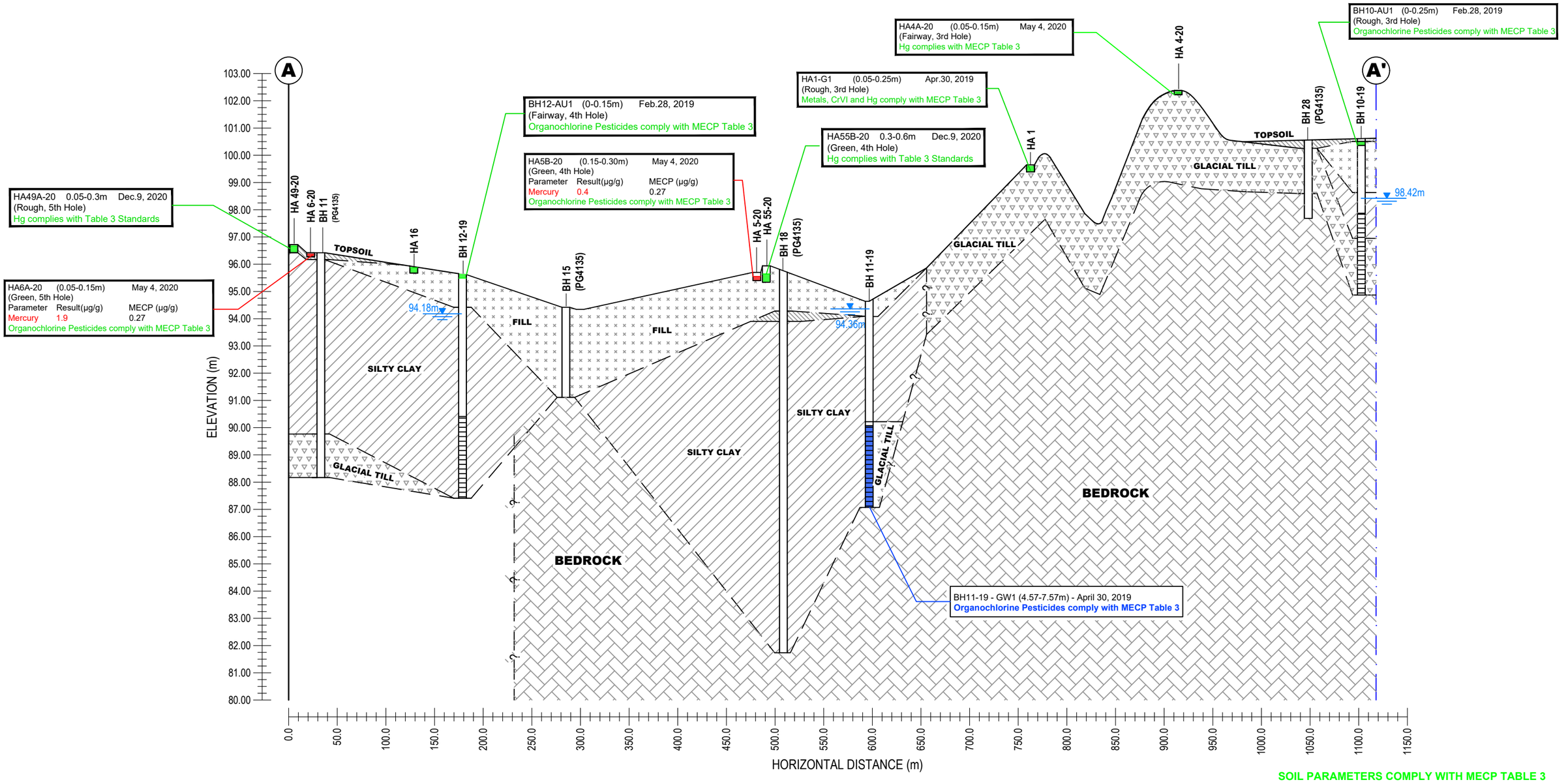

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

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PHASE I - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

CROSS-SECTION A-A'

Scale: AS SHOWN	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	PE4321-8R
Approved by: MSD	Revision No.:

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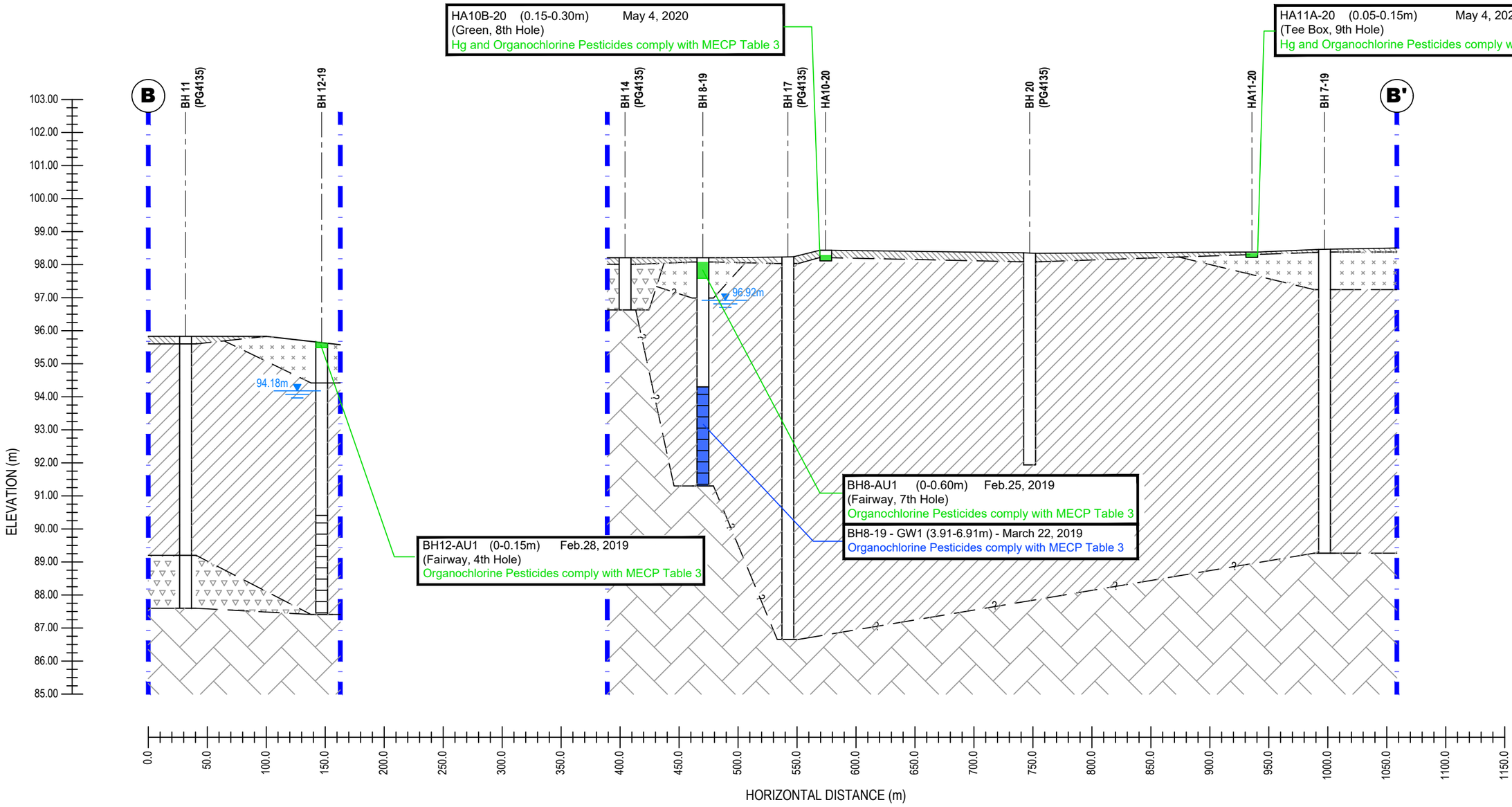

SOIL PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

GROUNDWATER PARAMETERS COMPLY WITH MECP TABLE 3 STANDARDS

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PHASE I - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

CROSS-SECTION B-B'

Scale: AS SHOWN	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	PE4321-9R
Approved by: MSD	Revision No.:

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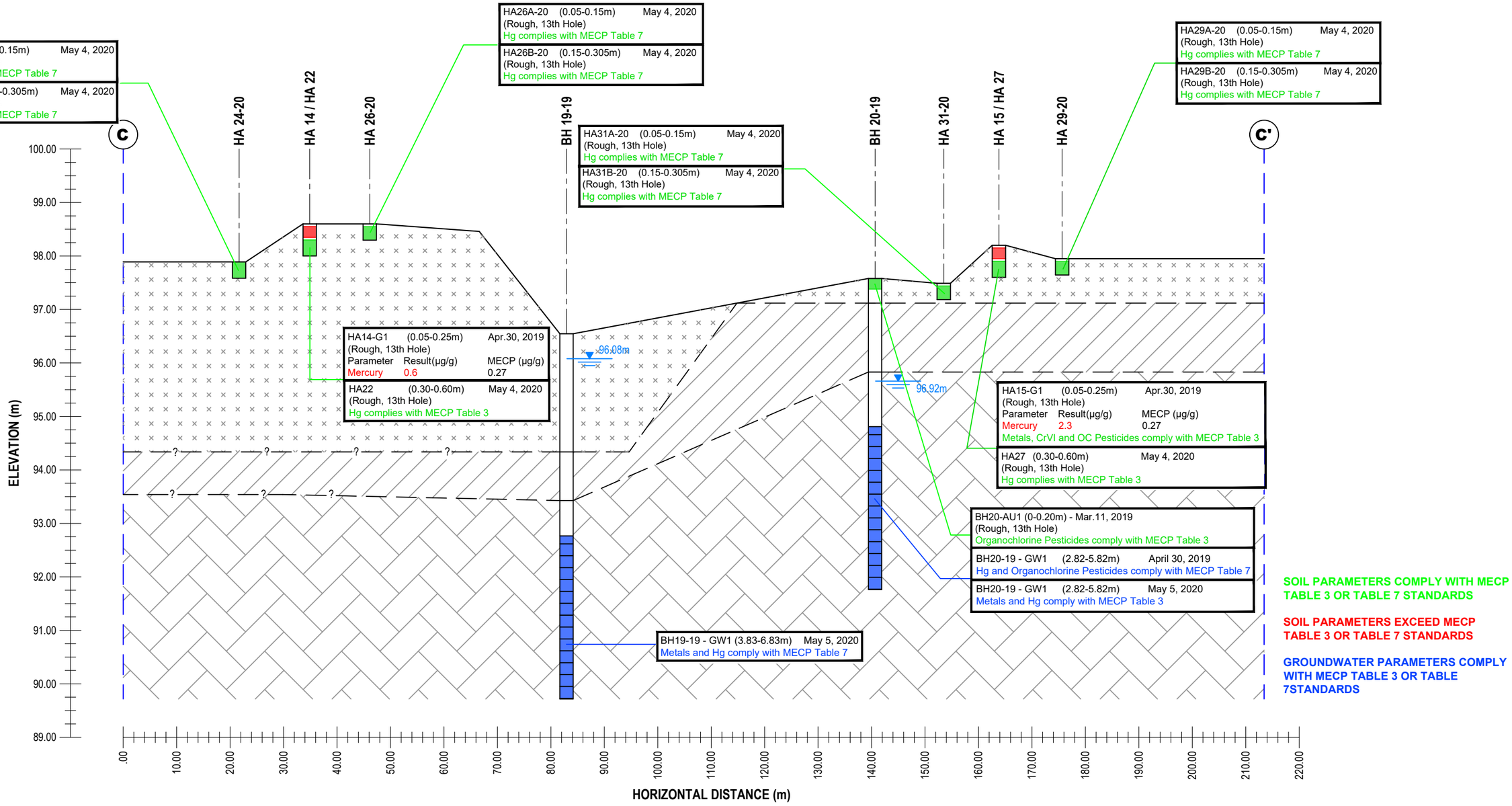

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PHASE II - ENVIRONMENTAL SITE ASSESSMENT
KANATA GOLF AND COUNTRY CLUB

OTTAWA, ONTARIO

Title:

CROSS-SECTION C-C'

Scale: AS SHOWN	Date: 01/2021
Drawn by: MPG	Report No.: PE4321-2
Checked by: KM	Dwg. No.: PE4321-10R
Approved by: MSD	Revision No.:

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TABLES

TABLE 24: PARCEL 4 –ANALYTICAL TEST RESULTS, GROUNDWATER – METALS (INCLUDING As, Sb, Se) Hg, CrVI

TABLE 25: PARCEL 4 –ANALYTICAL TEST RESULTS, GROUNDWATER – ORGANOCHLORINE PESTICIDES

TABLE 26: MAXIMUM GROUNDWATER CONCENTRATIONS

TABLE 27: QA/QC CALCULATIONS - SOIL

Table 1: Areas of Potential Environmental Concern

Area of Potential Environmental Concern	Location of Area of Potential Environmental Concern with respect to Phase I Property	Potentially Contaminating Activity	Location of PCA (on-site or off-site)	Contaminants of Potential Concern	Media Potentially Impacted (Groundwater, Soil, and/or Sediment)
APEC 1 (resulting from the presence of two ASTs)	Southeastern portion of the Phase I Property	PCA 28 – Gasoline and Associated Products Storage in Fixed Tanks	On-site	BTEX PHCs (F_1-F_4)	Soil and Groundwater
APEC 2 (resulting from the storage of pesticides and herbicides)	Southeastern portion of the Phase I Property	PCA 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications	On-site	OC Pesticides[1] Metals Hg CrVI	Soil and/or Groundwater
APEC 3 (resulting from application of pesticides and herbicides)	Across the Phase I Property (fairways and landscaped areas)	PCA 40 – Pesticides (including Herbicides, Fungicides and Anti-Fouling Agents) Manufacturing, Processing, Bulk Storage and Large-Scale Applications.	On-site	OC Pesticides[1] Metals Hg CrVI	Soil and/or Groundwater
APEC 4[2] (resulting from importation of fill material of unknown quality)	Southeastern portion of Phase II Property	PCA 30 – Importation of Fill material of Unknown Quality	On-site	Metals Hg CrVI	Soil

Note:
- 1 – Organochlorine Pesticides
- 2 – APEC identified based on observations made during Phase II ESA

Table 2: Monitoring Well Construction Details

Well ID	Ground Surface Elevation	Total Depth (m BGS)	Screened Interval (m BGS)	Sand Pack (m BGS)	Bentonite Seal (m BGS)	Casing Type
BH2	105.20	6.40	3.40-6.40	3.05-6.40	0.03-3.05	Flush-mount
BH3	105.72	6.83	3.83-6.83	3.51-6.83	0.03-3.51	Flush-mount
BH8	98.21	6.91	3.91-6.91	3.35-6.91	0.05-3.35	Stick-up
BH10	100.61	5.74	2.74-5.74	2.13-5.74	0.03-2.13	Stick-up
BH11	94.64	7.57	4.57-7.57	4.01-7.57	0.03-4.01	Stick-up
BH12	95.64	8.23	5.23-8.23	4.17-8.23	0.03-4.17	Stick-up
BH13	102.84	7.72	4.72-7.72	4.27-7.72	0.03-4.27	Stick-up
BH15	99.08	8.15	5.18-8.15	4.27-8.15	0.03-4.27	Stick-up
BH16	97.31	5.84	2.84-5.82	2.49-5.82	0.03-2.49	Stick-up
BH17	97.15	5.51	2.51-5.51	2.20-5.51	0.03-2.20	Stick-up
BH18	99.05	5.51	2.51-5.51	2.10-5.51	0.03-2.10	Stick-up
BH19	96.57	6.83	3.83-6.83	3.56-6.83	0.03-3.56	Stick-up
BH20	97.58	5.82	2.82-5.82	2.44-5.82	0.03-2.44	Stick-up

Table 3: Field Measurement of Water Quality Parameters - Feb.11, 2019

Parameter	BH2	BH3	BH8	BH11	BH13	BH17	BH20
Temperature (°C)	6.9	5.7	12.5	10.7	10.9	15.8	14.3
pH	6.73	7.56	8.14	7.58	6.65	7.01	7.60
Electrical Conductivity (µS/cm)	520	1,576	592	401	873	528	621

Table 4: Soil Samples Submitted for Analysis

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
2019 Phase II ESA Drilling and Surface Sampling Program									
BH1-AU1	0-0.60m; Sand/gravel Fill			X	X	X	X		Assessment of fill material within storage area (landscaping materials); sample selected based on visual observations and sample depth relative to potential source of impact.
BH2-AU1	0-0.60m; Sand/gravel Fill	X	X	X		X	X		Assessment of fill material and potential surficial impacts from ASTs; sample selected based on visual observations, vapour screening results and sample depth relative to potential source of impact.
BH3-AU1	0-0.60m; Sand/gravel Fill	X	X	X		X	X		Assessment of fill material and potential impacts in the immediate vicinity of the pesticide storage container adjacent to the Turf Building. Sample selected based on visual observations and sample depth relative to potential source of impact.
BH4-AU1	0-0.60m; Sand/gravel Fill			X	X	X	X		Assessment of fill material and potential impacts associated with Turf Building. Samples selected based on visual observations, vapour screening and sample depth relative to potential source of impact.
BH5-AU1/SS2	0.1-0.99m; Sand/gravel Fill	X	X		X				
BH6-AU1	0-0.15m; Silty Clay				X				**Parcel 1 – rough, east of 1st hole:** Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH8-AU1	0-0.60m; Reworked Native				X				**Parcel 1 – west edge of fairway at 7th hole:** Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH9-AU1	0-0.10m; Silty Clay				X				**Parcel 1 – rough, west of 2nd hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH10-AU1	0-0.25m; Reworked Native				X				**Parcel 2– rough, east of tee box at 3rd hole:** Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH12-AU1	0-0.15m; Reworked Native								**Parcel 2 – north edge of fairway at 4th hole:** Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH13-AU1	0-0.20m; Sandy fill				X				**Parcel** 1 **– west edge of fairway at 10th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH13-SS3	0.76-1.37m; Sand fill material			X		X	X		**Parcel 1 – west edge of fairway at 10th hole**: Assessment of sand fill material.
BH15-AU1	0-0.20m; Silty Clay				X				**Parcel 4 – rough, east of 12th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH16-SS4	1.52-2.13m; Silty Clay							X	Subsurface sample to confirm pH between 5 and 11.
BH17-AU1	0-0.20m; Reworked Native				X				**Parcel 4 – rough, west of 14th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
BH17-SS3	0.6-1.2m; Reworked Native							X	Surface sample to confirm pH between 5 and 9.
BH20-AU1	0-0.20m; Reworked Native				X				**Parcel 3 – rough, north of tee boxes at 13th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.

Table 4 Continued: Soil Samples Submitted for Analysis

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
HA1-G1	0.05-0.25m; Silty Clay			X		X	X		**Parcel 1 – rough, south of green at 3rd hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA3-G1	0.05-0.25m; Silty Clay				X				**Parcel 1 – rough, west of the 1st hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA5-G1	0.05-0.25m; Silty Clay			X		X	X		**Parcel 1 – fairway at 18th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA7-G1	0.05-0.25m; Silty Clay			X	X	X	X		**Parcel 1 – fairway at 11th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA11-G1	0.05-0.25m; Silty Clay				X				**Parcel 4 – fairway at 15th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA13-G1	0.05-0.25m; Silty Clay			X		X	X		**Parcel 4 – rough, east of tee box at 14th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA14-G1	0.05-0.25m; Silty Clay					X			**Parcel 3 – rough, west of 13th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA15-G1	0.05-0.25m; Silty Clay			X	X	X	X		**Parcel 3 – rough, east of 13th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA16-G1	0.05-0.25m; Silty Clay				X				**Parcel 2 – north edge of fairway at 5th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
DUP	0.05-0.25m; Silty Clay				X				Duplicate sample analysed for Quality Assurance and Quality Control purposes.
May, 2020 Supplemental Surface Sampling Program									
HA1A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – south edge of green at 1st hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA2B-20	0.15-0.30m; Silty Clay				X	X			**Parcel 1 – west edge of fairway at 2nd hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA3A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – north edge of green at 2nd hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA4A-20	0.05-0.15m; Silty Clay with Sand					X			**Parcel 2 – north edge of fairway at 3rd hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA5B-20	0.15-0.30m; Silty Clay with Sand				X	X			**Parcel 2 – north edge of green at 4th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.

Table 4 Continued: Soil Samples Submitted for Analysis

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
HA6A-20	0.05-0.15m; Silty Clay with Sand				X	X			**Parcel 2 – south edge of green at 5th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA7A-20	0.05-0.15m; Silty Clay with Sand				X	X			**Parcel 1 – south edge of tee box at 6th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA8B-20	0.15-0.30m; Silty Clay				X	X			**Parcel 1 – east end of fairway at 6th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA9A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – south edge of green at 7th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA10B-20	0.15-0.30m; Silty Clay				X	X			**Parcel 1 – south edge of green at 8th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA11A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – north edge of tee box at 9th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA12A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – north edge of green at 9th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA13A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – north edge of green at 18th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA14B-20	0.15-0.30m; Silty Clay				X	X			**Parcel 1 – fairway at 18th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA15A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – fairway at 10th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA16B-20	0.15-0.30m; Silty Clay				X	X			**Parcel 1 – fairway at 17th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA17A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 1 – west edge of green at 11th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA18A-20	0.05-0.15m; Silty Clay					X			**Parcel 4 – north edge of green at 16th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA19A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 4 – east edge of green at 15th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.

Table 4 Continued: Soil Samples Submitted

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
HA20A-20	0.05-0.15m; Silty Clay					X			**Parcel 1 – fairway at 15th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA21B-20	0.15-0.30m; Silty Clay				X				**Parcel 1 – fairway at 14th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA22	0.30-0.60m; Silty Clay				X				**Parcel 3 – rough, south side of 13th hole**: Vertical delineation of Hg impacts identified at HA14 (0.05-0.25m) during 2019 field program. Sample collected from below depth of 0.05-0.25m.
HA23A-20	0.05-0.15m; Silty Clay				X				**Parcel 3 – rough, south side of 13th hole**: Lateral delineation of Hg impacted soil (HA14, 2019). Samples collected at depths within range of impacted sample HA14-G1.
HA24B-20	0.15-0.30m; Silty Clay				X				
HA25A-20	0.05-0.15m; Silty Clay				X	X			
HA26A-20	0.05-0.15m; Silty Clay				X				
HA27-20	0.30-0.60m; Silty Clay				X	X			**Parcel 3 – rough, north of 13th hole**: Vertical delineation of Hg impacts identified at HA15 (0.05-0.25m) during 2019 field program. Sample collected from below depth of 0.05-0.25m.
HA28A-20	0.05-0.15m; Silty Clay					X			**Parcel 3 – rough, north of 13th hole**: Lateral delineation of Hg impacted soil (HA15, 2019). Samples collected at depths within range of impacted sample HA15-G1.
HA29B-20	0.05-0.15m; Silty Clay					X			
HA30A-20	0.05-0.15m; Silty Clay					X			
HA31B-20	0.05-0.15m; Silty Clay					X			
HA32A-20	0.05-0.15m; Silty Clay				X	X			**Parcel 4 – east edge of green at 12th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA33B-20	0.15-0.30m; Silty Clay					X			**Parcel 4 – fairway at 12th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
HA34A-20	0.15-0.30m; Silty Clay				X	X			**Parcel 4 – fairway at 12th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Shallow sample collected from beneath grass root zone due to surficial nature of pesticide/herbicide application.
December 2020 Supplemental Surface Soil Sampling									
HA35A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough, 2nd hole**: Lateral delineation of Hg impacted soil identified at HA3-20. Sample collected from depth at which Hg was identified at HA3-20 (and other locations across the site).
HA36A-20	0.05-0.30m; Silty Clay					X			
HA36C-20	0.05-0.30m; Silty Clay					X			Duplicate of Sample HA36A-20 for QA/QC purposes.
HA37A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough, north of 18th hole**: lateral delineation of Hg impacted soil identified at HA13-20. Sample collected from depth at which Hg was identified at HA13-20 (and other locations across the site).
HA38B-20	0.30-0.60m; Silty Clay					X			**Parcel 1 – north edge of green at 18th hole:** vertical delineation of Hg impacted soil identified at HA13-20. Sample collected from below depth of impacted sample (0.05-0.15m).
HA38C-20	0.30-0.60m; Silty Clay					X			Duplicate of Sample HA38B-20 for QA/QC purposes.
HA39A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough, north of 18th hole**: lateral delineation of Hg impacted soil identified at HA13-20. Sample collected from depth at which Hg was identified at HA13-20 (and other locations across the site).
HA40B-20	0.30-0.60m; Silty Clay					X			**Parcel 1 – west edge of green at 11th hole**: vertical delineation of Hg impacted soil identified at HA17-20. Sample collected from below depth of impacted soil (0.05-0.15m).

Table 4 Continued: Soil Samples Submitted

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
HA40C-20	0.30-0.60m; Silty Clay					X			Duplicate of Sample HA40B-20 for QA/QC purposes.
HA41A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough, west of 11th hole**: lateral delineation of Hg impacted soil identified at HA17-20. Sample collected from depth at which Hg was identified at HA17-20 (0.05-0.15m).
HA42A-20	0.05-0.30m; Silty Clay					X			**Parcel 4 – rough west of 16th hole:** lateral delineation of Hg impacted soil identified at HA18-20. Sample collected from depth at which Hg was identified at HA18-20 (0.05-0.15m).
HA43A-20	0.05-0.30m; Silty Clay					X			**Parcel 4 – rough, west of 15th hole**: lateral delineation of Hg impacted soil identified at HA19-20. Sample collected from depth at which Hg was identified at HA19-20 (0.05-0.15m).
HA43C-20	0.05-0.30m; Silty Clay					X			Duplicate of HA43A-20 for QA/QC purposes.
HA44A-20	0.05-0.30m; Silty Clay					X			**Parcel 3 – rough, northwest of 13th hole**: lateral delineation of Hg impacted soil identified at HA14. Sample collected from depth interval of impacted at HA25-20 (0.05-0.15m).
HA44C-20	0.05-0.30m; Silty Clay					X			Duplicate of HA44A-20 for QA/QC purposes.
HA45A-20	0.05-0.30m; Silty Clay					X			**Parcel 3 – rough, east of 13th hole**: lateral delineation of Hg impacted soil identified at HA25-20. Sample collected from depth interval of impact at HA14 (0.05-0.15m).
HA46A-20	0.05-0.30m; Silty Clay					X			**Parcel 3 – rough, west of 13th hole**: lateral delineation of Hg impacted soil identified at HA15 and HA25-20. Sample collected from depth interval of impact (0.05-0.30m).
HA46B-20	0.30-0.60m; Silty Clay					X			**Parcel 3 – rough, west of 13th hole**: vertical delineation of Hg impacted soil identified at HA15 and HA25-20. Sample collected from deeper interval below impact.
HA46C-20	0.30-0.60m; Silty Clay					X			Duplicate of HA46B-20 for QA/QC purposes.
HA47A-20	0.05-0.30m; Silty Clay					X			**Parcel 4 – rough, east of 12th hole**: lateral delineation of Hg impacted soil identified at HA32-20. Sample collected from depth interval of impact at HA32-20 (0.05-0.15m).
HA48A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – rough, east of 5th hole**: lateral delineation of Hg impacted soil identified at HA6-20. Sample collected from depth interval of impact at HA6-20 (0.05-0.15m).
HA49A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – rough, north of 5th hole**: lateral delineation of Hg impacted soil identified at HA6-20. Sample collected from depth interval of impact at HA6-20 (0.05-0.15m).
HA50A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – rough, west of 5th hole**: lateral delineation of Hg impacted soil identified at HA6-20. Sample collected from depth interval of impact at HA6-20 (0.05-0.15m).
HA51A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough northwest of 6th hole**: lateral delineation of Hg impacted soil identified at HA7-20. Sample collected from depth interval of impact at HA7-20 (0.05-0.15m).
HA51B-20	0.30-0.60m; Silty Clay					X			**Parcel 1 – rough northwest of 6th hole**: vertical delineation of Hg impacted soil identified at HA7-20. Sample collected from deeper interval below previously identified impact.
HA52A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – fairway 6th hole**: lateral delineation of Hg impacted soil identified at HA6-20. Sample collected from depth interval of impact at HA7-20 (0.05-0.15m).
HA53A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – fairway 5th hole**: lateral delineation of Hg impacted soil identified at HA5-20 and HA6-20. Sample collected from depth interval of impacts (0.05-0.30m).
HA54A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – rough, east of 4th hole**: lateral delineation of Hg impacted soil identified at HA5-20. Sample collected from depth interval of impact (0.15-0.30m).
HA55B-20	0.30-0.60m; Silty Clay					X			**Parcel 2 – north edge of green at 4th hole**: vertical delineation of Hg impacted soil identified at HA5-20. Sample collected from depth interval below previously identified impact.
HA55C-20	0.30-0.60m; Silty Clay					X			Duplicate of HA55B-20 for QA/QC purposes.

Table 4 Continued: Soil Samples Submitted

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed							Sample Location and Rationale
		BTEX	PHCs (F_1-F_4)	Metals	OC Pesticides	Hg	CrVI	pH	
HA56A-20	0.05-0.30m; Silty Clay					X			**Parcel 2 – rough, west of 4th hole**: lateral delineation of Hg impacted soil identified at HA5-20. Sample collected from depth interval of impacts (0.15-0.30m).
HA57B-20	0.30-0.60m; Silty Clay					X			**Parcel 4 – south edge of fairway at 12th hole**: Assessment of potential impacts resulting from the use of pesticides/herbicides. Supplemental confirmation of soil quality at depth below interval at which impacts have been identified.
HA58A-20	0.05-0.30m; Silty Clay					X			**Parcel 1 – rough, southwest of 7th hole**: lateral delineation of Hg impacted soil identified at HA9-20. Sample collected from depth interval of impact (0.05-0.15m).

Table 5: Groundwater Samples Submitted for Analysis

Sample ID	Sample Depth/ Stratigraphic Unit	Parameters Analyzed					Rationale
		BTEX	PHCs (F1-F4)	OC Pesticides	Metals	Mercury	
BH2-GW1	3.40-6.40m; Bedrock	X	X				To investigate potential groundwater impacts resulting from the ASTs.
BH3-GW1	3.83-6.83m; Bedrock	X	X	X			To investigate potential groundwater impacts in the vicinity of the Turf Building and pesticide storage.
BH8-GW1	3.91-6.91m; Silty Clay			X			To confirm that groundwater has not been impacted although no evidence of soil impacts based on available data.
BH8-GW2					X	X	
BH11-GW1	4.57-7.57m; Glacial Till			X			
BH13-GW1	4.72-7.72m; Silty Clay			X			
BH15-GW1	5.15-8.15; Silty Clay			X			
BH16-GW1	2.84-5.82; Silty Clay				X	X	
BH17-GW1	2.51-5.51m; Bedrock			X			
BH18-GW1	2.51-5.51m; Bedrock				X	X	To confirm that groundwater has not been impacted by pesticide/herbicide use based on mercury exceedance in surface soils.
BH19-GW1	3.83-6.83m; Bedrock				X	X	
BH20-GW1	2.82-5.82m; Bedrock			X		X	
BH20-GW2					X	X	
DUP-GW	3.40-6.40m; Bedrock	X	X				QA/QC

Table 6: Groundwater Level Measurements

Borehole Location	Ground Surface Elevation (m)	Water Level Depth (m below grade)	Water Level Elevation (m ASL)	Date of Measurement
BH2	105.20	2.38	102.82	April 29, 2019
BH3	105.72	3.35	102.37	April 29, 2019
BH8	98.21	1.21	97.00	April 29, 2019
BH10	100.61	1.75	98.86	April 29, 2019
BH11	94.64	0.15	94.49	April 30, 2019
BH12	95.64	1.46	94.18	April 30, 2019
BH13	102.84	1.38	101.46	April 29, 2019
BH15	99.08	0.12	98.96	April 29, 2019
BH16	97.31	0.11	97.20	April 30, 2019
BH17	97.15	0.10	97.05	April 29, 2019
BH18	99.05	2.90	96.15	April 30, 2019
BH19	96.57	0.39	96.18	April 30, 2019
BH20	97.58	1.21	96.37	April 30, 2019
BH2	105.20	2.83	102.37	May 5, 2019
BH8	98.21	1.29	96.92	May 5, 2019
BH10	100.61	2.19	98.42	May 5, 2019
BH11	94.64	0.28	94.36	May 5, 2019
BH13	102.84	1.40	101.44	May 5, 2019
BH15	99.08	0.32	98.76	May 5, 2019
BH16	97.31	0.08	97.23	May 5, 2019
BH18	99.05	2.94	96.11	May 5, 2019
BH19	96.57	0.49	96.08	May 5, 2019
BH20	97.58	1.92	95.66	May 5, 2019

Table 7: Grain Size Analysis

Sample ID	Depth (m BGS)	%Gravel	%Sand	%Silt and Clay	Soil Type
BH6-19-SS4	1.52-2.13	0.0	6.6	93.4	Clay
BH11-19-SS4	1.52-2.13	0.0	1.7	98.3	Silt
BH14-19-SS4	1.52-2.13	0.0	11.2	88.8	Clay
BH15-19-SS4	1.52-2.13	0.0	1.8	98.2	Clay

Table 8: Parcel 1 - 2019 Analytical Test Results
Soil - BTEX and PHCs (F_1-F_4)

Parameter	MDL (µg/g)	Soil Samples (µg/g)			MECP Table 3 Residential Standards (µg/g)
		Feb.27/19	Feb.26/19	Feb.27/19	
		BH2-AU1 (0-0.6m)	BH3-AU1 (0-0.6m)	BH5-AU1/SS2 (0-0.99m)	
Benzene	0.02	nd	nd	nd	0.21
Ethylbenzene	0.05	nd	nd	nd	2
Toluene	0.05	nd	nd	nd	2.3
Xylenes (Total)	0.05	nd	nd	nd	3.1
PHC F1	7	nd	nd	nd	55
PHC F2	4	14	nd	nd	98
PHC F3	8	47	47	nd	300
PHC F4	6	26	149	nd	2,800
PHC F4G	50	nt	443[1]	nt	

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nt – not tested for this parameter
- 1 – GC-FID signal did not return to baseline by C50

Table 9A: Parcel 1 – 2019 Analytical Test Results
Soil – Metals (including As, Sb, Se), Hg, CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g)								
		Feb. 27, 2019		Feb. 26, 2019	Feb. 27, 2019	Mar. 6, 2019	Apr.29, 2019			MECP Table 3 Residential Standards (µg/g)
		BH1-AU1 (0-0.6m)	BH2-AU1 (0-0.6m)	BH3-AU1 (0-0.6m)	BH4-AU1 (0-0.6m)	BH13-SS3 (0.76-1.37)	HA5-G1 (0.05-0.25m)	HA7-G1 (0.05-0.25m)	DUP (0.05-0.25m)	
Antimony	1.0	nd	nd	nd	nd	nd	nd	nd	nd	7.5
Arsenic	1.0	2.4	1.2	1.1	2.4	1.2	1.1	1.9	1.4	18
Barium	1.0	126	156	107	260	36.4	45.9	85.7	92.7	390
Beryllium	0.5	0.8	nd	nd	0.6	nd	nd	nd	nd	4
Boron	5.0	6.2	9.1	8.0	7.3	nd	nd	nd	nd	120
Cadmium	0.5	nd	nd	nd	nd	nd	nd	nd	nd	1.2
Chromium	5.0	97.2	23.2	20.6	47.1	12.2	14.5	22.3	23.8	160
Chromium (VI)	0.2	nd	nd	nd	nd	nd	nd	nd	nt	8
Cobalt	1.0	10.4	4.4	3.4	9.7	3.9	3.9	5.9	5.8	22
Copper	5.0	11.2	6.4	6.0	18.1	9.7	9.3	13.6	12.7	140
Lead	1.0	4.1	5.2	3.9	7.9	1.9	3.3	5.1	3.5	120
Mercury	0.1	nd	0.2	nd	0.1	nd	nd	nd	nt	0.27
Molybdenum	1.0	nd	nd	nd	nd	nd	nd	nd	nd	6.9
Nickel	5.0	30.9	11.4	8.6	21.5	6.6	7.5	13.0	12.3	100
Selenium	1.0	nd	nd	nd	nd	nd	nd	nd	nd	2.4
Silver	0.3	nd	nd	nd	nd	nd	nd	nd	nd	20
Thallium	1.0	nd	nd	nd	nd	nd	nd	nd	nd	1
Uranium	1.0	nd	nd	nd	nd	nd	nd	nd	nd	23
Vanadium	10.0	49.0	19.5	12.2	45.6	24.2	26.6	30.5	34.5	86
Zinc	20.0	52.4	20.3	nd	69.9	nd	25.3	39.4	37.4	340

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 9B: Parcel 1 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) (May 4, 2020)													
		HA2B-20 (0.15-0.30m)	HA3A-20 (0.05-0.15m)	HA7A-20 (0.05-0.15m)	HA8B-20 (0.15-0.30m)	HA9A-20 (0.05-0.15m)	HA10B-20 (0.15-0.30m)	HA11A-20 (0.05-0.15m)	HA12A-20 (0.05-0.15m)	HA13A-20 (0.05-0.15m)	HA14B-20 (0.15-0.30m)	HA15A-20 (0.05-0.150m)	HA16B-20 (0.15-0.30m)	HA17A-20 (0.05-0.150m)	MECP Table 3 Residential Standards (µg/g)
Mercury	0.1	nd	**2.5**	**0.5**	nd	**2.7**	nd	nd	**1.7**	**0.9**	nd	nd	nd	**0.8**	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **bold** – exceeds MECP Table 3 standard

Table 9B Continued: Parcel 1 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) (December 9-11, 2020)													
		HA35A-20 (0.05-0.30m)	HA36A-20 (0.05-0.30m)	HA37-20 (0.05-0.30m)	HA38B-20 (0.30-0.60m)	HA38C-20 (0.30-0.60m)	HA39A-20 (0.05-0.30m)	HA40B-20 (0.30-0.60m)	HA40C-20 (0.30-0.60m)	HA41A-20 (0.05-0.30m)	HA51A-20 (0.05-0.30m)	HA51B-20 (0.30-0.60m)	HA52A-20 (0.05-0.30m)	HA58A-20 (0.05-0.30m)	MECP Table 3 Residential Standards (µg/g)
Mercury	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **bold** – exceeds MECP Table 3 standard

Table 10A: Parcel 1 - 2019 Analytical Test Results
Soil - Organochlorine Pesticides (OCPs)

Parameter	Soil Samples (µg/g)														MECP Table 3 Residential Standards (µg/g)
	Feb.26/19				Feb.25/19		Feb.27/19		Mar.6/19		Apr.30/19		Apr.29/19		
	BH3-AU1 (0-0.6m)		BH6-AU1 (0-0.15m)		BH8-AU1 (0-0.1m)		BH9-AU1 (0-0.1m)		BH13-AU1 (0-0.2m)		HA3-G1 (0.05-0.25m)		HA7-G1 (0.05-0.25m)		
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	MDL (µg/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
2-4'-DDE	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
2-4'-DDT	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
4,4'-DDE	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
4,4'-DDT	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Aldrin	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.05
DDD (total)	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	3.3
DDE (total)	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.26
DDT (total)	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	1.4
Dieldrin	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.05
Endosulfan I	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Endosulfan I + II	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.04
Endosulfan II	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Endosulfan sulfate	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Endrin	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.04
Endrin aldehyde	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Heptachlor	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.15
Heptachlor epoxide	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.05
Hexachlorobenzene	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.52
Hexachlorobutadiene	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.012
Hexachloroethane	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.089
Methoxychlor	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.13
Mirex	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
Oxychlordane	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
β-BHC	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
α-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
α + γ-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.05
α-BHC	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
γ-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	nv
γ-BHC (Lindane)	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	nd	0.01	nd	0.056
δ-BHC	0.01	nd	0.009	nd	0.009	nd	0.01	nd	0.009	nd	0.01	0.01	0.01	nd	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 10B: Parcel 1 - 2020 Analytical Test Results
Soil - Organochlorine Pesticides (OCPs)

Parameter	Soil Samples (µg/g) – Mar. 4, 2020														
	HA1-20 (0.05-0.15m)		HA3A-20 (0.05-0.15m)		HA7A-20 (0.05-0.15m)		HA8B-20 (0.15-0.30m)		HA9A-20 (0.05-0.15m)		HA10B-20 (0.15-0.30m)		HA11A-20 (0.05-0.15m)		MECP Table 3 Residential Standards (µg/g)
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	MDL (µg/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
2-4'-DDE	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
2-4'-DDT	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
4,4'-DDE	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
4,4'-DDT	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Aldrin	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.05
DDD (total)	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	3.3
DDE (total)	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.26
DDT (total)	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	1.4
Dieldrin	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.05
Endosulfan I	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Endosulfan I + II	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.04
Endosulfan II	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Endosulfan sulfate	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Endrin	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.04
Endrin aldehyde	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Heptachlor	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.15
Heptachlor epoxide	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.05
Hexachlorobenzene	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.52
Hexachlorobutadiene	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.012
Hexachloroethane	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.089
Methoxychlor	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.13
Mirex	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
Oxychlordane	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
β-BHC	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
α-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
α + γ-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.05
α-BHC	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
γ-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	nv
γ-BHC (Lindane)	0.008	nd	0.009	nd	0.007	nd	0.009	nd	0.007	nd	0.009	nd	0.008	nd	0.056
δ-BHC	0.008	0.053	0.009	0.057	0.007	0.052	0.009	0.051	0.007	0.055	0.009	0.011	0.008	0.040	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 10B Continued: Parcel 1 - 2020 Analytical Test Results
Soil - Organochlorine Pesticides (OCP)

Parameter	Soil Samples (µg/g) – May 4, 2020												
	HA12A-20 (0.05-0.15m)		HA13A-20 (0.05-0.15m)		HA14B-20 (0.15-0.30m)		HA15A-20 (0.05-0.150m)		HA16B-20 (0.15-0.30m)		HA17A-20 (0.05-0.150m)		MECP Table 3 Residential Standards (µg/g)
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
2-4'-DDE	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
2-4'-DDT	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
4,4'-DDE	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
4,4'-DDT	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Aldrin	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.05
DDD (total)	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	3.3
DDE (total)	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.26
DDT (total)	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	1.4
Dieldrin	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.05
Endosulfan I	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Endosulfan I + II	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.04
Endosulfan II	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Endosulfan sulfate	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Endrin	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.04
Endrin aldehyde	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Heptachlor	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.15
Heptachlor epoxide	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.05
Hexachlorobenzene	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.52
Hexachlorobutadiene	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.012
Hexachloroethane	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.089
Methoxychlor	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.13
Mirex	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
Oxychlordane	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
β-BHC	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
α-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
α + γ-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.05
α-BHC	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
γ-Chlordane	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	nv
γ-BHC (Lindane)	0.008	nd	0.009	nd	0.007	nd	0.007	nd	0.007	nd	0.008	nd	0.056
δ-BHC	0.008	0.086	0.009	0.033	0.007	0.021	0.007	0.053	0.007	0.043	0.008	0.046	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 11A: Parcel 2 – 2019 Analytical Test Results
Soil – Metals (including As, Sb, Se), Hg and CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g) - Apr.30/19	MECP Table 3 Residential Standards (µg/g)
		HA1-G1 (0.05-0.25m)	
Antimony	1.0	nd	7.5
Arsenic	1.0	2.2	18
Barium	1.0	129	390
Beryllium	0.5	nd	4
Boron	5.0	nd	120
Cadmium	0.5	nd	1.2
Chromium	5.0	37.7	160
Chromium (VI)	0.2	nd	8
Cobalt	1.0	8.6	22
Copper	5.0	14.2	140
Lead	1.0	9.2	120
Mercury	0.1	nd	0.27
Molybdenum	1.0	nd	6.9
Nickel	5.0	19.1	100
Selenium	1.0	nd	2.4
Silver	0.3	nd	20
Thallium	1.0	nd	1
Uranium	1.0	nd	23
Vanadium	10.0	46.1	86
Zinc	20.0	76.4	340

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 11B: Parcel 2 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g)											
		May 4, 2019							December 9-11, 2020				
		HA4A-20 (0.05-0.15m)	HA5B-20 (0.15-0.30m)	HA6A-20 (0.05-0.15m)	HA48A-20 (0.05-0.30m)	HA49A-20 (0.05-0.30m)	HA50A-20 (0.05-0.30m)	HA53A-20 (0.05-0.30m)	HA54A-20 (0.05-0.30m)	HA55B-20 (0.30-0.60m)	HA55C-20 (0.30-0.60m)	HA56A-20 (0.05-0.30m)	MECP Table 3 Residential Standards (µg/g)
Mercury	0.1	0.1	**0.4**	**1.9**	nd	nd	nd	nd	nd	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **bold** – exceeds MECP Table 3 standard

Table 12: Parcel 2 – 2019/2020 Analytical Test Results
Soil - Organochlorine Pesticides (OCP)

Parameter	Soil Samples (µg/g)										MECP Table 3 Residential Standards (µg/g)
	Feb.28, 2019				May 4, 2020						
	BH10-AU1 (0-0.25m)		BH12-AU1 (0-0.15m)		HA16-G1 (0.05-0.25m)		HA5B-20 (0.15-0.30m)		HA6A-20 (0.05-0.15m)		
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	MDL (µg/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
2-4'-DDE	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
2-4'-DDT	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
4,4'-DDE	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
4,4'-DDT	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Aldrin	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.05
DDD (total)	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	3.3
DDE (total)	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.26
DDT (total)	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	1.4
Dieldrin	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.05
Endosulfan I	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Endosulfan I + II	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.04
Endosulfan II	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Endosulfan sulfate	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Endrin	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.04
Endrin aldehyde	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Heptachlor	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.15
Heptachlor epoxide	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.05
Hexachlorobenzene	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.52
Hexachlorobutadiene	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.012
Hexachloroethane	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.089
Methoxychlor	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.13
Mirex	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
Oxychlordane	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
β-BHC	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
α-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
α + γ-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.05
α-BHC	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
γ-Chlordane	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	nv
γ-BHC (Lindane)	0.01	nd	0.009	nd	0.009	nd	0.009	nd	0.009	nd	0.056
δ-BHC	0.01	nd	0.009	nd	0.009	nd	0.009	0.044	0.009	0.056	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 13A: Parcel 3 – 2019 Analytical Test Results
Soil – Metals (including As, Sb, Se), Hg and CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g) - Apr.30/19		MECP Table 7 Residential Standards (µg/g)
		HA14-G1 (0.05-0.25m)	HA15-G1 (0.05-0.25m)	
Antimony	1.0	nt	nd	7.5
Arsenic	1.0	nt	nd	18
Barium	1.0	nt	25.7	390
Beryllium	0.5	nt	nd	4
Boron	5.0	nt	nd	120
Cadmium	0.5	nt	nd	1.2
Chromium	5.0	nt	12.3	160
Chromium (VI)	0.2	nt	nd	8
Cobalt	1.0	nt	2.7	22
Copper	5.0	nt	5.6	140
Lead	1.0	nt	1.2	120
Mercury	0.1	**0.6**	**2.3**	0.27
Molybdenum	1.0	nt	nd	6.9
Nickel	5.0	nt	6.6	100
Selenium	1.0	nt	nd	2.4
Silver	0.3	nt	nd	20
Thallium	1.0	nt	nd	1
Uranium	1.0	nt	nd	23
Vanadium	10.0	nt	12.0	86
Zinc	20.0	nt	25.1	340

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nt – not tested for this parameter
- **bold** – exceeds MECP Table 7 standard

Table 13B: Parcel 3 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) – May 4, 2019									
		HA22-20* (0.30-0.60m)	HA23A-20 (0.05-0.15m)	HA23B-20 (0.15-0.30m)	HA24A-20 (0.05-0.15m)	HA24B-20 (0.15-0.30m)	HA25A-20 (0.05-0.15m)	HA25B-20 (0.15-0.30m)	HA26A-20 (0.05-0.15m)	HA26B-20 (0.15-0.30m)	MECP Table 7 Residential Standards (µg/g)
Mercury	0.1	nd	nd	nd	nd	nd	**1.7**	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- * - HA22 was taken at the same location as HA14
- **bold** – exceeds MECP Table 7 standard

Table 13B Continued: Parcel 3 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) – May 4, 2019									
		HA27-20* (0.30-0.60m)	HA28A-20 (0.05-0.15m)	HA28B-20 (0.15-0.30m)	HA29A-20 (0.05-0.15m)	HA29B-20 (0.15-0.30m)	HA30A-20 (0.05-0.15m)	HA30B-20 (0.15-0.30m)	HA31A-20 (0.05-0.15m)	HA31B-20 (0.15-0.30m)	MECP Table 7 Residential Standards (µg/g)
Mercury	0.1	0.2	nd	**1.0**	0.2	nd	nd	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- *HA27 was taken at the same location as HA15
- **bold** – exceeds MECP Table 7 standard

Table 13B Continued: Parcel 3 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) – December 9, 2020						
		HA44A-20 (0.05-0.30m)	HA44C-20 (0.05-0.30m)	HA45A-20 (0.05-0.30m)	HA46A-20 (0.05-0.30m)	HA46B-20 (0.30-0.60m)	HA46C-20 (0.30-0.60m)	MECP Table 7 Residential Standards (µg/g)
Mercury	0.1	nd	nd	nd	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- **bold** – exceeds MECP Table 7 standard

Table 14: Parcel 3 – 2019/2020 Analytical Test Results
Soil - Organochlorine Pesticides (OCP)

Parameter	Soil Samples (µg/g)						MECP Table 7 Residential Standards (µg/g)
	March 11, 2019		April 30, 2019		May 4, 2020		
	BH20-AU1 (0-0.2m)		HA15-G1 (0.05-0.25m)		HA25A (0.05-0.15m)		
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	MDL (µg/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.01	nd	0.01	nd	0.008	nd	nv
2-4'-DDE	0.01	nd	0.01	nd	0.008	nd	nv
2-4'-DDT	0.01	nd	0.01	nd	0.008	nd	nv
4,4'-DDE	0.01	nd	0.01	nd	0.008	nd	nv
4,4'-DDT	0.01	nd	0.01	nd	0.008	nd	nv
Aldrin	0.01	nd	0.01	nd	0.008	nd	0.05
DDD (total)	0.01	nd	0.01	nd	0.008	nd	3.3
DDE (total)	0.01	nd	0.01	nd	0.008	nd	0.26
DDT (total)	0.01	nd	0.01	nd	0.008	nd	1.4
Dieldrin	0.01	nd	0.01	nd	0.008	nd	0.05
Endosulfan I	0.01	nd	0.01	nd	0.008	nd	nv
Endosulfan I + II	0.01	nd	0.01	nd	0.008	nd	0.04
Endosulfan II	0.01	nd	0.01	nd	0.008	nd	nv
Endosulfan sulfate	0.01	nd	0.01	nd	0.008	nd	nv
Endrin	0.01	nd	0.01	nd	0.008	nd	0.04
Endrin aldehyde	0.01	nd	0.01	nd	0.008	nd	nv
Heptachlor	0.01	nd	0.01	nd	0.008	nd	0.15
Heptachlor epoxide	0.01	nd	0.01	nd	0.008	nd	0.05
Hexachlorobenzene	0.01	nd	0.01	nd	0.008	nd	0.52
Hexachlorobutadiene	0.01	nd	0.01	nd	0.008	nd	0.012
Hexachloroethane	0.01	nd	0.01	nd	0.008	nd	0.089
Methoxychlor	0.01	nd	0.01	nd	0.008	nd	0.13
Mirex	0.01	nd	0.01	nd	0.008	nd	nv
Oxychlordane	0.01	nd	0.01	nd	0.008	nd	nv
β-BHC	0.01	nd	0.01	nd	0.008	nd	nv
α-Chlordane	0.01	nd	0.01	nd	0.008	nd	nv
α + γ-Chlordane	0.01	nd	0.01	nd	0.008	nd	0.05
α-BHC	0.01	nd	0.01	nd	0.008	nd	nv
γ-Chlordane	0.01	nd	0.01	nd	0.008	nd	nv
γ-BHC (Lindane)	0.01	nd	0.01	nd	0.008	nd	0.056
δ-BHC	0.01	nd	0.01	0.02	0.008	0.067	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 15A: Parcel 4 – 2019 Analytical Test Results
Soil – Metals (including As, Sb, Se), Hg and CrVI

Parameter	MDL (µg/g)	Soil Samples (µg/g) - Apr.30/19	MECP Table 7 Residential Standards (µg/g)
		HA13-G1 (0.05-0.25m)	
Antimony	1.0	nd	nv
Arsenic	1.0	2.3	nv
Barium	1.0	232	nv
Beryllium	0.5	0.7	nv
Boron	5.0	nd	nv
Cadmium	0.5	nd	0.05
Chromium	5.0	48.0	3.3
Chromium (VI)	0.2	nd	0.26
Cobalt	1.0	10.7	1.4
Copper	5.0	20.9	0.05
Lead	1.0	7.7	nv
Mercury	0.1	nd	0.04
Molybdenum	1.0	nd	nv
Nickel	5.0	24.4	nv
Selenium	1.0	nd	0.04
Silver	0.3	nd	nv
Thallium	1.0	nd	0.15
Uranium	1.0	nd	0.05
Vanadium	10.0	58.2	0.52
Zinc	20.0	86.2	0.012

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nt – not tested for this parameter

Table 15B: Parcel 4 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) – May 4, 2020						
		HA18A-20* (0.05-0.15m)	HA19A-20 (0.05-0.15m)	HA20A-20 (0.05-0.15m)	HA32A-20 (0.05-0.15m)	HA33B-20 (0.15-0.30m)	HA34A-20 (0.05-0.15m)	MECP Table 7 Residential Standards (µg/g)
Mercury	0.1	**0.5**	**2.0**	0.1	**2.6**	0.1	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 15B Continued: Parcel 4 – 2020 Analytical Test Results
Soil – Mercury (Hg)

Parameter	MDL (µg/g)	Soil Samples (µg/g) – December 9-11, 2020						
		HA42A-20* (0.05-0.30m)	HA43A-20 (0.05-0.30m)	HA43C-20 (0.05-0.30m)	HA47A-20 (0.05-0.30m)	HA57A-20 (0.05-0.30m)	HA57B-20 (0.30-0.60m)	MECP Table 7 Residential Standards (µg/g)
Mercury	0.1	nd	nd	nd	nd	nd	nd	0.27

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 16: Parcel 4 – 2019/2020 Analytical Test Results
Soil - Organochlorine Pesticides (OCP)

Parameter	Soil Samples (µg/g)												MECP Table 7 Residential Standards (µg/g)
	Mar.8/19			Mar.13/19			Apr.30/19			May 4, 2020			
	BH15-AU1 (0-0.20m)		BH17-AU1 (0-0.20m)		HA11-G1 (0.05-0.25m)		HA19A-20 (0.05-0.15m)		HA32A-20 (0.05-0.15m)		HA34A-20 (0.05-0.15m)		
	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	MDL (µg/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	MDL (µg/g)	Result (ug/g)	
2-4'-DDD	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
2-4'-DDE	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
2-4'-DDT	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
4,4'-DDE	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
4,4'-DDT	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Aldrin	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.05
DDD (total)	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	3.3
DDE (total)	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.26
DDT (total)	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	1.4
Dieldrin	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.05
Endosulfan I	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Endosulfan I + II	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.04
Endosulfan II	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Endosulfan sulfate	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Endrin	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.04
Endrin aldehyde	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Heptachlor	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.15
Heptachlor epoxide	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.05
Hexachlorobenzene	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.52
Hexachlorobutadiene	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.012
Hexachloroethane	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.089
Methoxychlor	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.13
Mirex	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
Oxychlordane	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
β-BHC	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
α-Chlordane	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
α + γ-Chlordane	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.05
α-BHC	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
γ-Chlordane	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	nv
γ-BHC (Lindane)	0.008	nd	0.01	nd	0.01	nd	0.007	nd	0.008	nd	0.09	nd	0.056
δ-BHC	0.008	nd	0.01	nd	0.01	0.03	0.007	0.047	0.008	0.082	0.09	0.097	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 17: Maximum Soil Concentrations

Parameter	Maximum Concentration (µg/g)	Borehole	Depth Interval (m BGS)
Petroleum Hydrocarbons			
PHC F_2	14	BH2-AU1	0-0.6
PHC F_3	47	BH2-AU1 BH3-AU1	0-0.6
PHC F_4	443	BH3-AU1	0-0.6
Metals			
Arsenic	2.4	BH1-AU1 BH4-AU1	0-0.6
Barium	260	BH4-AU1	0-0.6
Beryllium	0.8	BH1-AU1	0-0.6
Boron	9.1	BH2-AU1	0-0.6
Chromium	97.2	BH1-AU1	0-0.6
Cobalt	10.7	HA13-G1	0.05-0.25
Copper	20.9	HA13-G1	0.05-0.25
Lead	9.2	HA1-G1	0.05-0.25
Mercury	**2.6**	HA32A-20	0.05-0.15
Nickel	30.9	BH1-AU1	0-0.6
Vanadium	58.2	HA13-G1	0.05-0.25
Zinc	86.2	HA13-G1	0.05-0.25
Organochlorine Pesticides			
δ-BHC	0.097	HA34A-20	0.05-0.15

Notes:
- **bold** – exceeds applicable MECP standard

Table 18: Parcel 1 - Analytical Test Results
Groundwater - BTEX and PHCs (F_1-F_4)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 3 Standards (µg/L)
		May 17/19	Mar.22/19	May 17/19	
		BH2-GW1 (3.40-6.40m)	BH3-GW1 (3.83-6.83m)	DUP-GW	
Benzene	0.5	nd	nd	nd	5
Ethylbenzene	0.5	nd	nd	nd	2.4
Toluene	0.5	nd	nd	nd	22
Xylenes (Total)	0.5	nd	nd	nd	300
PHC F1	25	nd	nd	nd	420
PHC F2	100	nd	nd	nd	150
PHC F3	100	nd	nd	nd	500
PHC F4	100	nd	nd	nd	500

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 19: Parcel 1 - Analytical Test Results
Groundwater - Metals (including As, Sb, Se) and Hg

Parameter	MDL (µg/L)	Groundwater Sample (µg/L) - May 5, 2020	MECP Table 3 Residential Standards (µg/L)
		BH8-GW2 (3.91-6.91m)	
Mercury	0.1	nd	0.29
Antimony	0.5	nd	20,000
Arsenic	1	nd	1,900
Barium	1	75	29,000
Beryllium	0.5	nd	67
Boron	10	26	45,000
Cadmium	0.1	nd	2.7
Chromium	1	nd	810
Cobalt	0.5	nd	87
Copper	0.5	4.9	66
Lead	0.1	nd	25
Molybdenum	0.5	1.8	9,200
Nickel	1	nd	490
Selenium	1	nd	63
Silver	0.1	nd	1.5
Sodium	200	25,100	2,300,300
Thallium	0.1	nd	510
Uranium	0.1	0.7	420
Vanadium	0.5	1.2	250
Zinc	5	nd	1,100

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 20: Parcel 1 - Analytical Test Results
Groundwater - Organochlorine Pesticides (OCP)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L)			MECP Table 3 Residential Standards (µg/L)
		Mar.22, 2019		Apr.29, 2019	
		BH3-GW1 (3.83-6.83m)	BH8-GW1 (3.91-6.91m)	BH13-GW1 (4.72-7.72m)	
Aldrin	0.01	nd	nd	nd	8.5
Alpha-Chlordane	0.01	nd	nd	nd	nv
Gamma-Chlordane	0.01	nd	nd	nd	nv
Chlordane	0.01	nd	nd	nd	28
o,p'-DDD	0.01	nd	nd	nd	nv
p,p'-DDD	0.01	nd	nd	nd	nv
DDD	0.01	nd	nd	nd	45
o,p'-DDE	0.01	nd	nd	nd	nv
p,p'-DDE	0.01	nd	nd	nd	nv
DDE	0.01	nd	nd	nd	20
o,p'-DDT	0.01	nd	nd	nd	nv
p,p'-DDT	0.01	nd	nd	nd	nv
DDT	0.01	nd	nd	nd	2.8
Dieldrin	0.01	nd	nd	nd	0.75
Endosulfan I	0.01	nd	nd	nd	nv
Endosulfan II	0.01	nd	nd	nd	nv
Endosulfan I/II	0.01	nd	nd	nd	1.5
Endrin	0.01	nd	nd	nd	0.48
Heptachlor	0.01	nd	nd	nd	2.5
Heptachlor Epoxide	0.01	nd	nd	nd	0.048
Hexachlorobenzene	0.01	nd	nd	nd	3.1
Hexachlorobutadiene	0.01	nd	0.20	nd	0.44
Hexachlorocyclohexane, gamma	0.01	nd	nd	nd	1.2
Hexachloroethane	0.01	nd	nd	nd	94
Methoxychlor	0.01	nd	nd	nd	6.5
Decachlorobiphenyl	0.01	nd	nd	nd	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 21: Parcel 2 - Analytical Test Results
Groundwater - Organochlorine Pesticides (OCP)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) – April 30, 2019	MECP Table 3 Residential Standards (µg/L)
		BH11-GW1 (4.57-7.57m)	
Aldrin	0.01	nd	8.5
Alpha-Chlordane	0.01	nd	nv
Gamma-Chlordane	0.01	nd	nv
Chlordane	0.01	nd	28
o,p'-DDD	0.01	nd	nv
p,p'-DDD	0.01	nd	nv
DDD	0.01	nd	45
o,p'-DDE	0.01	nd	nv
p,p'-DDE	0.01	nd	nv
DDE	0.01	nd	20
o,p'-DDT	0.01	nd	nv
p,p'-DDT	0.01	nd	nv
DDT	0.01	nd	2.8
Dieldrin	0.01	nd	0.75
Endosulfan I	0.01	nd	nv
Endosulfan II	0.01	nd	nv
Endosulfan I/II	0.01	nd	1.5
Endrin	0.01	nd	0.48
Heptachlor	0.01	nd	2.5
Heptachlor Epoxide	0.01	nd	0.048
Hexachlorobenzene	0.01	nd	3.1
Hexachlorobutadiene	0.01	0.08	0.44
Hexachlorocyclohexane, gamma	0.01	nd	1.2
Hexachloroethane	0.01	nd	94
Methoxychlor	0.01	nd	6.5
Decachlorobiphenyl	0.01	nd	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 22: Parcel 3 - Analytical Test Results
Groundwater - Metals (including As, Sb, Se) and Hg

Parameter	MDL (µg/L)	Groundwater Sample (µg/L)				MECP Table 7 Residential Standards (µg/L)
		May 5, 2020		April 29, 2019	May 5, 2020	
		BH18-GW1 (2.51-5.51m)	BH19-GW1 (3.83-6.83m)	BH20-GW1 (2.82-5.82m)	BH20-GW2 (2.82-5.82m)	
Mercury	0.1	nd	nd	nd	nd	0.1
Antimony	0.5	nd	nd	nt	nd	16,000
Arsenic	1	nd	nd	nt	nd	1,500
Barium	1	50	131	nt	141	23,000
Beryllium	0.5	nd	nd	nt	nd	53
Boron	10	17	nd	nt	79	36,000
Cadmium	0.1	nd	nd	nt	nd	2.1
Chromium	1	nd	nd	nt	nd	640
Cobalt	0.5	1.0	nd	nt	nd	52
Copper	0.5	13.7	nd	nt	4.0	69
Lead	0.1	nd	nd	nt	nd	20
Molybdenum	0.5	10.8	nd	nt	2.6	7,300
Nickel	1	4	nd	nt	nd	390
Selenium	1	nd	nd	nt	nd	50
Silver	0.1	nd	nd	nt	nd	1.2
Sodium	200	54,500	25,600	nt	80,000	1,800,000
Thallium	0.1	nd	nd	nt	nd	400
Uranium	0.1	0.9	nd	nt	0.6	330
Vanadium	0.5	0.5	0.9	nt	nd	200
Zinc	5	13	nd	nt	6	890

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nt – not tested for this parameter

Table 23: Parcel 3 - Analytical Test Results
Groundwater - Organochlorine Pesticides (OCPs)

Parameter	MDL (µg/L)	Groundwater Samples (µg/L) – April 30, 2019	MECP Table 7 Residential Standards (µg/L)
		BH20-GW1 (2.82-5.82m)	
Aldrin	0.01	nd	8.5
Alpha-Chlordane	0.01	nd	nv
Gamma-Chlordane	0.01	nd	nv
Chlordane	0.01	nd	28
o,p'-DDD	0.01	nd	nv
p,p'-DDD	0.01	nd	nv
DDD	0.01	nd	45
o,p'-DDE	0.01	nd	nv
p,p'-DDE	0.01	nd	nv
DDE	0.01	nd	20
o,p'-DDT	0.01	nd	nv
p,p'-DDT	0.01	nd	nv
DDT	0.01	nd	2.8
Dieldrin	0.01	nd	0.75
Endosulfan I	0.01	nd	nv
Endosulfan II	0.01	nd	nv
Endosulfan I/II	0.01	nd	1.5
Endrin	0.01	nd	0.48
Heptachlor	0.01	nd	2.5
Heptachlor Epoxide	0.01	nd	0.048
Hexachlorobenzene	0.01	nd	3.1
Hexachlorobutadiene	0.01	nd	0.44
Hexachlorocyclohexane, gamma	0.01	nd	1.2
Hexachloroethane	0.01	nd	94
Methoxychlor	0.01	nd	6.5
Decachlorobiphenyl	0.01	nd	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter

Table 24: Parcel 4 - Analytical Test Results
Groundwater - Metals (including As, Sb, Se) and Hg

Parameter	MDL (µg/L)	Groundwater Sample (µg/L) - May 5, 2020	MECP Table 7 Residential Standards (µg/L)
		BH16-GW1 (2.84-5.82m)	
Mercury	0.1	nd	0.1
Antimony	0.5	nd	16,000
Arsenic	1	nd	1,500
Barium	1	47	23,000
Beryllium	0.5	nd	53
Boron	10	nd	36,000
Cadmium	0.1	nd	2.1
Chromium	1	nd	640
Cobalt	0.5	0.6	52
Copper	0.5	0.8	69
Lead	0.1	nd	20
Molybdenum	0.5	0.6	7,300
Nickel	1	nd	390
Selenium	1	nd	50
Silver	0.1	nd	1.2
Sodium	200	6,920	1,800,000
Thallium	0.1	nd	400
Uranium	0.1	0.4	330
Vanadium	0.5	0.6	200
Zinc	5	7	890

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL

Table 25: Parcel 4 - Analytical Test Results
Groundwater - Organochlorine Pesticides (OCP)

Parameter	Groundwater Samples (µg/L)				MECP Table 7 Residential Standards (µg/L)
	April 29, 2019		May 5, 2020		
	MDL (µg/L)	BH17-GW1 (2.51-5.51m)	MDL (µg/L)	BH15-GW1 (5.18-8.15m)	
Aldrin	0.01	nd	0.006	nd	8.5
Alpha-Chlordane	0.01	nd	0.006	nd	nv
Gamma-Chlordane	0.01	nd	0.004	nd	nv
Chlordane	0.01	nd	0.007	nd	28
o,p'-DDD	0.01	nd	0.002	nd	nv
p,p'-DDD	0.01	nd	0.005	nd	nv
DDD	0.01	nd	0.006	nd	45
o,p'-DDE	0.01	nd	0.01	nd	nv
p,p'-DDE	0.01	nd	0.005	nd	nv
DDE	0.01	nd	0.008	nd	20
o,p'-DDT	0.01	nd	0.008	nd	nv
p,p'-DDT	0.01	nd	0.008	nd	nv
DDT	0.01	nd	0.01	nd	2.8
Dieldrin	0.01	nd	0.004	nd	0.75
Endosulfan I	0.01	nd	0.005	nd	nv
Endosulfan II	0.01	nd	0.004	nd	nv
Endosulfan I/II	0.01	nd	0.009	nd	1.5
Endrin	0.01	nd	0.006	nd	0.48
Heptachlor	0.01	nd	0.006	nd	2.5
Heptachlor Epoxide	0.01	nd	0.007	nd	0.048
Hexachlorobenzene	0.01	nd	0.005	nd	3.1
Hexachlorobutadiene	0.01	nd	0.01	nd	0.44
Hexachlorocyclohexane, gamma	0.01	nd	nt	nt	1.2
Hexachloroethane	0.01	nd	0.009	nd	94
Methoxychlor	0.01	nd	0.02	nd	6.5
Decachlorobiphenyl	0.01	nd	nt	nt	nv

Notes:
- MDL – Method Detection Limit
- nd – not detected above the MDL
- nv– no MECP standard value for this parameter
- nt – not tested for this parameter

Table 26: Maximum Groundwater Concentrations			
Parameter	**Maximum Concentration (µg/L)**	**Borehole**	**Depth Interval (m BGS)**
Metals			
Barium	141	BH20-GW2	2.82-5.82
Boron	79	BH20-GW2	2.82-5.82
Cobalt	1.0	BH18-GW1	2.51-5.51
Copper	13.7	BH18-GW1	2.51-5.51
Molybdenum	10.8	BH18-GW1	2.51-5.51
Nickel	4	BH18-GW1	2.51-5.51
Sodium	80,000	BH20-GW2	2.82-5.82
Uranium	0.9	BH18-GW1	2.51-5.51
Vanadium	1.2	BH8-GW2	3.91-6.91
Zinc	13	BH18-GW1	2.51-5.51
Organochlorine Pesticides			
Hexachlorobutadiene	0.20	BH8-GW1	3.91-6.91

Table 27 QA/QC Calculations – Soil					
Parameter	**MDL (µg/g)**	**HA7-G1**	**DUP**	**RPD (%)**	**QA/QC Result**
Arsenic	1.0	1.9	1.4	30	Outside the acceptable range
Barium	1.0	85.7	92.7	7.8	Acceptable
Chromium	5.0	22.3	23.8	2.1	Acceptable
Cobalt	1.0	5.9	5.8	1.7	Acceptable
Copper	5.0	13.6	12.7	6.8	Acceptable
Lead	1.0	5.1	3.5	37	Outside the acceptable range
Nickel	5.0	13.0	12.3	10.3	Acceptable
Vanadium	10.0	30.5	34.5	12.3	Acceptable
Zinc	20.0	39.4	37.4	5.2	Acceptable

Notes:
❒ All other parameter concentrations were below laboratory detection limits for both BH8-SS5 and DUP1, and as such, are within acceptable QA/QC parameters.

APPENDIX 1

SAMPLING AND ANALYSIS PLAN

GRAIN SIZE ANALYSES

SOIL PROFILE AND TEST DATA SHEETS

SYMBOLS AND TERMS

LABORATORY CERTIFICATES OF ANALYSIS

Geotechnical Engineering

Environmental Engineering

Hydrogeology

Geological Engineering

Materials Testing

Building Science

Archaeological Services

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Sampling & Analysis Plan

Phase II ESA
7000 Campeau Drive
Ottawa, Ontario

Prepared For

ClubLink Corporation ULC

December 2020

Report: PE4321-SAP_Rev 2

TABLE OF CONTENTS

1.0 SAMPLING PROGRAM

At the request of ClubLink Corporation ULC (ClubLink), Paterson Group conducted a Phase II Environmental Site Assessment of the property at 7000 Campeau Drive in the City of Ottawa, Ontario. The following table summarizes borehole location selection for all subsurface investigations at the subject site.

Borehole	Location & Rationale	Proposed Depth & Rationale
BH1-19	Place borehole within storage area for landscaping materials, to the southwest of the ASTs.	Drill to at least 1.5m below the water table or refusal.
BH2-19	Place borehole as close as possible to location of ASTs to assess potential for petroleum hydrocarbon impacts in the soil and groundwater.	Drill to at least 1.5m below the water table. If refusal encountered, core bedrock to intercept the groundwater table for monitoring well installation.
BH3-19	Place borehole as close as possible to the pesticide storage container adjacent the Turf Building, to assess potential for soil and groundwater impacts.	Drill to at least 1.5m below the water table. If refusal is encountered, core bedrock to intercept the groundwater table for monitoring well installation.
BH4-19	Place borehole on exterior of Turf Building to assess potential for impacted fill in the vicinity of the exterior storage area.	Drill to at least 1.5m below the water table or refusal.
BH5-19		
BH6-19	General coverage of the golf course for geotechnical purposes and to assess for pesticides and/or metal impacts. Boreholes to be placed in roughs or edge of fairways to avoid damage to golf course, as requested by Clublink. Soil to be sampled via split spoon every 0.76m until practical refusal on bedrock. Recover shallow from just below root zone to assess potential for impact related to surficial application of pesticides/herbicides.	Drill to maximum depth of 20m or refusal.
BH7-19		
BH8-19		Drill to maximum depth of 20m. Install monitoring well to obtain water level and to assess potential groundwater impacts resulting from pesticide use.
BH9-19		Drill to maximum depth of 20m or refusal.
BH10-19		Drill to maximum depth of 20m. Install monitoring well to obtain water level and to assess potential groundwater impacts resulting from pesticide use.
BH11-19		
BH12-19		
BH13-19		
BH14-19		Drill to maximum depth of 20m or refusal.
BH15-19		Drill to maximum depth of 20m. If refusal encountered, core bedrock to intercept groundwater table for monitoring well installation.

Borehole	Location & Rationale	Proposed Depth & Rationale
2019 Field Program		
BH16-19 BH17-19 BH18-19 BH19-19 BH20-19	General coverage of the golf course for geotechnical purposes and to assess for pesticides and/or metal impacts. Boreholes to be placed in roughs or edge of fairways to avoid damage to golf course, as requested by Clublink. Soil to be sampled via split spoon every 0.76m until practical refusal on bedrock. Recover shallow from just below root zone to assess potential for impact related to surficial application of pesticides/herbicides.	Drill to maximum depth of 20m. If refusal encountered, core bedrock to intercept groundwater table for monitoring well installation.
HA1 to HA20	General coverage of the fairways and roughs to assess for potential shallow soil impacts resulting from the application of pesticides/herbicides.	Collect sample from just beneath the topsoil, to a depth of approximately 0.25m below grade.
May 2020 Sampling Program		
HA1-20 to HA21-20 and HA32-20 to HA34-20	Additional coverage of the greens, tees and/or fairways to assess for potential shallow soil impacts resulting from the surficial application of pesticides/herbicides. Collect samples along fringe of greens as requested by ClubLink, to prevent significant damage to playing surface.	Collect samples from just below root mass to depths up to 0.30m below grade using sampling tool provided by ClubLink, to target areas where most significant contaminant concentrations resulting from the surficial application of pesticides would be expected.
HA22-20 to HA31-20	Place 10 to 15m from HA14 and HA15 (2019) in each direction to horizontally delineate previously identified mercury impacts. Place HA22-20 and HA27-20 at the location of the previous impacts for the purposes of vertical delineation.	Samples collected for horizontal delineation purposes should be collected from approximately 0.05 to 0.30m below grade. Vertical delineation samples should be collected from depths beneath the original exceedances (ie. deeper than 0.30m below grade). Ensure minimal damage to ground surface, as requested by ClubLink.
December 2020 Sampling Program **Parcel 1**		
HA35-20 HA36-20	Place within rough east and northwest of HA3-20 for lateral delineation purposes; to confirm lateral extents of shallow soil mercury impacts are contained within the limits of golf course.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade. Shallow samples to be analysed to confirm lateral delineation; deeper samples to be analysed if required.
HA37-20	Place within rough between 9th and 18th hole, south of property boundary; for lateral delineation and to confirm lateral extent of shallow soil mercury impacts contained within limits of golf course.	

Borehole	Location & Rationale	Proposed Depth & Rationale
HA38-20	Place at location of HA13-20.	Collect sample from 0.30 to 0.60m for vertical delineation of impacts at HA13-20. Collect duplicate sample for QA/QC.
HA39-20	Place within rough south of 18th hole for lateral delineation.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade. Shallow samples to be analysed to confirm lateral delineation; deeper samples to be analysed if required.
HA40-20 HA41-20	Place within rough west of 11th hole for lateral and vertical delineation of impacts at HA17-20.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations. Deep sample at HA40 to be analysed with shallow sample at HA41 to be analysed. Additional samples to be analysed if required. Collect duplicate sample of BH40B for QA/QC.
HA51-20 HA52-20 HA58-20	Place within roughs north and south of 6th hole to laterally delineation impacts at HA7-20 and HA9-20.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation; deeper samples to be analysed if required.
December 2020 Sampling Program Parcel 2		
HA48-20 HA49-20 HA50-20	Place north, east and west of HA6-20 for lateral delineation purposes.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation; deeper samples to be analysed if required.
HA53-20 to HA56-20	Place north, east, west of HA5-20 as well as in the immediate vicinity of HA5-20.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation at HA53-20, HA54-20 and HA56-20; deeper sample to be analysed at HA56-20 and from additional locations if required. Collect duplicate of sample HA55B-20 for QA/QC.

Borehole	Location & Rationale	Proposed Depth & Rationale
December 2020 Sampling Program Parcel 3		
HA44-20 HA45-20 HA46-20	Place for lateral delineation and/or vertical delineation of impacts identified on Parcel 3.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation at HA44-20, HA45-20 and HA46-20; deeper sample to be analysed at HA46-20 and from additional locations if required. Collect duplicates of samples HA44A-20 and HA46B-20 for QA/QC.
December 2020 Sampling Program Parcel 4		
HA42-20 HA43-20	Place west of HA18-20 and HA19-20 in rough near property boundary for lateral delineation purposes and to confirm extent of metal impacted soil within property limit.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation; deeper sample to be analysed if required. Collect a duplicate of Sample HA43A for QA/QC.
HA47-20	Place east of HA32-20 in rough near property boundary for lateral delineation purposes and to confirm extent of metal impacted soil within property limit.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; shallow samples to be analysed for lateral delineation; deeper sample to be analysed if required.
HA57-20	Please near BH15-10 in rough for additional coverage/delineation on south side of Parcel 4.	Collect samples from 0.05 to 0.30m below grade and 0.30 to 0.60m below grade at both locations; both samples to be analysed.

Borehole locations are shown on the Test Hole Location Plan appended to the main report.

At each borehole, initial auger samples will be followed by split-spoon samples of overburden soils will be obtained at 0.76 m (2'6") intervals. All soil samples will be retained, and samples will be selected for submission following a preliminary screening analysis.

Following borehole drilling, monitoring wells will be installed in 13 boreholes for the collection of groundwater samples and for the measurement of water levels across the site. Where coring is required, core samples will be retained for laboratory review.

Hand auger samples will be collected once weather conditions are suitable, for the purpose of collecting shallow soil samples. A composite sample of soil from just below the topsoil layer to approximately 0.25m below grade, was collected at each of the 2019 sample locations.

Composite hand auger samples will be split into two, over the recoverable length, during the 2020 sampling event. It is important note that samples will be collected using sampling tools provided by ClubLink to minimize disturbance to the playable areas of the golf course with the exception of a 1-inch auger provided by Paterson and used to obtain vertical delineation samples. As noted above, potential contaminants related to the surficial application of pesticides are expected to be present in near surface soils.

Soil quality at all boreholes will be screened using visual and olfactory screening methods. If contamination is suspected, soil samples will be submitted to vapour screening and soil samples may be analyzed.

2.0 ANALYTICAL TESTING PROGRAM

The analytical testing program for soil at the subject site is based on the following general considerations:

- ❒ At least one sample from boreholes across the site should be submitted, in order to determine the extent of possible contamination resulting from the APECs identified in the Phase I ESA.

- ❒ In boreholes where there is visual or olfactory evidence of contamination, or where organic vapour meter or photoionization detector readings indicate the presence of contamination, the 'worst-case' sample from each borehole should be submitted for comparison with MECP site condition standards.

- ❒ In boreholes with evidence of contamination as described above, a sample should be submitted from the stratigraphic unit below the 'worst-case' sample to determine whether the contaminant(s) have migrated downward.

- ❒ Parameters analyzed should be consistent with the Contaminants of Potential Concern identified in the Phase I-ESA.

- ❒ During the 2020 field program, all composite hand auger samples collected will be submitted for analytical testing, to supplement the testing conducted during the 2019 field program.

The analytical testing program for groundwater at the subject site is based on the following general considerations:

- ❒ Groundwater monitoring wells should be installed in boreholes located on the southern and northern portion of the property, with visual or olfactory evidence of soil contamination, within bedrock, at or below the water table (i.e. a water sample can be obtained).

- ❒ Groundwater monitoring well screens should straddle the water table at sites where the contaminants of concern are suspected to be LNAPLs.

- ❒ Parameters analyzed should be consistent with the Contaminants of Concern identified in the Phase I-ESA and with the contaminants identified in the soil samples.

3.0 STANDARD OPERATING PROCEDURES

3.1 Environmental Drilling Procedure

Purpose

The purpose of environmental boreholes is to identify and/or delineate contamination within the soil and/or to install groundwater monitoring wells in order to identify contamination within the groundwater.

Equipment

The following is a list of equipment that is in addition to regular drilling equipment stated in the geotechnical drilling SOP:

- ❒ glass soil sample jars
- ❒ two buckets
- ❒ cleaning brush (toilet brush works well)
- ❒ dish detergent
- ❒ methyl hydrate
- ❒ water (if not available on site - water jugs available in trailer)
- ❒ latex or nitrile gloves (depending on suspected contaminant)
- ❒ RKI Eagle organic vapour meter or MiniRae photoionization detector (depending on contamination suspected)

Determining Borehole Locations

If conditions on site are not as suspected, and planned borehole locations cannot be drilled, call the office to discuss. Alternative borehole locations will be determined in conversation with the field technician and supervising engineer.

After drilling is completed a plan with the borehole locations must be provided. Distances and orientations of boreholes with respect to site features (buildings, roadways, etc.) must be provided. Distances should be measured using a measuring tape or wheel rather than paced off. Ground surface elevations at each borehole should be surveyed relative to a geodetic benchmark, if one is available, or a temporary site benchmark which can be tied in at a later date if necessary.

Drilling Procedure

The actual drilling procedure for environmental boreholes is the same as geotechnical boreholes (see SOP for drilling and sampling) with a few exceptions as follows:

- ❒ Continuous split spoon samples (every 0.6 m or 2') or semi-continuous (every 0.76 m or 2'6") are required.
- ❒ Make sure samples are well sealed in plastic bags with no holes prior to screening and are kept cool but unfrozen.
- ❒ If sampling for VOCs, BTEX, or PHCs F1, a soil core from each soil sample which may be analyzed must be taken and placed in the laboratory-provided methanol vial.
- ❒ Note all and any odours or discolouration of samples.
- ❒ Split spoon samplers must be washed between samples.
- ❒ If obvious contamination is encountered, continue sampling until vertical extent of contamination is delineated.
- ❒ As a general rule, environmental boreholes should be deep enough to intercept the groundwater table (unless this is impossible/impractical - call project manager to discuss).
- ❒ If at all possible, soil samples should be submitted to a preliminary screening procedure on site, either using a RKI Eagle, PID, etc. depending on type of suspected contamination.

Spoon Washing Procedure

All sampling equipment (spilt spoons, etc.) must be washed between samples in order to prevent cross contamination of soil samples.

- ❒ Obtain two buckets of water (preferably hot if available)
- ❒ Add a small amount of dish soap to one bucket
- ❒ Scrub spoons with brush in soapy water, inside and out, including tip
- ❒ Rinse in clean water
- ❒ Apply a small amount of methyl hydrate to the inside of the spoon. (A spray bottle or water bottle with a small hole in the cap works well)
- ❒ Allow to dry (takes seconds)
- ❒ Rinse with distilled water, a spray bottle works well.

The methyl hydrate eliminates any soap residue that may be on the spoon and is especially important when dealing with suspected VOCs.

Screening Procedure

The RKI Eagle is used to screen most soil samples, particularly where petroleum hydrocarbon contamination is suspected. The MiniRae is used when VOCs are suspected, however it also can be useful for detecting petroleum. These tools are for screening purposes only and cannot be used in place of laboratory testing. Vapour results obtained from the RKI Eagle and the PID are relative and must be interpreted.

Screening equipment should be calibrated on an approximately monthly basis, more frequently if heavily used.

- ❒ Samples should be brought to room temperature; this is specifically important in colder weather. Soil must not be frozen.
- ❒ Turn instrument on and allow to come to zero - calibrate if necessary
- ❒ If using RKI Eagle, ensure instrument is in methane elimination mode unless otherwise directed.
- ❒ Ensure measurement units are ppm (parts per million) initially. RKI Eagle will automatically switch to %LEL (lower explosive limit) if higher concentrations are encountered.
- ❒ Break up large lumps of soil in the sample bag, taking care not to puncture bag.
- ❒ Insert probe into soil bag, creating a seal with your hand around the opening.
- ❒ Gently manipulate soil in bag while observing instrument readings.
- ❒ Record the highest value obtained in the first 15 to 25 seconds
- ❒ Make sure to indicate scale (ppm or LEL); also note which instrument was used (RKI Eagle 1 or 2, or MiniRae).
- ❒ Jar samples and refrigerate as per Sampling and Analysis Plan.

3.2 Monitoring Well Installation Procedure

Equipment

- ❒ 5' x 2" threaded sections of Schedule 40 PVC slotted well screen (5' x 1 ¼" if installing in cored hole in bedrock)
- ❒ 5' x 2" threaded sections of Schedule 40 PVC riser pipe (5' x 1 ¼" if installing in cored hole in bedrock)
- ❒ Threaded end-cap
- ❒ Slip-cap or J-plug
- ❒ Asphalt cold patch or concrete
- ❒ Silica Sand
- ❒ Bentonite chips (Holeplug)
- ❒ Steel flushmount casing

Procedure

- ❒ Drill borehole to required depth, using drilling and sampling procedures described above.
- ❒ If borehole is deeper than required monitoring well, backfill with bentonite chips to required depth. This should only be done on wells where contamination is not suspected, in order to prevent downward migration of contamination.
- ❒ Only one monitoring well should be installed per borehole.
- ❒ Monitoring wells should not be screened across more than one stratigraphic unit to prevent potential migration of contaminants between units.
- ❒ Where LNAPLs are the suspected contaminants of concern, monitoring wells should be screened straddling the water table in order to capture any free product floating on top of the water table.
- ❒ Thread the end cap onto a section of screen. Thread second section of screen if required. Thread risers onto screen. Lower into borehole to required depth. Ensure slip-cap or J-plug is inserted to prevent backfill materials entering well.
- ❒ As drillers remove augers, backfill borehole annulus with silica sand until the level of sand is approximately 0.3 m above the top of the screen.
- ❒ Backfill with holeplug until at least 0.3 m of holeplug is present above the top of the silica sand.
- ❒ Backfill remainder of borehole with holeplug or with auger cuttings (if contamination is not suspected).
- ❒ Install flushmount casing. Seal space between flushmount and borehole annulus with concrete, cold patch, or holeplug to match surrounding ground surface.

3.3 Monitoring Well Sampling Procedure

Equipment

- ❒ Water level metre or interface probe on hydrocarbon/LNAPL sites
- ❒ Spray bottles containing water and methanol to clean water level tape or interface probe
- ❒ Peristaltic pump
- ❒ Polyethylene tubing for peristaltic pump
- ❒ Flexible tubing for peristaltic pump
- ❒ Latex or nitrile gloves (depending on suspected contaminant)
- ❒ Allen keys and/or 9/16" socket wrench to remove well caps
- ❒ Graduated bucket with volume measurements
- ❒ pH/Temperature/Conductivity combo pen
- ❒ Laboratory-supplied sample bottles

Sampling Procedure

- ❒ Locate well and use socket wrench or Allan key to open metal flush mount protector cap. Remove plastic well cap.
- ❒ Measure water level, with respect to existing ground surface, using water level meter or interface probe. If using interface probe on suspected NAPL site, measure the thickness of free product.
- ❒ Measure total depth of well.
- ❒ Clean water level tape or interface probe using methanol and water. Change gloves between wells.
- ❒ Calculate volume of standing water within well and record.
- ❒ Insert polyethylene tubing into well and attach to peristaltic pump. Turn on peristaltic pump and purge into graduated bucket. Purge at least three well volumes of water from the well. Measure and record field chemistry. Continue to purge, measuring field chemistry after every well volume purged, until appearance or field chemistry stabilizes.
- ❒ Note appearance of purge water, including colour, opacity (clear, cloudy, silty), sheen, presence of LNAPL, and odour. Note any other unusual features (particulate matter, effervescence (bubbling) of dissolved gas, etc.).
- ❒ Fill required sample bottles. If sampling for metals, attach 75-micron filter to discharge tube and filter metals sample. If sampling for VOCs, use low flow rate to ensure continuous stream of non-turbulent flow into sample bottles. Ensure no headspace is present in VOC vials.
- ❒ Replace well cap and flushmount casing cap.

4.0 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

The QA/QC program for this Phase II ESA is as follows:

- ❒ All non-dedicated sampling equipment (split spoons) will be decontaminated according to the SOPs listed above.
- ❒ All groundwater sampling equipment is dedicated (polyethylene and flexible peristaltic tubing is replaced for each well).
- ❒ Where combo pens are used to measure field chemistry, they will be calibrated on an approximately monthly basis, according to frequency of use.

5.0 DATA QUALITY OBJECTIVES

The purpose of setting data quality objectives (DQOs) is to ensure that the level of uncertainty in data collected during the Phase II-ESA is low enough that decision-making is not affected, and that the overall objectives of the investigation are met.

The quality of data is assessed by comparing field duplicates with original samples. If the relative percent difference (RPD) between the duplicate and the sample is within 20%, the data are considered to be of sufficient quality so as not to affect decision-making. The RPD is calculated as follows:

$$RPD = \left| \frac{x_1 - x_2}{(x_1 + x_2)/2} \right| \times 100\%$$

Where x_1 is the concentration of a given parameter in an original sample and x_2 is the concentration of that same parameter in the field duplicate sample.

For the purpose of calculating the RPD, it is desirable to select field duplicates from samples for which parameters are present in concentrations above laboratory detection limits, i.e. samples which are expected to be contaminated. If parameters are below laboratory detection limits for selected samples or duplicates, the RPD may be calculated using a concentration equal to one half (0.5 x) the laboratory detection limit.

It is also important to consider data quality in the overall context of the project. For example, if the DQOs are not met for a given sample, yet the concentrations of contaminants in both the sample and the duplicate exceed the MECP site remediation standards by a large margin, the decision-making usefulness of the sample may not be considered to be impaired.

The proximity of other samples which meet the DQOs must also be considered in developing the Phase II Conceptual Site Model; often there are enough data available to produce a reliable Phase II Conceptual Site Model even if DQOs are not met for certain individual samples. These considerations are discussed in the body of the report.

6.0 PHYSICAL IMPEDIMENTS TO SAMPLING & ANALYSIS PLAN

Physical impediments to the Sampling and Analysis plan may include:

- ❒ The location of underground utilities
- ❒ Poor recovery of split-spoon soil samples
- ❒ Insufficient groundwater volume for groundwater samples
- ❒ Breakage of sampling containers following sampling or while in transit to the laboratory
- ❒ Elevated detection limits due to matrix interference (generally related to soil colour or presence of organic material)
- ❒ Elevated detection limits due to high concentrations of certain parameters, necessitating dilution of samples in laboratory
- ❒ Drill rig breakdowns
- ❒ Winter conditions
- ❒ Other site-specific impediments

Site-specific impediments to the Sampling and Analysis plan are discussed in the body of the Phase II-ESA report.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

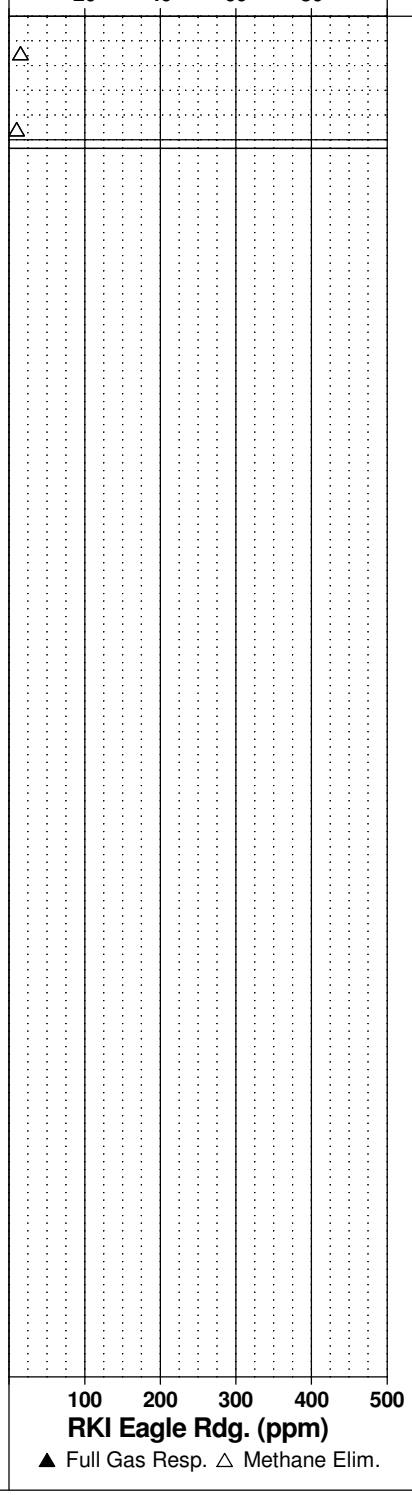
FILE NO. PE4321

REMARKS

HOLE NO. BH 1-19

BORINGS BY CME 55 Power Auger **DATE** February 27, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
FILL: Brown silty sand with topsoil, some gravel, trace clay		AU	1			0	105.47		
1.07		SS	2	33	50+	1	104.47		
End of Borehole Practical refusal to augering at 1.07m depth									



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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 2-19

BORINGS BY CME 55 Power Auger **DATE** February 27, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	105.20
Asphaltic concrete 0.08		AU	1				
FILL: Brown silty sand with gravel and crushed stone 0.91						1	104.20
		RC	1	95	57	2	103.20
BEDROCK: Sound to very sound grey to red metamorphic gneiss		RC	2	98	90	3	102.20
						4	101.20
		RC	3	100	97	5	100.20
		RC	4	94	88	6	99.20
6.40 End of Borehole							
(GWL @ 2.83m - May 5, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 3-19

BORINGS BY CME 55 Power Auger **DATE** February 26, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	105.72
Asphaltic concrete 0.08		AU	1				
FILL: Brown silty sand with gravel and crushed stone		SS	2	79	42	1	104.72
1.42		RC	1	95	70	2	103.72
BEDROCK: Fractured to very sound, grey to red metamorphic gneiss		RC	2	100	65	3	102.72
		RC	3	100	100	4	101.72
		RC	4	100	84	5	100.72
6.83						6	99.72
End of Borehole							
(GWL @ 3.35m - April 29, 2019)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

patersongroup Consulting Engineers

154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 4-19

BORINGS BY CME 55 Power Auger **DATE** February 27, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
Asphaltic concrete 0.08									
FILL: Brown silty sand, some crushed stone 0.20		AU	1						
0.60		SS	2	50	50+				
FILL: Brown silty clay, trace topsoil						0	105.38		
GLACIAL TILL: Dense, brown silty sand with gravel 1.22						1	104.38		
End of Borehole									
Practical refusal to augering at 1.22m depth									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

RKI Eagle Rdg. (ppm): 100 200 300 400 500

▲ Full Gas Resp. △ Methane Elim.

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 5-19

BORINGS BY CME 55 Power Auger **DATE** February 27, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: ● Volatile Organic Rdg. (ppm) / ○ Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE						0	105.40		
Asphaltic concrete 0.10		AU	1						
FILL: Brown silty sand with crushed stone and gravel		SS	2	50	50+				
0.99									
End of Borehole									
Practical refusal to augering at 0.99m depth									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 6-19

BORINGS BY CME 55 Power Auger **DATE** February 26, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
Brown **SILTY CLAY** with topsoil		AU	1			0	100.38		
0.15		AU	2						
		SS	3	0	10	1	99.38		
		SS	4	67	9	2	98.38		
		SS	5	100	7	3	97.38		
Very stiff to stiff, brown **SILTY CLAY**									
		SS	6	100	6	4	96.38		
- grey by 4.6m depth		SS	7	100	1	5	95.38		
						6	94.38		
		SS	8	100	1	7	93.38		
8.38						8	92.38		
GLACIAL TILL: Stiff, grey silty clay with sand, gravel and cobbles, occasional boulders - dense by 9.0m depth - clay content decreasing with depth		SS	9	29	18	9	91.38		
		SS	10	46	62				
9.78									
End of Borehole									

Photo Ionization Detector: ○ Lower Explosive Limit % — 20 40 60 80

100 200 300 400 500
RKI Eagle Rdg. (ppm)
▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 7-19

BORINGS BY CME 55 Power Auger **DATE** February 25, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)	Photo Ionization Detector: Volatile Organic Rdg. (ppm) / Lower Explosive Limit %	Monitoring Well Construction
GROUND SURFACE									
TOPSOIL and ORGANICS 0.08		AU	1			0	98.48		
FILL: Brown silty clay with topsoil, organics, some sand and gravel 1.22		SS	2	58	6	1	97.48		
		SS	3	75	6	2	96.48		
		SS	4	96	4	3	95.48		
Very stiff to stiff, brown **SILTY CLAY**									
- grey by 3.5m depth		SS	5	100	2	4	94.48		
						5	93.48		
						6	92.48		
		SS	6	100	2				
		SS	7	100	1	7	91.48		
		SS	8	100	2	8	90.48		
- trace sand and gravel by 8.5m depth		SS	9	100	5				
9.20						9	89.48		
End of Borehole									
Practical refusal to augering at 9.20m depth									

Photo Ionization Detector: ● Volatile Organic Rdg. (ppm); ○ Lower Explosive Limit %

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 8-19

BORINGS BY CME 55 Power Auger **DATE** February 25, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	98.21
TOPSOIL 0.13		AU	1				
FILL: Brown silty clay with sand, some gravel						1	97.21
1.22		SS	2	54	11		
		SS	3	79	8	2	96.21
		SS	4	100	4		
Very stiff to stiff, brown **SILTY CLAY**						3	95.21
- grey by 3.7m depth		SS	5	100	11	4	94.21
						5	93.21
						6	92.21
		SS	6	100	W		
6.70							
Grey **CLAYEY SILT,** trace sand and gravel 6.91		SS	7	100	50+		
End of Borehole							
Practical refusal to augering at 6.91m depth							
(GWL @ 1.29m - May 5, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH 9-19

BORINGS BY CME 55 Power Auger **DATE** February 27, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	102.21
Brown **SILTY CLAY** with topsoil & organics		AU	1				
0.10		AU	2				
0.56							
FILL: Brown silty clay, trace topsoil							
FILL: Brown silty sand with clay, gravel and cobbles, occasional boulders		SS	3	71	19	1	101.21
- grey by 1.4m depth		SS	4	58	28	2	100.21
2.21							
		SS	5	42	8	3	99.21
Very stiff, brown **SILTY CLAY**		SS	6	100	5	4	98.21
- grey by 5.2m depth						5	97.21
5.61		SS	7		23		
GLACIAL TILL: Stiff, grey silty clay with sand, trace gravel and cobbles, occasional boulders		SS	8		7	6	96.21
6.65							
End of Borehole							
Practical refusal to augering at 6.65m depth							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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154 Colonnade Road South, Ottawa, Ontario K2E 7J5

SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH10-19

BORINGS BY CME 55 Power Auger **DATE** February 28, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	100.61
TOPSOIL 0.10		AU	1				
FILL: Brown silty clay, trace sand, gravel and topsoil		AU	2				
		SS	3	42	6	1	99.61
1.37							
FILL: Brown silty sand, some gravel, topsoil and organics		SS	4	54	14	2	98.61
1.98							
Very stiff, brown **SILTY CLAY**		SS	5	75	12		
		SS	6	83	10	3	97.61
3.66							
		SS	7	38	20	4	96.61
GLACIAL TILL: Compact to dense, brown silty clay with sand and gravel, occasional cobbles and boulders		SS	8	29	27	5	95.61
		SS	9	56	30		
5.74							
End of Borehole							
Practical refusal to augering at 5.74m depth							
(GWL @ 2.19m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH11-19

BORINGS BY CME 55 Power Auger **DATE** February 28, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	94.64
FILL: Brown silty clay with topsoil, trace sand and organics		AU	1				
0.56		AU	2				
		SS	3	58	8	1	93.64
Very stiff to stiff, brown **SILTY CLAY**		SS	4	83	3	2	92.64
- grey by 3.0m depth		SS	5	100	1	3	91.64
- firm by 4.0m depth						4	90.64
4.42							
GLACIAL TILL: Grey silty clay/clayey silt, some sand, trace gravel, occasional cobbles and boulders		SS	6	46	2	5	89.64
- sand and gravel increasing with depth		SS	7	0	9	6	88.64
		SS	8	38	20	7	87.64
7.57							
End of Borehole							
Practical refusal to augering at 7.57m depth							
(GWL @ 0.28m - May 5, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH12-19

BORINGS BY CME 55 Power Auger **DATE** February 28, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	95.64
		AU	1				
FILL: Brown silty clay with sand, trace gravel and topsoil		AU	2				
1.22		SS	3	33	21	1	94.64
		SS	4	46	7	2	93.64
		SS	5	96	10		
		SS	6	100	7	3	92.64
Very stiff to stiff, brown **SILTY CLAY** with sand						4	91.64
- sand content decreasing with depth		SS	7		2	5	90.64
- grey by 5.3m depth						6	89.64
		SS	8	100	1	7	88.64
8.23						8	87.64
End of Borehole							
(GWL @ 1.46m - April 30, 2019)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

Monitoring Well Construction

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

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SOIL PROFILE AND TEST DATA

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FILE NO. PE4321

REMARKS

HOLE NO. BH13-19

BORINGS BY CME 55 Power Auger **DATE** March 7, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	102.84
FILL: Brown silty sand with topsoil 0.18		AU	1				
FILL: Brown silty clay with sand and topsoil, trace organics 0.60		AU	2				
FILL: Brown silty sand		SS	3	38	34	1	101.84
- trace clay by 1.7m depth							
- some gravel and cobbles by 2.0m depth		SS	4	50	50+	2	100.84
2.29							
		SS	5	79	8	3	99.84
Very stiff to stiff, brown **SILTY CLAY**		SS	6	88	5	4	98.84
						5	97.84
- grey by 6.1m depth		SS	7	100	1	6	96.84
- trace sand and gravel by 7.6m depth						7	95.84
7.72		SS	8	100	50+		
End of Borehole							
Practical refusal to augering at 7.72m depth							
(GWL @ 1.40m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
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DATUM Ground surface elevations provided by Stantec Geomatics Ltd.

FILE NO. PE4321

REMARKS

HOLE NO. BH14-19

BORINGS BY CME 55 Power Auger **DATE** March 7, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	100.90
FILL: Brown silty clay with topsoil & organics (0.20)		AU	1				
(0.59)		AU	2				
FILL: Brown silty clay with sand, some topsoil, trace gravel (0.81)							
TOPSOIL		SS	3	88	11	1	99.90
		SS	4	92	6	2	98.90
Very stiff to stiff, brown **SILTY CLAY**		SS	5	100	4	3	97.90
- firm and grey by 4.6m depth						4	96.90
- some sand, trace gravel by 5.2m depth		SS	6	100	1	5	95.90
(6.10)						6	94.90
GLACIAL TILL: Grey silty clay with sand and gravel, occ cobbles and boulders		SS	7	33	6		
(7.01)		SS	8	100	50+	7	93.90
End of Borehole							
Practical refusal to augering at 7.01m depth							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

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FILE NO. PE4321

REMARKS

HOLE NO. BH15-19

BORINGS BY CME 55 Power Auger **DATE** March 8, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.08
TOPSOIL and brown **SILTY CLAY** some gravel		AU	1				
0.15		AU	2				
		SS	3	54	13	1	98.08
		SS	4	100	9	2	97.08
		SS	5	100	4		
Very stiff, brown **SILTY CLAY**						3	96.08
						4	95.08
- firm to stiff and grey by 4.6m depth						5	94.08
						6	93.08
		SS	6	100	1		
- some sand and gravel by 7.6m depth						7	92.08
		SS	7		16		
8.15						8	91.08
End of Borehole							
Practical refusal to augering at 8.15m depth							
(GWL @ 0.32m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

Phase II Environmental Site Assessment
Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

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FILE NO. PE4321

REMARKS

HOLE NO. BH16-19

BORINGS BY CME 55 Power Auger **DATE** March 8, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	97.31
FILL: Brown silty clay, some topsoil, gravel and organics 0.15		AU	1				
		AU	2				
FILL: Brown silty sand, some gravel 1.22		SS	3	100	13	1	96.31
		SS	4	100	8	2	95.31
Very stiff to stiff, brown **SILTY CLAY** 4.57						3	94.31
						4	93.31
GLACIAL TILL: Grey silty clay with sand and gravel, occasional cobbles and boulders 5.84		SS	5	42	18	5	92.31
End of Borehole							
Practical refusal to augering at 5.84m depth							
(GWL @ 0.08m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

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Kanata Lakes Golf & Country Club
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FILE NO. PE4321

REMARKS

HOLE NO. BH17-19

BORINGS BY CME 55 Power Auger **DATE** March 13, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	97.15
FILL: Brown silty clay with topsoil and organics		AU	1				
		AU	2				
		SS	3	75	9	1	96.15
- some sand by 0.9m depth		SS	4	100	13		
1.75						2	95.15
		RC	1	100	100		
						3	94.15
BEDROCK: Very sound, grey metamorphic gneiss		RC	2	100	100		
						4	93.15
		RC	3	100	100		
						5	92.15
5.51							
End of Borehole							
(GWL @ 0.10m - April 29, 2019)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

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Kanata Lakes Golf & Country Club
Campeau Drive, Ottawa, Ontario

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FILE NO. PE4321

REMARKS

HOLE NO. BH18-19

BORINGS BY CME 55 Power Auger **DATE** March 12, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	99.05
Asphaltic concrete 0.10		AU	1				
FILL: Brown silty sand with gravel and crushed stone 0.59		AU	2				
		RC	1	100	79	1	98.05
		RC	2	100	95	2	97.05
BEDROCK: Fractured to very sound, grey metamorphic gneiss - vertical seam from 2.5 to 3.0m depth		RC	3	100	58	3	96.05
		RC	4	100	100	4	95.05
5.51						5	94.05
End of Borehole (GWL @ 2.94m - May 5, 2020)							

Photo Ionization Detector
● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

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FILE NO. PE4321

REMARKS

HOLE NO. BH19-19

BORINGS BY CME 55 Power Auger **DATE** March 12, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	96.57
TOPSOIL 0.15		AU	1				
		AU	2				
FILL: Brown to grey silty clay, some sand and gravel, trace topsoil and organics		SS	3	62	12	1	95.57
		SS	4	12	20	2	94.57
2.21							
		SS	5	100	50+		
Peat, topsoil and wood							
3.12		SS	6	67	50+	3	93.57
		RC	1	100	88		
						4	92.57
BEDROCK: Sound to very sound, grey to red metamorphic gneiss		RC	2	100	100	5	91.57
		RC	3	100	98	6	90.57
6.83							
End of Borehole							
(GWL @ 0.49m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction

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SOIL PROFILE AND TEST DATA

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Kanata Lakes Golf & Country Club
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FILE NO. PE4321

REMARKS

HOLE NO. BH20-19

BORINGS BY CME 55 Power Auger **DATE** March 13, 2019

SOIL DESCRIPTION	STRATA PLOT	SAMPLE TYPE	SAMPLE NUMBER	SAMPLE % RECOVERY	SAMPLE N VALUE or RQD	DEPTH (m)	ELEV. (m)
GROUND SURFACE						0	97.58
FILL: Brown silty clay, some sand, gravel, topsoil and organics 0.46		AU	1				
		AU	2				
Very stiff, brown **SILTY CLAY**		SS	3	75	16	1	96.58
- some gravel and trace sand by 0.9m depth		SS	4	62	50+		
1.75						2	95.58
		RC	1	100	98		
						3	94.58
BEDROCK: Very sound, grey metamorphic gneiss		RC	2	100	95	4	93.58
		RC	3	100	96	5	92.58
5.82							
End of Borehole							
(GWL @ 1.92m - May 5, 2020)							

Photo Ionization Detector

● Volatile Organic Rdg. (ppm)

○ **Lower Explosive Limit %**

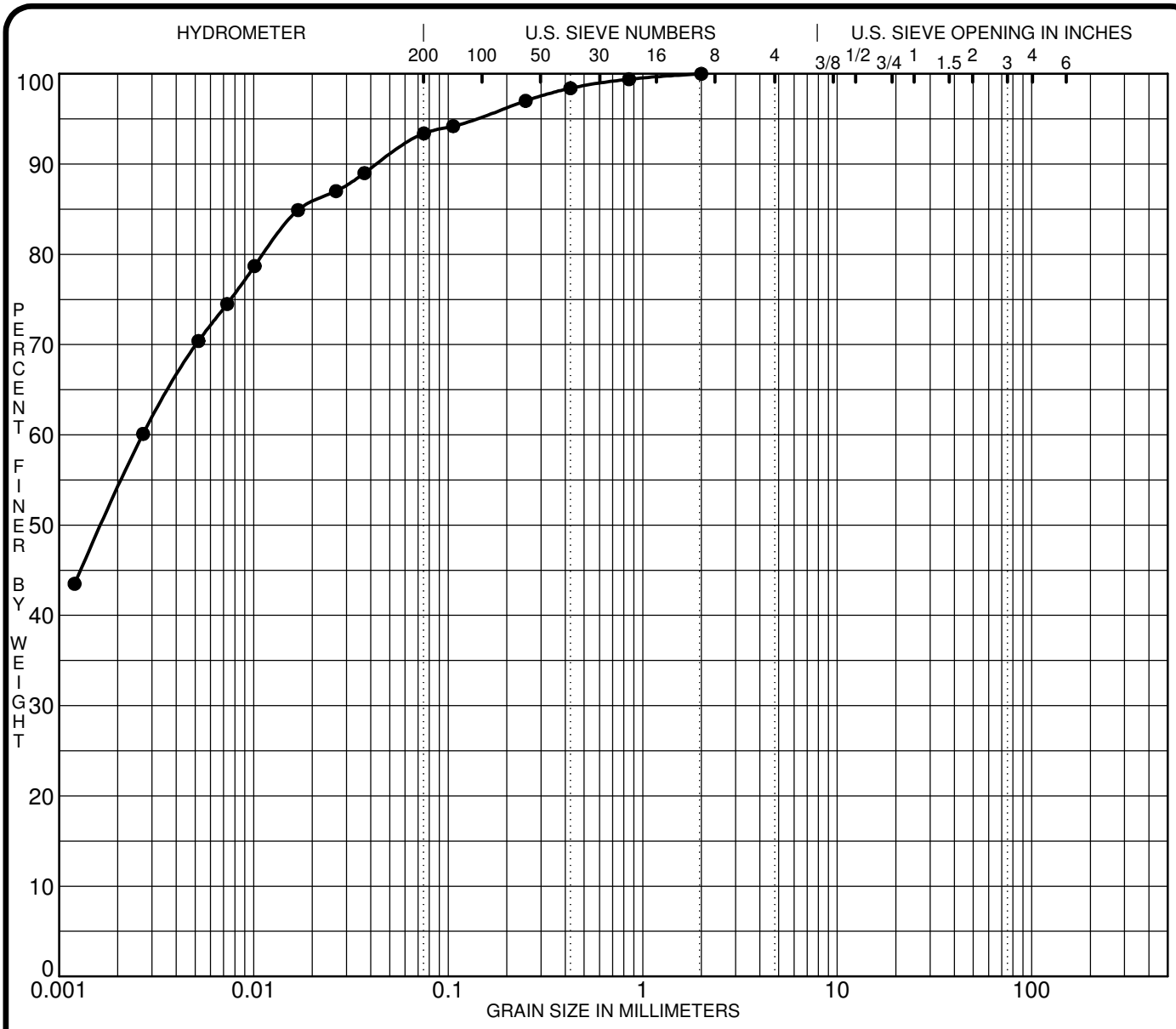
20 40 60 80

100 200 300 400 500

RKI Eagle Rdg. (ppm)

▲ Full Gas Resp. △ Methane Elim.

Monitoring Well Construction



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH 6-19 SS 4**	**CH - Inorganic clays of high plasticity**						

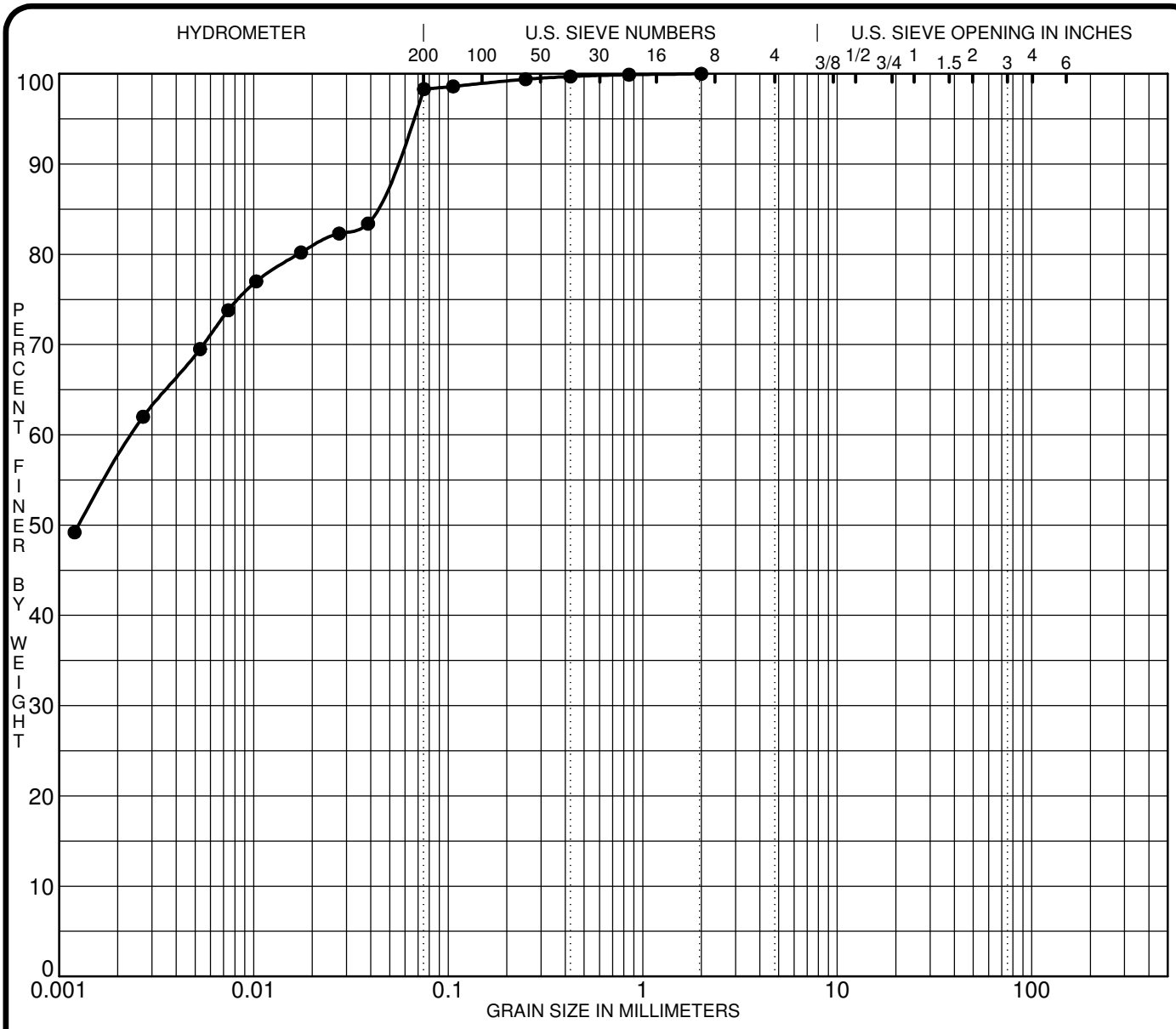
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH 6-19 SS 4**	**2.00**	**0.00**			**0.0**	**6.6**	**93.4**	

CLIENT **Minto Communities Inc.** FILE NO. **PG4135**

PROJECT **Geotechnical Investigation - Kanata Lakes Golf & Country Club** DATE **26 Feb 19**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH11-19 SS 4**	**MH - Inorganic silts of high plasticity**						

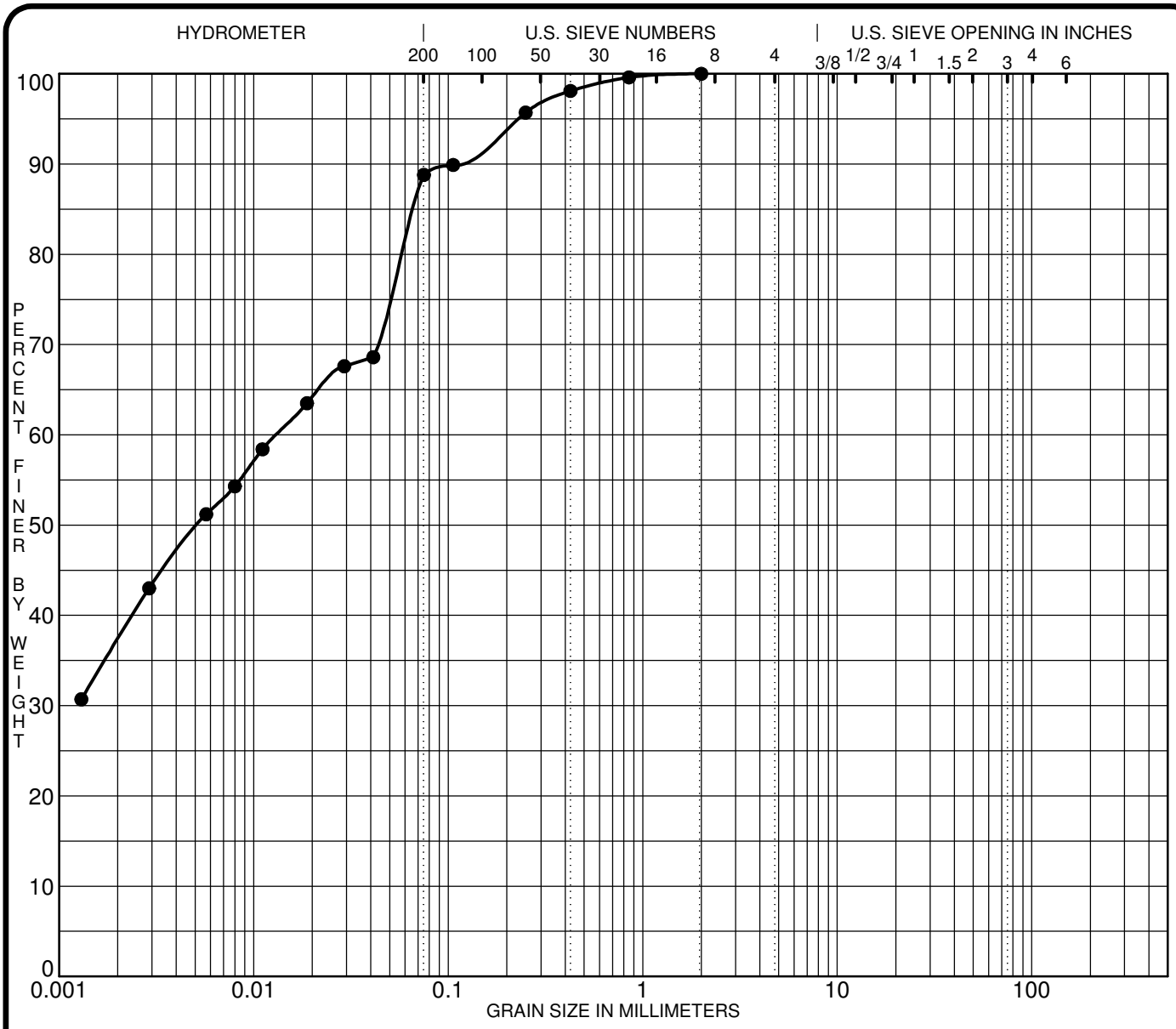
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH11-19 SS 4**	**2.00**	**0.00**			**0.0**	**1.7**	**98.3**	

CLIENT **Minto Communities Inc.** FILE NO. **PG4135**

PROJECT **Geotechnical Investigation - Kanata Lakes Golf & Country Club** DATE **28 Feb 19**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH14-19 SS 5**	**CH - Inorganic clays of high plasticity**						

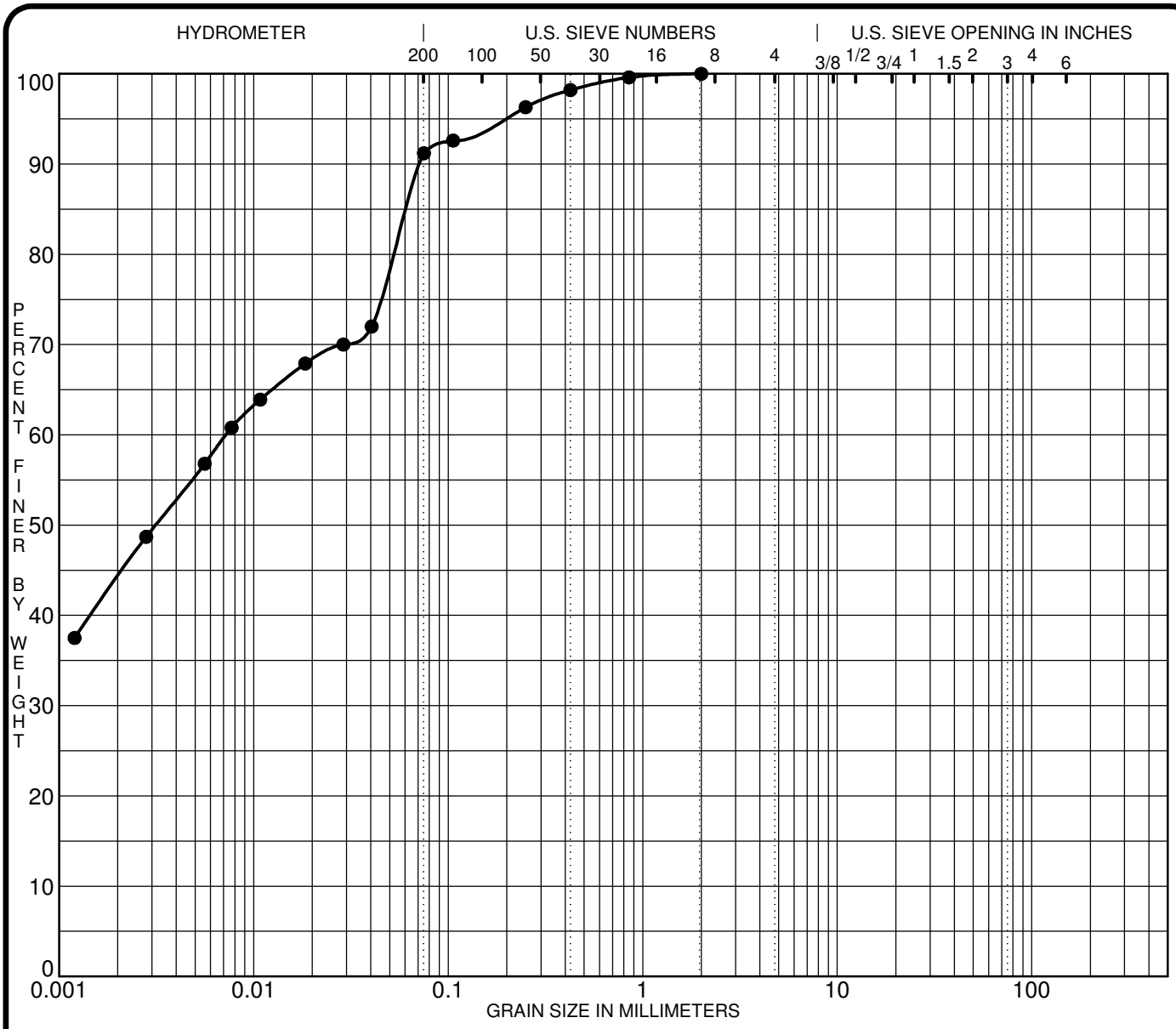
Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH14-19 SS 5**	**2.00**	**0.01**			**0.0**	**11.2**	**88.8**	

CLIENT **Minto Communities Inc.** FILE NO. **PG4135**

PROJECT **Geotechnical Investigation - Kanata Lakes Golf & Country Club** DATE **7 Mar 19**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION



SILT OR CLAY	SAND			GRAVEL		COBBLES
	fine	medium	coarse	fine	coarse	

Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
● **BH15-19 SS 4**	**CH - Inorganic clays of high plasticity**		**59**	**24**	**35**		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● **BH15-19 SS 4**	**2.00**	**0.01**			**0.0**	**8.8**	**91.2**	

CLIENT **Minto Communities Inc.** FILE NO. **PG4135**

PROJECT **Geotechnical Investigation - Kanata Lakes Golf & Country Club** DATE **8 Mar 19**

patersongroup Consulting Engineers
154 Colonnade Road South, Ottawa, Ontario K2E 7J5

GRAIN SIZE DISTRIBUTION

SYMBOLS AND TERMS

SOIL DESCRIPTION

Behavioural properties, such as structure and strength, take precedence over particle gradation in describing soils. Terminology describing soil structure are as follows:

Desiccated	-	having visible signs of weathering by oxidation of clay minerals, shrinkage cracks, etc.
Fissured	-	having cracks, and hence a blocky structure.
Varved	-	composed of regular alternating layers of silt and clay.
Stratified	-	composed of alternating layers of different soil types, e.g. silt and sand or silt and clay.
Well-Graded	-	Having wide range in grain sizes and substantial amounts of all intermediate particle sizes (see Grain Size Distribution).
Uniformly-Graded	-	Predominantly of one grain size (see Grain Size Distribution).

The standard terminology to describe the strength of cohesionless soils is the relative density, usually inferred from the results of the Standard Penetration Test (SPT) 'N' value. The SPT N value is the number of blows of a 63.5 kg hammer, falling 760 mm, required to drive a 51 mm O.D. split spoon sampler 300 mm into the soil after an initial penetration of 150 mm.

Relative Density	'N' Value	Relative Density %
Very Loose	<4	<15
Loose	4-10	15-35
Compact	10-30	35-65
Dense	30-50	65-85
Very Dense	>50	>85

The standard terminology to describe the strength of cohesive soils is the consistency, which is based on the undisturbed undrained shear strength as measured by the in situ or laboratory vane tests, penetrometer tests, unconfined compression tests, or occasionally by Standard Penetration Tests.

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

SYMBOLS AND TERMS (continued)

SOIL DESCRIPTION (continued)

Cohesive soils can also be classified according to their “sensitivity”. The sensitivity is the ratio between the undisturbed undrained shear strength and the remoulded undrained shear strength of the soil.

Terminology used for describing soil strata based upon texture, or the proportion of individual particle sizes present is provided on the Textural Soil Classification Chart at the end of this information package.

ROCK DESCRIPTION

The structural description of the bedrock mass is based on the Rock Quality Designation (RQD).

The RQD classification is based on a modified core recovery percentage in which all pieces of sound core over 100 mm long are counted as recovery. The smaller pieces are considered to be a result of closely-spaced discontinuities (resulting from shearing, jointing, faulting, or weathering) in the rock mass and are not counted. RQD is ideally determined from NXL size core. However, it can be used on smaller core sizes, such as BX, if the bulk of the fractures caused by drilling stresses (called “mechanical breaks”) are easily distinguishable from the normal in situ fractures.

RQD %	ROCK QUALITY
90-100	Excellent, intact, very sound
75-90	Good, massive, moderately jointed or sound
50-75	Fair, blocky and seamy, fractured
25-50	Poor, shattered and very seamy or blocky, severely fractured
0-25	Very poor, crushed, very severely fractured

SAMPLE TYPES

SS	-	Split spoon sample (obtained in conjunction with the performing of the Standard Penetration Test (SPT))
TW	-	Thin wall tube or Shelby tube
PS	-	Piston sample
AU	-	Auger sample or bulk sample
WS	-	Wash sample
RC	-	Rock core sample (Core bit size AXT, BXL, etc.). Rock core samples are obtained with the use of standard diamond drilling bits.

SYMBOLS AND TERMS (continued)

GRAIN SIZE DISTRIBUTION

MC%	-	Natural moisture content or water content of sample, %
LL	-	Liquid Limit, % (water content above which soil behaves as a liquid)
PL	-	Plastic limit, % (water content above which soil behaves plastically)
PI	-	Plasticity index, % (difference between LL and PL)
Dxx	-	Grain size which xx% of the soil, by weight, is of finer grain sizes These grain size descriptions are not used below 0.075 mm grain size
D10	-	Grain size at which 10% of the soil is finer (effective grain size)
D60	-	Grain size at which 60% of the soil is finer
Cc	-	Concavity coefficient = $(D30)^2$ / (D10 x D60)
Cu	-	Uniformity coefficient = D60 / D10

Cc and Cu are used to assess the grading of sands and gravels:
Well-graded gravels have: $1 < Cc < 3$ and $Cu > 4$
Well-graded sands have: $1 < Cc < 3$ and $Cu > 6$
Sands and gravels not meeting the above requirements are poorly-graded or uniformly-graded.
Cc and Cu are not applicable for the description of soils with more than 10% silt and clay
(more than 10% finer than 0.075 mm or the #200 sieve)

CONSOLIDATION TEST

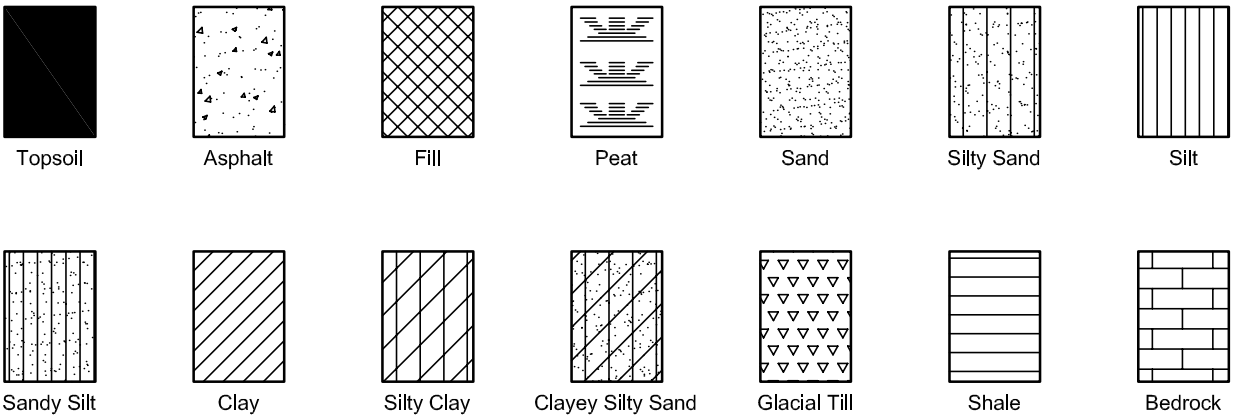
p'_o	-	Present effective overburden pressure at sample depth
p'_c	-	Preconsolidation pressure of (maximum past pressure on) sample
Ccr	-	Recompression index (in effect at pressures below p'_c)
Cc	-	Compression index (in effect at pressures above p'_c)
OC Ratio		Overconsolidaton ratio = p'_c / p'_o
Void Ratio		Initial sample void ratio = volume of voids / volume of solids
Wo	-	Initial water content (at start of consolidation test)

PERMEABILITY TEST

k	-	Coefficient of permeability or hydraulic conductivity is a measure of the ability of water to flow through the sample. The value of k is measured at a specified unit weight for (remoulded) cohesionless soil samples, because its value will vary with the unit weight or density of the sample during the test.

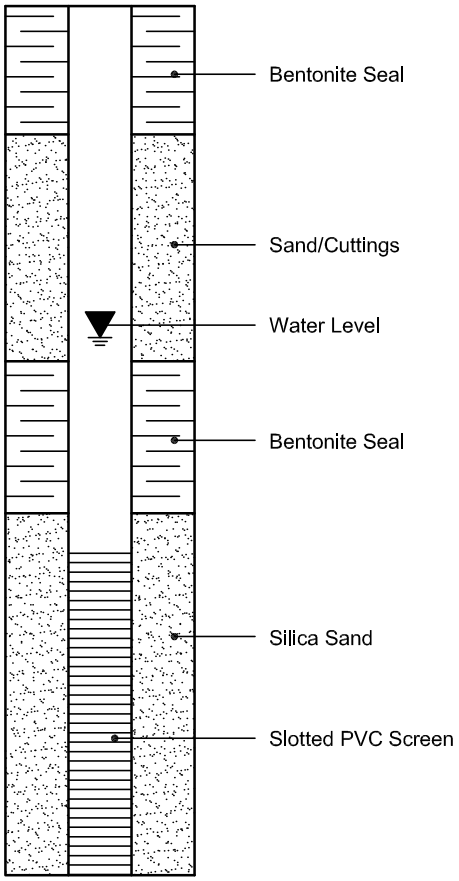
SYMBOLS AND TERMS (continued)

STRATA PLOT

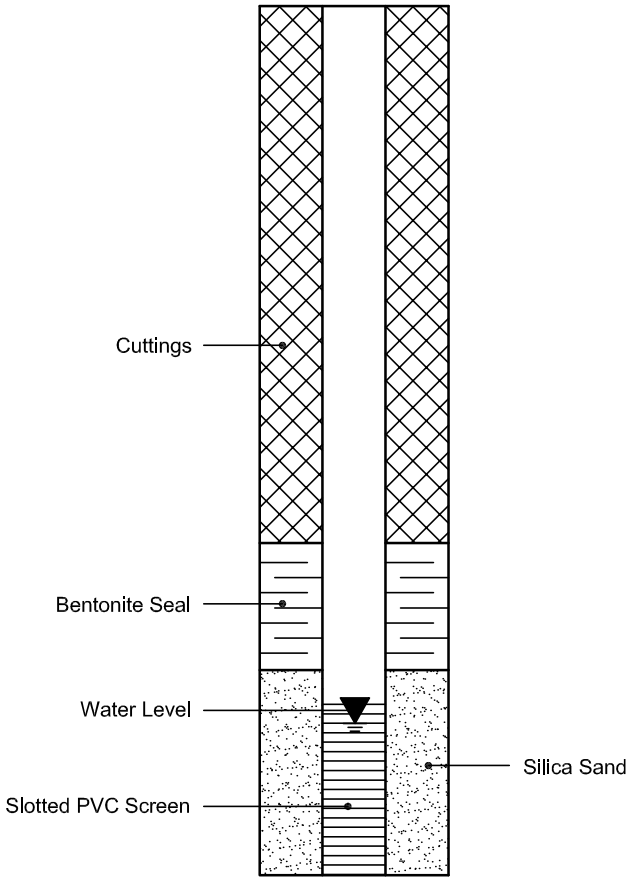


MONITORING WELL AND PIEZOMETER CONSTRUCTION

MONITORING WELL CONSTRUCTION



PIEZOMETER CONSTRUCTION



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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26044
Project: PE4321
Custody: 121015

Report Date: 11-Mar-2019
Order Date: 5-Mar-2019

Order #: 1910254

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

Paracel ID	Client ID
1910254-01	BH1-AU1
1910254-02	BH2-AU1
1910254-03	BH3-AU1
1910254-04	BH4-AU1
1910254-05	BH5-AU1/SS2

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26044

Report Date: 11-Mar-2019
Order Date: 5-Mar-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 8260 - P&T GC-MS	6-Mar-19	7-Mar-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	7-Mar-19	8-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	8-Mar-19	8-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	6-Mar-19	7-Mar-19
PHC F4G (gravimetric)	CWS Tier 1 - Extraction Gravimetric	7-Mar-19	7-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	6-Mar-19	6-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	7-Mar-19	7-Mar-19
Solids, %	Gravimetric, calculation	11-Mar-19	11-Mar-19

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26044

Report Date: 11-Mar-2019
Order Date: 5-Mar-2019
Project Description: PE4321

	Client ID:	BH1-AU1	BH2-AU1	BH3-AU1	BH4-AU1
	Sample Date:	02/27/2019 09:00	02/27/2019 09:00	02/26/2019 09:00	02/27/2019 09:00
	Sample ID:	1910254-01	1910254-02	1910254-03	1910254-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	94.0	96.3	97.0	80.1
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.4	1.2	1.1	2.4
Barium	1.0 ug/g dry	126	156	107	260
Beryllium	0.5 ug/g dry	0.8	<0.5	<0.5	0.6
Boron	5.0 ug/g dry	6.2	9.1	8.0	7.3
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	97.2	23.2	20.6	47.1
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	10.4	4.4	3.4	9.7
Copper	5.0 ug/g dry	11.2	6.4	6.0	18.1
Lead	1.0 ug/g dry	4.1	5.2	3.9	7.9
Mercury	0.1 ug/g dry	<0.1	0.2	<0.1	0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	30.9	11.4	8.6	21.5
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	49.0	19.5	12.2	45.6
Zinc	20.0 ug/g dry	52.4	20.3	<20.0	69.9
Volatiles					
Benzene	0.02 ug/g dry	-	<0.02	<0.02	-
Ethylbenzene	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene	0.05 ug/g dry	-	<0.05	<0.05	-
m,p-Xylenes	0.05 ug/g dry	-	<0.05	<0.05	-
o-Xylene	0.05 ug/g dry	-	<0.05	<0.05	-
Xylenes, total	0.05 ug/g dry	-	<0.05	<0.05	-
Toluene-d8	Surrogate	-	107%	107%	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	-	<7	<7	-
F2 PHCs (C10-C16)	4 ug/g dry	-	14	<4	-
F3 PHCs (C16-C34)	8 ug/g dry	-	47	47	-
F4 PHCs (C34-C50)	6 ug/g dry	-	26	149 [1]	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26044

Report Date: 11-Mar-2019
Order Date: 5-Mar-2019
Project Description: PE4321

	Client ID:	BH1-AU1	BH2-AU1	BH3-AU1	BH4-AU1
	Sample Date:	02/27/2019 09:00	02/27/2019 09:00	02/26/2019 09:00	02/27/2019 09:00
	Sample ID:	1910254-01	1910254-02	1910254-03	1910254-04
	MDL/Units	Soil	Soil	Soil	Soil
F4G PHCs (gravimetric)	50 ug/g dry	-	-	443	-
	Client ID:	BH5-AU1/SS2	-	-	-
	Sample Date:	02/27/2019 09:00	-	-	-
	Sample ID:	1910254-05	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	93.5	-	-	-
Volatiles					
Benzene	0.02 ug/g dry	<0.02	-	-	-
Ethylbenzene	0.05 ug/g dry	<0.05	-	-	-
Toluene	0.05 ug/g dry	<0.05	-	-	-
m,p-Xylenes	0.05 ug/g dry	<0.05	-	-	-
o-Xylene	0.05 ug/g dry	<0.05	-	-	-
Xylenes, total	0.05 ug/g dry	<0.05	-	-	-
Toluene-d8	Surrogate	107%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	7 ug/g dry	<7	-	-	-
F2 PHCs (C10-C16)	4 ug/g dry	<4	-	-	-
F3 PHCs (C16-C34)	8 ug/g dry	<8	-	-	-
F4 PHCs (C34-C50)	6 ug/g dry	<6	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g						
F2 PHCs (C10-C16)	ND	4	ug/g						
F3 PHCs (C16-C34)	ND	8	ug/g						
F4 PHCs (C34-C50)	ND	6	ug/g						
F4G PHCs (gravimetric)	ND	50	ug/g						
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						
Volatiles									
Benzene	ND	0.02	ug/g						
Ethylbenzene	ND	0.05	ug/g						
Toluene	ND	0.05	ug/g						
m,p-Xylenes	ND	0.05	ug/g						
o-Xylene	ND	0.05	ug/g						
Xylenes, total	ND	0.05	ug/g						
Surrogate: Toluene-d8	*7.98*		*ug/g*		*99.7*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	7	ug/g dry	ND				40	
F2 PHCs (C10-C16)	14	4	ug/g dry	14			2.2	30	
F3 PHCs (C16-C34)	49	8	ug/g dry	47			5.3	30	
F4 PHCs (C34-C50)	31	6	ug/g dry	26			18.2	30	
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.8	1.0	ug/g dry	2.4			15.4	30	
Barium	141	1.0	ug/g dry	126			11.5	30	
Beryllium	1.4	0.5	ug/g dry	0.8			57.1	30	QR-01
Boron	8.7	5.0	ug/g dry	6.2			33.5	30	QR-01
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	116	5.0	ug/g dry	97.2			17.7	30	
Cobalt	12.2	1.0	ug/g dry	10.4			16.4	30	
Copper	13.3	5.0	ug/g dry	11.2			17.0	30	
Lead	5.0	1.0	ug/g dry	4.1			19.8	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	36.8	5.0	ug/g dry	30.9			17.7	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	58.3	10.0	ug/g dry	49.0			17.2	30	
Zinc	61.5	20.0	ug/g dry	52.4			16.1	30	
Physical Characteristics									
% Solids	78.8	0.1	% by Wt.	78.4			0.4	25	
Volatiles									
Benzene	ND	0.02	ug/g dry	ND				50	
Ethylbenzene	ND	0.05	ug/g dry	ND				50	
Toluene	ND	0.05	ug/g dry	ND				50	
m,p-Xylenes	ND	0.05	ug/g dry	ND				50	
o-Xylene	ND	0.05	ug/g dry	ND				50	
Surrogate: Toluene-d8	*9.73*		*ug/g dry*		*105*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	173	7	ug/g		86.3	80-120			
F2 PHCs (C10-C16)	98	4	ug/g	14	101	60-140			
F3 PHCs (C16-C34)	273	8	ug/g	47	111	60-140			
F4 PHCs (C34-C50)	182	6	ug/g	26	121	60-140			
F4G PHCs (gravimetric)	960	50	ug/g		96.0	80-120			
Metals									
Antimony	43.9		ug/L	ND	87.6	70-130			
Arsenic	48.9		ug/L	1.0	95.8	70-130			
Barium	98.5		ug/L	50.2	96.6	70-130			
Beryllium	49.9		ug/L	ND	99.1	70-130			
Boron	48.5		ug/L	ND	92.0	70-130			
Cadmium	47.3		ug/L	ND	94.4	70-130			
Chromium (VI)	0.2		mg/L	ND	90.0	70-130			
Chromium	84.7		ug/L	38.9	91.5	70-130			
Cobalt	48.9		ug/L	4.2	89.5	70-130			
Copper	51.1		ug/L	ND	93.2	70-130			
Lead	45.9		ug/L	1.7	88.5	70-130			
Mercury	1.64	0.1	ug/g	ND	109	70-130			
Molybdenum	48.8		ug/L	ND	97.1	70-130			
Nickel	60.5		ug/L	12.3	96.3	70-130			
Selenium	46.1		ug/L	ND	91.9	70-130			
Silver	45.6		ug/L	ND	91.2	70-130			
Thallium	47.3		ug/L	ND	94.4	70-130			
Uranium	48.2		ug/L	ND	95.9	70-130			
Vanadium	69.4		ug/L	19.6	99.6	70-130			
Zinc	65.2		ug/L	20.9	88.5	70-130			
Volatiles									
Benzene	3.74	0.02	ug/g		93.6	60-130			
Ethylbenzene	3.61	0.05	ug/g		90.2	60-130			
Toluene	3.35	0.05	ug/g		83.6	60-130			
m,p-Xylenes	7.36	0.05	ug/g		92.0	60-130			
o-Xylene	3.63	0.05	ug/g		90.8	60-130			
Surrogate: Toluene-d8	*8.92*		*ug/g*		*111*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

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

QC Qualifiers :

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

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

CCME PHC additional information:

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

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RELIA

Paracel ID: 1910254

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Chain of Custody
(Lab Use Only)
Nº 121015

Page ___ of ___

Client Name: Paterson Group Inc.	Project Reference: PE4321
Contact Name: Karyn Munch	Quote #
Address: 154 Colonnade Road S.	PO # 260444
Telephone: 613-226-7381	Email Address: kmunch@patersongroup.ca

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

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

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

Required Analyses

Paracel Order Number: 1910254

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	MOE pesticides						
1	BH1-AU1 120	S		1	Feb.27/19					✓	✓	✓								
2	BH2-AU1	S		2	Feb.27/19		✓			✓	✓	✓								
3	BH3-AU1	S		2	Feb.26/19		✓			✓	✓	✓		✓						
4	BH4-AU1	S		1	Feb.27/19					✓	✓									
5	BH5-AU1/SS2	S		2	Feb.27/19		✓							✓	- MISSING -					
6	BH6-AU1	S		1	Feb.26/19									✓						
7	BH8-AU1 120	S		1	Feb.25/19									✓	Rec'd Monday 5/3					
8	BH10-AU1 120	S		1	Feb.28/19															
9																				
10																				

Comments:

Method of Delivery: Paracel Courier

Relinquished By (Sign): KMunch	Received by Driver/Depot: T. Scouse	Received at Lab: Heather Hood	Verified By: Heather Hood
Relinquished By (Print): K Munch	Date/Time: 05/03/19 4:15 PM	Date/Time: 05/03/19 17:12	Date/Time: 05/03/19 17:12
Date/Time:	Temperature: °C	Temperature: 16.8 °C	pH Verified [ ] By:

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Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Tel: (613) 226-7381
Fax: (613) 226-6344

Paracel Report No	**1910254**
Client Project(s):	**PE4321**
Client PO:	**26044**
Reference:	**Standing Offer**
CoC Number:	**121015**

Order Date:	05-Mar-19
Report Date:	11-Mar-19

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
1910254-03	BH3-AU1	Pesticides - Organochlorine in soil
1910254-06	BH6-AU1	Pesticides - Organochlorine in soil
1910254-07	BH8-AU1	Pesticides - Organochlorine in soil
1910254-08	BH10-AU1	Pesticides - Organochlorine in soil

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CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	367262
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd.	Regulation:	O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
	Ottawa, ON, K1G 4J8	Project #:	1910254
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	3/12/2019	Analysis Started:	3/15/2019
Arrival Temperature:	7 °C	Analysis Completed:	3/19/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH3-AU1	1421877	Soil	None		2/26/2019	
BH6-AU1	1421878	Soil	None		2/26/2019	
BH8-AU1	1421879	Soil	None		2/25/2019	
BH10-AU1	1421880	Soil	None		2/28/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In House
OCPs Soil (A19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

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Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367262

This report has been approved by:

Khaled Omari, Ph.D.
Laboratory Director

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367262

WORK ORDER RESULTS

Sample Description	BH3 - AU1		BH6 - AU1		BH8 - AU1		BH10 - AU1			
Lab ID	1421877		1421878		1421879		1421880			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
% Moisture	2.8	0.1	35.4	0.1	25.8	0.1	15.9	0.1	%	~

Sample Description	BH3 - AU1		BH6 - AU1		BH8 - AU1		BH10 - AU1			
Lab ID	1421877		1421878		1421879		1421880			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
2,4'-DDD	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
2,4'-DDE	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
2,4'-DDT	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
4,4'-DDD	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
4,4'-DDE	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
4,4'-DDT	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
Aldrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
DDD (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
DDE (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
DDT (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	1.4
Decachlorobiphenyl (Surr.)	74	N/A	76	N/A	73	N/A	93	N/A	% Rec	~
Dieldrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
Endosulfan I	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
Endosulfan I + II (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.04
Endosulfan II	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
Endosulfan sulfate	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367262

Sample Description	BH3 - AU1		BH6 - AU1		BH8 - AU1		BH10 - AU1			
Lab ID	1421877		1421878		1421879		1421880			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Endrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.04
Endrin aldehyde	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
Heptachlor	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
Heptachlor epoxide	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
Hexachlorobenzene	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.01
Hexachlorobutadiene	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.01
Hexachloroethane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.01
Methoxychlor	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
Mirex	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
Oxychlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
ß-BHC	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
α - Chlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
α + γ -Chlordane (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.05
α-BHC	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
γ - Chlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	~
γ-BHC (Lindane)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.01	0.01	µg/g	0.01
δ-BHC	<0.01	0.01	<0.009	0.009	<0.04	0.04	<0.04	0.04	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367262

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26046
Project: PE4321
Custody: 121038

Report Date: 18-Mar-2019
Order Date: 12-Mar-2019

Order #: 1911240

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

Paracel ID	Client ID
1911240-01	BH13-SS3

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26046

Report Date: 18-Mar-2019
Order Date: 12-Mar-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	15-Mar-19	15-Mar-19
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	15-Mar-19	15-Mar-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	15-Mar-19	15-Mar-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	15-Mar-19	15-Mar-19
Solids, %	Gravimetric, calculation	14-Mar-19	14-Mar-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26046

Report Date: 18-Mar-2019

Order Date: 12-Mar-2019

Project Description: PE4321

	Client ID:	BH13-SS3	-	-	-
	Sample Date:	03/06/2019 09:00	-	-	-
	Sample ID:	1911240-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	85.9	-	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	-	-	-
Arsenic	1.0 ug/g dry	1.2	-	-	-
Barium	1.0 ug/g dry	36.4	-	-	-
Beryllium	0.5 ug/g dry	<0.5	-	-	-
Boron	5.0 ug/g dry	<5.0	-	-	-
Boron, available	0.5 ug/g dry	<0.5	-	-	-
Cadmium	0.5 ug/g dry	<0.5	-	-	-
Chromium	5.0 ug/g dry	12.2	-	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	3.9	-	-	-
Copper	5.0 ug/g dry	9.7	-	-	-
Lead	1.0 ug/g dry	1.9	-	-	-
Mercury	0.1 ug/g dry	<0.1	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	-	-	-
Nickel	5.0 ug/g dry	6.6	-	-	-
Selenium	1.0 ug/g dry	<1.0	-	-	-
Silver	0.3 ug/g dry	<0.3	-	-	-
Thallium	1.0 ug/g dry	<1.0	-	-	-
Uranium	1.0 ug/g dry	<1.0	-	-	-
Vanadium	10.0 ug/g dry	24.2	-	-	-
Zinc	20.0 ug/g dry	<20.0	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26046

Report Date: 18-Mar-2019
Order Date: 12-Mar-2019
Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g dry	ND			0.0	30	
Arsenic	2.6	1.0	ug/g dry	2.5			6.8	30	
Barium	167	1.0	ug/g dry	166			0.6	30	
Beryllium	1.0	0.5	ug/g dry	0.9			2.8	30	
Boron, available	7.03	0.5	ug/g dry	7.19			2.2	35	
Boron	7.5	5.0	ug/g dry	7.3			3.5	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	40.8	5.0	ug/g dry	40.3			1.0	30	
Cobalt	11.5	1.0	ug/g dry	10.7			7.0	30	
Copper	14.9	5.0	ug/g dry	14.2			4.5	30	
Lead	7.2	1.0	ug/g dry	7.3			1.6	30	
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	21.9	5.0	ug/g dry	21.3			2.8	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	0.3	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	55.9	10.0	ug/g dry	55.3			1.1	30	
Zinc	66.4	20.0	ug/g dry	67.5			1.7	30	
Physical Characteristics									
% Solids	83.3	0.1	% by Wt.	83.8			0.6	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	41.5		ug/L	ND	82.8	70-130			
Arsenic	44.9		ug/L	1.0	87.8	70-130			
Barium	118		ug/L	66.4	102	70-130			
Beryllium	46.0		ug/L	ND	91.2	70-130			
Boron, available	12.0	0.5	ug/g	7.19	97.1	70-122			
Boron	44.8		ug/L	ND	83.7	70-130			
Cadmium	44.2		ug/L	ND	88.3	70-130			
Chromium (VI)	0.2		mg/L	ND	89.5	70-130			
Chromium	59.9		ug/L	16.1	87.5	70-130			
Cobalt	45.8		ug/L	4.3	83.1	70-130			
Copper	50.4		ug/L	5.7	89.3	70-130			
Lead	45.9		ug/L	2.9	85.9	70-130			
Mercury	1.44	0.1	ug/g	ND	95.8	70-130			
Molybdenum	44.0		ug/L	ND	87.8	70-130			
Nickel	53.6		ug/L	8.5	90.1	70-130			
Selenium	43.5		ug/L	ND	86.5	70-130			
Silver	43.4		ug/L	ND	86.6	70-130			
Thallium	41.6		ug/L	ND	82.9	70-130			
Uranium	43.3		ug/L	ND	85.9	70-130			
Vanadium	70.1		ug/L	22.1	95.9	70-130			
Zinc	70.0		ug/L	27.0	86.1	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

Paracel ID: 1911240

PARACEL LABORATORIES LTD.

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Ottawa, Ontario K1G 4J8
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e: paracel@paracellabs.com

Chain of Custody
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№ 121038

Page __ of __

Client Name: Paterson Group Inc.	Project Reference: PE4321
Contact Name: Karyn Munch	Quote #
Address: 154 Colonnade Rd S.	PO # 26046
Telephone: 613.226.7381	Email Address: kmunch@patersongroup.ca

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

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

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

Paracel Order Number: 1911240

Required Analyses

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH13-SS3	S		1	Mar. 6/19					✓	✓	✓	✓			1 120ml				/
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments: For on LID & CRACKED.

Method of Delivery: Paracel

Relinquished By (Sign): [signature]	Received by Driver/Depot: [signature]	Received at Lab: SUMPEPORN POKMAI	Verified By: [signature]
Relinquished By (Print): Mark St Pierre	Date/Time: 12/03/19 4:00	Date/Time: MAR 12, 2019 05:04	Date/Time: MAR 12, 19 5:10
Date/Time:	Temperature: °C PH	Temperature: 16.8 °C	pH Verified [ ] By:

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Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Tel: (613) 226-7381
Fax: (613) 226-6344

Paracel Report No	**1911246**
Client Project(s):	**PE4321**
Client PO:	**26046**
Reference:	**Standing Offer**
CoC Number:	

Order Date:	12-Mar-19
Report Date:	19-Mar-19

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
1911246-01	BH9-AU1	Pesticides - Organochlorine in soil
1911246-02	BH12-AU1	Pesticides - Organochlorine in soil
1911246-03	BH13-AU1	Pesticides - Organochlorine in soil
1911246-04	BH15-AU1	Pesticides - Organochlorine in soil

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CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	367480
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd. Ottawa, ON, K1G 4J8	Regulation: Project #:	None 1911246
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	3/14/2019	Analysis Started:	3/15/2019
Arrival Temperature:	10 °C	Analysis Completed:	3/19/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH9-AU1	1422443	Soil	None		2/27/2019	
BH12-AU1	1422444	Soil	None		2/28/2019	
BH13-AU1	1422445	Soil	None		3/6/2019	
BH15-AU1	1422446	Soil	None		3/8/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In House
OCPs Soil (A19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367480

This report has been approved by:

Khaled Omari, Ph.D.
Laboratory Director

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Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367480

WORK ORDER RESULTS

Sample Description	BH9 - AU1		BH12 - AU1		BH13 - AU1		BH15 - AU1			
Lab ID	1422443		1422444		1422445		1422446			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: [No Reg - Always Include Reg Report]
% Moisture	22.4	0.1	21.7	0.1	36.9	0.1	38.4	0.1	%	~

Sample Description	BH9 - AU1		BH12 - AU1		BH13 - AU1		BH15 - AU1			
Lab ID	1422443		1422444		1422445		1422446			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: [No Reg - Always Include Reg Report]
2,4'-DDD	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
2,4'-DDE	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
2,4'-DDT	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
4,4'-DDD	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
4,4'-DDE	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
4,4'-DDT	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Aldrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
DDD (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
DDE (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
DDT (Total) (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Decachlorobiphenyl (Surr.)	94	N/A	91	N/A	91	N/A	81	N/A	% Rec	~
Dieldrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Endosulfan I	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Endosulfan I + II (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Endosulfan II	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Endosulfan sulfate	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Endrin	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~

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Work Order Number: 367480

Sample Description	BH9 - AU1		BH12 - AU1		BH13 - AU1		BH15 - AU1			
Lab ID	1422443		1422444		1422445		1422446			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: [No Reg - Always Include Reg Report]
Endrin aldehyde	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Heptachlor	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Heptachlor epoxide	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Hexachlorobenzene	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Hexachlorobutadiene	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Hexachloroethane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Methoxychlor	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Mirex	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
Oxychlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
ß-BHC	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
α - Chlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
α + γ -Chlordane (Calc.)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
α-BHC	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
γ - Chlordane	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
γ-BHC (Lindane)	<0.01	0.01	<0.009	0.009	<0.009	0.009	<0.008	0.008	µg/g	~
δ-BHC	<0.04	0.04	<0.009	0.009	<0.09	0.09	<0.008	0.008	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367480

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

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Subcontracted Analysis

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Attn: Karyn Munch

Tel: (613) 226-7381
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Paracel Report No1912143
Client Project(s): PE4321
Client PO: 26047
Reference: Standing Offer
CoC Number: 121047

Order Date: 18-Mar-19
Report Date: 22-Mar-19

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	
1912143-01	BH17-AU1	Pesticides - Organochlorine in soil
1912143-02	BH20-AU1	Pesticides - Organochlorine in soil

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CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	367840
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd.	Regulation:	O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
	Ottawa, ON, K1G 4J8	Project #:	1912143
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	3/20/2019	Analysis Started:	3/21/2019
Arrival Temperature:	8 °C	Analysis Completed:	3/22/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH17-AU1	1423878	Soil	None		3/13/2019	
BH20-AU1	1423879	Soil	None		3/11/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In House
OCPs Soil (A19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

This report has been approved by:

Khaled Omari, Ph.D.
Laboratory Director

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367840

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367840

WORK ORDER RESULTS

Sample Description	BH17 - AU1		BH20 - AU1			
Lab ID	1423878		1423879			
General Chemistry	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
% Moisture	32.9	0.1	27.7	0.1	%	~

Sample Description	BH17 - AU1		BH20 - AU1			
Lab ID	1423878		1423879			
OC Pesticides	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
2,4'-DDD	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDE	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDT	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDD	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDE	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDT	<0.01	0.01	<0.01	0.01	µg/g	~
Aldrin	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDD (Total) (Calc.)	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDE (Total) (Calc.)	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDT (Total) (Calc.)	<0.01	0.01	<0.01	0.01	µg/g	1.4
Decachlorobiphenyl (Surr.)	56	N/A	63	N/A	% Rec	~
Dieldrin	<0.01	0.01	<0.01	0.01	µg/g	0.05
Endosulfan I	<0.01	0.01	<0.01	0.01	µg/g	~
Endosulfan I + II (Calc.)	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endosulfan II	<0.01	0.01	<0.01	0.01	µg/g	~
Endosulfan sulfate	<0.01	0.01	<0.01	0.01	µg/g	~

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Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367840

Sample Description	BH17 - AU1		BH20 - AU1			
Lab ID	1423878		1423879			
OC Pesticides	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Endrin	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endrin aldehyde	<0.01	0.01	<0.01	0.01	µg/g	~
Heptachlor	<0.01	0.01	<0.01	0.01	µg/g	0.05
Heptachlor epoxide	<0.01	0.01	<0.01	0.01	µg/g	0.05
Hexachlorobenzene	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachlorobutadiene	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachloroethane	<0.01	0.01	<0.01	0.01	µg/g	0.01
Methoxychlor	<0.01	0.01	<0.01	0.01	µg/g	0.05
Mirex	<0.01	0.01	<0.01	0.01	µg/g	~
Oxychlordane	<0.01	0.01	<0.01	0.01	µg/g	~
ß-BHC	<0.01	0.01	<0.01	0.01	µg/g	~
α - Chlordane	<0.01	0.01	<0.01	0.01	µg/g	~
α + γ -Chlordane (Calc.)	<0.01	0.01	<0.01	0.01	µg/g	0.05
α-BHC	<0.01	0.01	<0.01	0.01	µg/g	~
γ - Chlordane	<0.01	0.01	<0.01	0.01	µg/g	~
γ-BHC (Lindane)	<0.01	0.01	<0.01	0.01	µg/g	0.01
δ-BHC	<0.05	0.05	<0.03	0.03	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 367840

LEGEND

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MDL: Method detection limit or minimum reporting limit.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26504
Project: PE4321
Custody: 121681

Report Date: 7-May-2019
Order Date: 1-May-2019

Order #: 1918392

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

Paracel ID	Client ID
1918392-01	HA1-G1
1918392-03	HA5-G1
1918392-04	HA7-G1
1918392-06	HA13-G1
1918392-07	HA15-G1
1918392-09	DUP

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26504

Report Date: 07-May-2019
Order Date: 1-May-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	2-May-19	7-May-19
Mercury by CVAA	EPA 7471B - CVAA, digestion	3-May-19	6-May-19
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	2-May-19	2-May-19
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	3-May-19	3-May-19
Solids, %	Gravimetric, calculation	6-May-19	6-May-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26504

Report Date: 07-May-2019

Order Date: 1-May-2019

Project Description: PE4321

	Client ID:	HA1-G1	HA5-G1	HA7-G1	HA13-G1
	Sample Date:	30-Apr-19 09:00	29-Apr-19 09:00	29-Apr-19 09:00	30-Apr-19 09:00
	Sample ID:	1918392-01	1918392-03	1918392-04	1918392-06
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	73.5	79.9	82.4	78.0
General Inorganics					
pH	0.05 pH Units	-	7.17	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Arsenic	1.0 ug/g dry	2.2	1.1	1.9	2.3
Barium	1.0 ug/g dry	129	45.9	85.7	232
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	0.7
Boron	5.0 ug/g dry	<5.0	<5.0	<5.0	<5.0
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	<0.5
Chromium	5.0 ug/g dry	37.7	14.5	22.3	48.0
Chromium (VI)	0.2 ug/g dry	<0.2	<0.2	<0.2	<0.2
Cobalt	1.0 ug/g dry	8.6	3.9	5.9	10.7
Copper	5.0 ug/g dry	14.2	9.3	13.6	20.9
Lead	1.0 ug/g dry	9.2	3.3	5.1	7.7
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1
Molybdenum	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Nickel	5.0 ug/g dry	19.1	7.5	13.0	24.4
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	<0.3
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Uranium	1.0 ug/g dry	<1.0	<1.0	<1.0	<1.0
Vanadium	10.0 ug/g dry	46.1	26.6	30.5	58.2
Zinc	20.0 ug/g dry	76.4	25.3	39.4	86.2

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26504

Report Date: 07-May-2019

Order Date: 1-May-2019

Project Description: PE4321

	Client ID:	HA15-G1	DUP	-	-
	Sample Date:	30-Apr-19 09:00	30-Apr-19 09:00	-	-
	Sample ID:	1918392-07	1918392-09	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	93.6	86.8	-	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	-	-
Arsenic	1.0 ug/g dry	<1.0	1.4	-	-
Barium	1.0 ug/g dry	25.7	92.7	-	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	-	-
Boron	5.0 ug/g dry	<5.0	<5.0	-	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	-	-
Chromium	5.0 ug/g dry	12.3	23.8	-	-
Chromium (VI)	0.2 ug/g dry	<0.2	-	-	-
Cobalt	1.0 ug/g dry	2.7	5.8	-	-
Copper	5.0 ug/g dry	5.6	12.7	-	-
Lead	1.0 ug/g dry	1.2	3.5	-	-
Mercury	0.1 ug/g dry	2.3	-	-	-
Molybdenum	1.0 ug/g dry	<1.0	<1.0	-	-
Nickel	5.0 ug/g dry	6.6	12.3	-	-
Selenium	1.0 ug/g dry	<1.0	<1.0	-	-
Silver	0.3 ug/g dry	<0.3	<0.3	-	-
Thallium	1.0 ug/g dry	<1.0	<1.0	-	-
Uranium	1.0 ug/g dry	<1.0	<1.0	-	-
Vanadium	10.0 ug/g dry	12.0	34.5	-	-
Zinc	20.0 ug/g dry	25.1	37.4	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26504

Report Date: 07-May-2019
Order Date: 1-May-2019
Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium (VI)	ND	0.2	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
pH	7.86	0.05	pH Units	7.75			1.4	10	
Metals									
Antimony	1.5	1.0	ug/g dry	ND			0.0	30	
Arsenic	3.7	1.0	ug/g dry	4.1			9.4	30	
Barium	41.1	1.0	ug/g dry	37.1			10.3	30	
Beryllium	ND	0.5	ug/g dry	ND			0.0	30	
Boron	7.3	5.0	ug/g dry	6.5			11.8	30	
Cadmium	ND	0.5	ug/g dry	ND			0.0	30	
Chromium (VI)	ND	0.2	ug/g dry	ND				35	
Chromium	11.4	5.0	ug/g dry	11.5			0.7	30	
Cobalt	4.0	1.0	ug/g dry	4.3			7.5	30	
Copper	14.1	5.0	ug/g dry	14.4			2.0	30	
Lead	10.9	1.0	ug/g dry	12.0			9.8	30	
Mercury	0.502	0.1	ug/g dry	0.525			4.4	30	
Molybdenum	ND	1.0	ug/g dry	ND			0.0	30	
Nickel	7.7	5.0	ug/g dry	7.9			3.3	30	
Selenium	ND	1.0	ug/g dry	ND			0.0	30	
Silver	ND	0.3	ug/g dry	ND			0.0	30	
Thallium	ND	1.0	ug/g dry	ND			0.0	30	
Uranium	ND	1.0	ug/g dry	ND			0.0	30	
Vanadium	20.5	10.0	ug/g dry	20.8			1.6	30	
Zinc	47.2	20.0	ug/g dry	47.9			1.4	30	
Physical Characteristics									
% Solids	86.0	0.1	% by Wt.	86.7			0.9	25	

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26504

Report Date: 07-May-2019
Order Date: 1-May-2019
Project Description: PE4321

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	42.5		ug/L	ND	83.6	70-130			
Arsenic	49.1		ug/L	2.3	93.5	70-130			
Barium	93.3		ug/L	47.2	92.3	70-130			
Beryllium	46.7		ug/L	ND	93.0	70-130			
Boron	45.8		ug/L	6.3	79.0	70-130			
Cadmium	46.4		ug/L	ND	92.7	70-130			
Chromium (VI)	0.01		mg/L	ND	5.00	70-130			QM-01
Chromium	52.9		ug/L	7.3	91.4	70-130			
Cobalt	48.4		ug/L	2.1	92.4	70-130			
Copper	54.3		ug/L	9.3	89.9	70-130			
Lead	83.9		ug/L	42.8	82.1	70-130			
Mercury	1.92	0.1	ug/g	0.525	92.9	70-130			
Molybdenum	44.8		ug/L	ND	89.0	70-130			
Nickel	48.4		ug/L	ND	87.2	70-130			
Selenium	47.7		ug/L	ND	94.9	70-130			
Silver	43.3		ug/L	ND	86.5	70-130			
Thallium	47.8		ug/L	ND	95.5	70-130			
Uranium	45.4		ug/L	ND	90.4	70-130			
Vanadium	57.2		ug/L	11.0	92.4	70-130			
Zinc	88.3		ug/L	46.0	84.5	70-130			

Qualifier Notes:

QC Qualifiers :

QM-01 : The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

Paracel ID: 1918392

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Chain of Custody
(Lab Use Only)
No 121681

Page ___ of ___

Client Name: Paterson Group Inc.	Project Reference: PE4321
Contact Name: Kaitlyn Munch	Quote #
Address: 154 Colonnade Rd S.	PO # 26504
Telephone: 613-226-7381	Email Address: kmuch@gmail.com

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

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

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

Required Analyses

Paracel Order Number: 1918392

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	HOT Boron Acidic	pH					
1	HA1-G1	S		1	Apr.30/19					✓	✓	✓								125mL
2	HA3-G1	S		1	Apr.30/19									✓						↓
3	HA5-G1	S		1	Apr.29/19					✓	✓	✓			✓					
4	HA7-G1	S		2	Apr.29/19					✓	✓	✓		✓						2x125mL
5	HA11-G1	S		1	Apr.30/19									✓						125mL
6	HA13-G1	S		1	Apr.30/19					✓	✓	✓								↓
7	HA15-G1	S		2	Apr.30/19					✓	✓	✓		✓						2x125mL
8	HA16-G1	S		1	Apr.30/19									✓						125mL
9	~~[illegible]~~	~~[illegible]~~																		
10	DUP	S		1	Apr.30/19					✓										125mL

Comments: NO.4, 1 Soil Jar Sample date on Jar read = APR 30, 2019. April 29, 19.
No 8, Sample date on Jar read = APR 30, 2019. Expected April 30, 19

Method of Delivery: Paracel

Relinquished By (Sign): Kmunch	Received by Driver/Depot: A. Crouse	Received at Lab: Dan Ma	Verified By:
Relinquished By (Print): K. Munch	Date/Time: 01/05/19 3:20 pm	Date/Time: May 01, 2019 09:06	Date/Time: May 1, 19
Date/Time: May 1, 2019	Temperature: °C	Temperature: 9.4 °C	pH Verified [ ] By:

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Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Tel: (613) 226-7381
Fax: (613) 226-6344

Paracel Report No	**1918392**
Client Project(s):	**PE4321**
Client PO:	**26504**
Reference:	**Standing Offer**
CoC Number:	**121681**

Order Date:	01-May-19
Report Date:	7-May-19

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
1918392-02	HA3-G1	Pesticides - Organochlorine in soil
1918392-04	HA7-G1	Pesticides - Organochlorine in soil
1918392-05	HA11-G1	Pesticides - Organochlorine in soil
1918392-07	HA15-G1	Pesticides - Organochlorine in soil
1918392-08	HA16-G1	Pesticides - Organochlorine in soil

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CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	371016
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd.	Regulation:	O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/Commer/Comm
	Ottawa, ON, K1G 4J8	Project #:	1918392
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	5/3/2019	Analysis Started:	5/7/2019
Arrival Temperature:	13 °C	Analysis Completed:	5/7/2019

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
HA3-G1	1434178	Soil	None		4/30/2019	
HA7-G1	1434179	Soil	None		4/29/2019	
HA11-G1	1434180	Soil	None		4/30/2019	
HA15-G1	1434181	Soil	None		4/30/2019	
HA16-G1	1434182	Soil	None		4/30/2019	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In House
OCPs Soil (A19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 371016

This report has been approved by:

Khaled Omari, Ph.D.
Laboratory Director

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Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 371016

WORK ORDER RESULTS

Sample Description	HA3 - G1		HA7 - G1		HA11 - G1		HA15 - G1			
Lab ID	1434178		1434179		1434180		1434181			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
% Moisture	22.2	0.1	19.8	0.1	24.2	0.1	4.2	0.1	%	~

Sample Description	HA16 - G1			
Lab ID	1434182			
General Chemistry	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
% Moisture	23.9	0.1	%	~

Sample Description	HA3 - G1		HA7 - G1		HA11 - G1		HA15 - G1			
Lab ID	1434178		1434179		1434180		1434181			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
2,4'-DDD	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDE	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
2,4'-DDT	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDD	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDE	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
4,4'-DDT	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Aldrin	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDD (Total) (Calc.)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDE (Total) (Calc.)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
DDT (Total) (Calc.)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	1.4

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Work Order Number: 371016

Sample Description	HA3 - G1		HA7 - G1		HA11 - G1		HA15 - G1			
Lab ID	1434178		1434179		1434180		1434181			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Decachlorobiphenyl (Surr.)	98	N/A	99	N/A	99	N/A	100	N/A	% Rec	~
Dieldrin	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Endosulfan I	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Endosulfan I + II (Calc.)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endosulfan II	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Endosulfan sulfate	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Endrin	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.04
Endrin aldehyde	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Heptachlor	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Heptachlor epoxide	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Hexachlorobenzene	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachlorobutadiene	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Hexachloroethane	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
Methoxychlor	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
Mirex	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
Oxychlordane	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
ß-BHC	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
α - Chlordane	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
α + γ -Chlordane (Calc.)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.05
α-BHC	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
γ - Chlordane	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	~
γ-BHC (Lindane)	<0.01	0.01	<0.01	0.01	<0.01	0.01	<0.01	0.01	µg/g	0.01
δ-BHC	0.01	0.01	<0.01	0.01	0.03	0.01	0.02	0.01	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 371016

Sample Description	HA16 - G1
Lab ID	1434182

OC Pesticides	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
2,4'-DDD	<0.01	0.01	µg/g	~
2,4'-DDE	<0.01	0.01	µg/g	~
2,4'-DDT	<0.01	0.01	µg/g	~
4,4'-DDD	<0.01	0.01	µg/g	~
4,4'-DDE	<0.01	0.01	µg/g	~
4,4'-DDT	<0.01	0.01	µg/g	~
Aldrin	<0.01	0.01	µg/g	0.05
DDD (Total) (Calc.)	<0.01	0.01	µg/g	0.05
DDE (Total) (Calc.)	<0.01	0.01	µg/g	0.05
DDT (Total) (Calc.)	<0.01	0.01	µg/g	1.4
Decachlorobiphenyl (Surr.)	88	N/A	% Rec	~
Dieldrin	<0.01	0.01	µg/g	0.05
Endosulfan I	<0.01	0.01	µg/g	~
Endosulfan I + II (Calc.)	<0.01	0.01	µg/g	0.04
Endosulfan II	<0.01	0.01	µg/g	~
Endosulfan sulfate	<0.01	0.01	µg/g	~
Endrin	<0.01	0.01	µg/g	0.04
Endrin aldehyde	<0.01	0.01	µg/g	~
Heptachlor	<0.01	0.01	µg/g	0.05
Heptachlor epoxide	<0.01	0.01	µg/g	0.05
Hexachlorobenzene	<0.01	0.01	µg/g	0.01
Hexachlorobutadiene	<0.01	0.01	µg/g	0.01
Hexachloroethane	<0.01	0.01	µg/g	0.01
Methoxychlor	<0.01	0.01	µg/g	0.05

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 371016

Sample Description	HA16 - G1
Lab ID	1434182

OC Pesticides	Result	MDL	Units	Criteria: O.Reg 153 Table 1 Soil Res/Park/Inst/Ind/ Commer/Comm
Mirex	<0.01	0.01	µg/g	~
Oxychlordane	<0.01	0.01	µg/g	~
ß-BHC	<0.01	0.01	µg/g	~
α - Chlordane	<0.01	0.01	µg/g	~
α + γ -Chlordane (Calc.)	<0.01	0.01	µg/g	0.05
α-BHC	<0.01	0.01	µg/g	~
γ - Chlordane	<0.01	0.01	µg/g	~
γ-BHC (Lindane)	<0.01	0.01	µg/g	0.01
δ-BHC	<0.01	0.01	µg/g	~

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26715
Project: PE4321
Custody: 122103

Report Date: 14-May-2019
Order Date: 8-May-2019

Order #: 1919380

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

Paracel ID	Client ID
1919380-01	AH14-G1

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26715

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	13-May-19	14-May-19
Solids, %	Gravimetric, calculation	13-May-19	13-May-19

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26715

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

	Client ID:	AH14-G1	-	-	-
	Sample Date:	30-Apr-19 14:55	-	-	-
	Sample ID:	1919380-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	84.1	-	-	-
Metals					
Mercury	0.1 ug/g dry	0.6	-	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26715

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g						

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26715

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g dry	ND			0.0	30	
Physical Characteristics									
% Solids	86.9	0.1	% by Wt.	87.6			0.8	25	

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26715

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	1.60	0.1	ug/g	ND	107	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

PARACEL LABORATORIES LTD.

Paracel ID: 1919380

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Ottawa, Ontario K1G 4J8
1-800-749-1947
paracel@paracellabs.com

Chain of Custody
(Lab Use Only)
No 122103

Page ___ of ___

Client Name: Paterson Group	Project Reference: PE4321
Contact Name: Karyn Munch	Quote #: [redacted]
Address: 154 Colonnade Rd. S.	PO #: 26715
Telephone: 613-226-7381	Email Address: kmunch@patersongroup.ca

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

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

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

Required Analyses

	Paracel Order Number: 1919380 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	AH14-G1	S		1	Apr 30/19	2:55 PM					X							120mL		✓
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: T. Louie	Received at Lab: Sumeeporn Polmngi	Verified By:
Relinquished By (Print):	Date/Time: 08/05/19 4:00 PM	Date/Time: May 8 2019 8:59	Date/Time: 05-8-19 17:54
Date/Time: May 8, 2019	Temperature: °C	Temperature: 16.2 °C	pH Verified [ ] By:

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 23311

Report Date: 22-Dec-2017
Order Date: 18-Dec-2017
Project Description: PG4135

	Client ID:	BH17 SS3	-	-	-
	Sample Date:	07-Dec-17	-	-	-
	Sample ID:	1751084-01	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	68.5	-	-	-
General Inorganics					
pH	0.05 pH Units	7.68	-	-	-
Resistivity	0.10 Ohm.m	39.6	-	-	-
Anions					
Chloride	5 ug/g dry	66	-	-	-
Sulphate	5 ug/g dry	35	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 25823

Report Date: 18-Mar-2019

Order Date: 12-Mar-2019

Project Description: PG4135

	Client ID:	BH7-19-SS3	BH16-19-SS4	-	-
	Sample Date:	02/25/2019 09:00	03/08/2019 09:00	-	-
	Sample ID:	1911250-01	1911250-02	-	-
	MDL/Units	Soil	Soil	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	71.4	72.6	-	-
General Inorganics					
pH	0.05 pH Units	7.72	6.54	-	-
Resistivity	0.10 Ohm.m	44.9	96.8	-	-
Anions					
Chloride	5 ug/g dry	21	11	-	-
Sulphate	5 ug/g dry	55	12	-	-

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26050
Project: PE4321
Custody: 121054

Report Date: 2-Apr-2019
Order Date: 25-Mar-2019

Order #: 1913159

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

Paracel ID	Client ID
1913159-01	BH3-GW1

Approved By: Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26050

Report Date: 02-Apr-2019
Order Date: 25-Mar-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	27-Mar-19	27-Mar-19
PHC F1	CWS Tier 1 - P&T GC-FID	26-Mar-19	27-Mar-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	27-Mar-19	27-Mar-19
REG 153: Pesticides, OC	EPA 8081B - GC-ECD	2-Apr-19	2-Apr-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26050

Report Date: 02-Apr-2019

Order Date: 25-Mar-2019

Project Description: PE4321

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	03/22/2019 09:00	-	-	-
	Sample ID:	1913159-01	-	-	-
	MDL/Units	Water	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-
Xylenes, total	0.5 ug/L	<0.5	-	-	-
Toluene-d8	Surrogate	111%	-	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	-	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	-	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	-	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	-	-	-
Pesticides, OC					
Aldrin	0.01 ug/L	<0.01	-	-	-
alpha-Chlordane	0.01 ug/L	<0.01	-	-	-
gamma-Chlordane	0.01 ug/L	<0.01	-	-	-
Chlordane	0.01 ug/L	<0.01	-	-	-
o,p'-DDD	0.01 ug/L	<0.01	-	-	-
p,p'-DDD	0.01 ug/L	<0.01	-	-	-
DDD	0.01 ug/L	<0.01	-	-	-
o,p'-DDE	0.01 ug/L	<0.01	-	-	-
p,p'-DDE	0.01 ug/L	<0.01	-	-	-
DDE	0.01 ug/L	<0.01	-	-	-
o,p'-DDT	0.01 ug/L	<0.01	-	-	-
p,p'-DDT	0.01 ug/L	<0.01	-	-	-
DDT	0.01 ug/L	<0.01	-	-	-
Dieldrin	0.01 ug/L	<0.01	-	-	-
Endosulfan I	0.01 ug/L	<0.01	-	-	-
Endosulfan II	0.01 ug/L	<0.01	-	-	-
Endosulfan I/II	0.01 ug/L	<0.01	-	-	-
Endrin	0.01 ug/L	<0.01	-	-	-
Heptachlor	0.01 ug/L	<0.01	-	-	-
Heptachlor epoxide	0.01 ug/L	<0.01	-	-	-
Hexachlorobenzene	0.01 ug/L	<0.01	-	-	-
Hexachlorobutadiene	0.01 ug/L	<0.01	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26050

Report Date: 02-Apr-2019

Order Date: 25-Mar-2019

Project Description: PE4321

	Client ID:	BH3-GW1	-	-	-
	Sample Date:	03/22/2019 09:00	-	-	-
	Sample ID:	1913159-01	-	-	-
	MDL/Units	Water	-	-	-
Hexachlorocyclohexane, gamma	0.01 ug/L	<0.01	-	-	-
Hexachloroethane	0.01 ug/L	<0.01	-	-	-
Methoxychlor	0.01 ug/L	<0.01	-	-	-
Decachlorobiphenyl	Surrogate	74.1%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Pesticides, OC									
Aldrin	ND	0.01	ug/L						
alpha-Chlordane	ND	0.01	ug/L						
gamma-Chlordane	ND	0.01	ug/L						
Chlordane	ND	0.01	ug/L						
o,p'-DDD	ND	0.01	ug/L						
p,p'-DDD	ND	0.01	ug/L						
DDD	ND	0.01	ug/L						
o,p'-DDE	ND	0.01	ug/L						
p,p'-DDE	ND	0.01	ug/L						
DDE	ND	0.01	ug/L						
o,p'-DDT	ND	0.01	ug/L						
p,p'-DDT	ND	0.01	ug/L						
DDT	ND	0.01	ug/L						
Dieldrin	ND	0.01	ug/L						
Endosulfan I	ND	0.01	ug/L						
Endosulfan II	ND	0.01	ug/L						
Endosulfan I/II	ND	0.01	ug/L						
Endrin	ND	0.01	ug/L						
Heptachlor	ND	0.01	ug/L						
Heptachlor epoxide	ND	0.01	ug/L						
Hexachlorobenzene	ND	0.01	ug/L						
Hexachlorobutadiene	ND	0.01	ug/L						
Hexachlorocyclohexane, gamma	ND	0.01	ug/L						
Hexachloroethane	ND	0.01	ug/L						
Methoxychlor	ND	0.01	ug/L						
Surrogate: Decachlorobiphenyl	*0.328*		*ug/L*		*65.5*	*50-140*			
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*91.1*		*ug/L*		*114*	*50-140*			

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*88.0*		*ug/L*		*110*	*50-140*			

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1730	25	ug/L		86.5	68-117			
F2 PHCs (C10-C16)	1420	100	ug/L		88.7	60-140			
F3 PHCs (C16-C34)	3700	100	ug/L		94.4	60-140			
F4 PHCs (C34-C50)	2120	100	ug/L		85.3	60-140			
Pesticides, OC									
Aldrin	0.59	0.01	ug/L		118	50-140			
alpha-Chlordane	0.55	0.01	ug/L		109	50-140			
gamma-Chlordane	0.55	0.01	ug/L		111	50-140			
o,p'-DDD	0.34	0.01	ug/L		67.7	50-140			
p,p'-DDD	0.66	0.01	ug/L		132	50-140			
o,p'-DDE	0.34	0.01	ug/L		67.9	50-140			
p,p'-DDE	0.51	0.01	ug/L		103	50-140			
Dieldrin	0.53	0.01	ug/L		107	50-140			
Endosulfan I	0.57	0.01	ug/L		114	50-140			
Endosulfan II	0.46	0.01	ug/L		91.0	50-140			
Endrin	0.15	0.01	ug/L		30.0	50-140			QS-02
Heptachlor	0.52	0.01	ug/L		104	50-140			
Heptachlor epoxide	0.47	0.01	ug/L		94.0	50-140			
Hexachlorobenzene	0.48	0.01	ug/L		96.0	50-140			
Hexachlorobutadiene	0.56	0.01	ug/L		113	50-140			
Hexachloroethane	0.50	0.01	ug/L		99.1	50-140			
Methoxychlor	0.48	0.01	ug/L		95.0	50-140			
Surrogate: Decachlorobiphenyl	*0.377*		*ug/L*		*75.4*	*50-140*			
Volatiles									
Benzene	33.3	0.5	ug/L		83.2	60-130			
Ethylbenzene	33.4	0.5	ug/L		83.5	60-130			
Toluene	31.6	0.5	ug/L		79.1	60-130			
m,p-Xylenes	65.0	0.5	ug/L		81.3	60-130			
o-Xylene	32.3	0.5	ug/L		80.8	60-130			

Qualifier Notes:

QC Qualifiers :

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

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№ 121054

Page ___ of ___

Client Name: Paterson Group Inc.	Project Reference: PE4321	**Turnaround Time:**
Contact Name: Kaitlyn Munch	Quote #	☐ 1 Day ☐ 3 Day
Address: 154 Colonnade Rd S.	PO # 26050	☐ 2 Day ☒ Regular
Telephone: 613-226-7381	Email Address: kmunch@patersongroup.ca	Date Required:

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 7 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☐ Other:

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

Required Analyses

Paracel Order Number: 1913159																					
	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	MOE pesticides							
1	BH3-GW1	GW		4	Mar. 22/19		✓							✓							
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

Comments: '-Sample ID on 4 Bottles read -BH3.

Method of Delivery: Paracel

Relinquished By (Sign):	Received by Driver/Depot: A Seguin	Received at Lab: Shahzad Rahimi
Relinquished By (Print): Nick Hammerschlag	Date/Time: 25/03/19 4:30 PM	Date/Time: Mar 25, 2019 05:05
Date/Time: March 25, 2019 4:30pm	Temperature: °C	Temperature: 16.8 °C

Verified By:
Date/Time: 3/25/19 17:10
pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26714
Project: PE4321
Custody: 122102

Report Date: 14-May-2019
Order Date: 8-May-2019

Order #: 1919376

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

Paracel ID	Client ID
1919376-01	BH8-GW1
1919376-02	BH11-GW1
1919376-03	BH13-GW1
1919376-04	BH17-GW1
1919376-05	BH20-GW1

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26714

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	8-May-19	9-May-19
REG 153: Pesticides, OC	EPA 8081B - GC-ECD	13-May-19	14-May-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26714

Report Date: 14-May-2019

Order Date: 8-May-2019

Project Description: PE4321

	Client ID:	BH8-GW1	BH11-GW1	BH13-GW1	BH17-GW1
	Sample Date:	29-Apr-19 10:30	30-Apr-19 09:15	29-Apr-19 13:20	29-Apr-19 12:30
	Sample ID:	1919376-01	1919376-02	1919376-03	1919376-04
	MDL/Units	Water	Water	Water	Water
Pesticides, OC					
Aldrin	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
alpha-Chlordane	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
gamma-Chlordane	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Chlordane	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
o,p'-DDD	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
p,p'-DDD	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
DDD	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
o,p'-DDE	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
p,p'-DDE	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
DDE	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
o,p'-DDT	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
p,p'-DDT	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
DDT	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Dieldrin	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Endosulfan I	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Endosulfan II	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Endosulfan I/II	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Endrin	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Heptachlor	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Heptachlor epoxide	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Hexachlorobenzene	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Hexachlorobutadiene	0.01 ug/L	0.20	0.08	<0.01	<0.01
Hexachlorocyclohexane, gamma	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Hexachloroethane	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Methoxychlor	0.01 ug/L	<0.01	<0.01	<0.01	<0.01
Decachlorobiphenyl	Surrogate	88.9%	88.7%	88.7%	98.5%

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26714

Report Date: 14-May-2019

Order Date: 8-May-2019

Project Description: PE4321

	Client ID:	BH20-GW1	-	-	-
	Sample Date:	30-Apr-19 16:00	-	-	-
	Sample ID:	1919376-05	-	-	-
	MDL/Units	Water	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Pesticides, OC					
Aldrin	0.01 ug/L	<0.01	-	-	-
alpha-Chlordane	0.01 ug/L	<0.01	-	-	-
gamma-Chlordane	0.01 ug/L	<0.01	-	-	-
Chlordane	0.01 ug/L	<0.01	-	-	-
o,p'-DDD	0.01 ug/L	<0.01	-	-	-
p,p'-DDD	0.01 ug/L	<0.01	-	-	-
DDD	0.01 ug/L	<0.01	-	-	-
o,p'-DDE	0.01 ug/L	<0.01	-	-	-
p,p'-DDE	0.01 ug/L	<0.01	-	-	-
DDE	0.01 ug/L	<0.01	-	-	-
o,p'-DDT	0.01 ug/L	<0.01	-	-	-
p,p'-DDT	0.01 ug/L	<0.01	-	-	-
DDT	0.01 ug/L	<0.01	-	-	-
Dieldrin	0.01 ug/L	<0.01	-	-	-
Endosulfan I	0.01 ug/L	<0.01	-	-	-
Endosulfan II	0.01 ug/L	<0.01	-	-	-
Endosulfan I/II	0.01 ug/L	<0.01	-	-	-
Endrin	0.01 ug/L	<0.01	-	-	-
Heptachlor	0.01 ug/L	<0.01	-	-	-
Heptachlor epoxide	0.01 ug/L	<0.01	-	-	-
Hexachlorobenzene	0.01 ug/L	<0.01	-	-	-
Hexachlorobutadiene	0.01 ug/L	<0.01	-	-	-
Hexachlorocyclohexane, gamma	0.01 ug/L	<0.01	-	-	-
Hexachloroethane	0.01 ug/L	<0.01	-	-	-
Methoxychlor	0.01 ug/L	<0.01	-	-	-
Decachlorobiphenyl	Surrogate	103%	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/L						
Pesticides, OC									
Aldrin	ND	0.01	ug/L						
alpha-Chlordane	ND	0.01	ug/L						
gamma-Chlordane	ND	0.01	ug/L						
Chlordane	ND	0.01	ug/L						
o,p'-DDD	ND	0.01	ug/L						
p,p'-DDD	ND	0.01	ug/L						
DDD	ND	0.01	ug/L						
o,p'-DDE	ND	0.01	ug/L						
p,p'-DDE	ND	0.01	ug/L						
DDE	ND	0.01	ug/L						
o,p'-DDT	ND	0.01	ug/L						
p,p'-DDT	ND	0.01	ug/L						
DDT	ND	0.01	ug/L						
Dieldrin	ND	0.01	ug/L						
Endosulfan I	ND	0.01	ug/L						
Endosulfan II	ND	0.01	ug/L						
Endosulfan I/II	ND	0.01	ug/L						
Endrin	ND	0.01	ug/L						
Heptachlor	ND	0.01	ug/L						
Heptachlor epoxide	ND	0.01	ug/L						
Hexachlorobenzene	ND	0.01	ug/L						
Hexachlorobutadiene	ND	0.01	ug/L						
Hexachlorocyclohexane, gamma	ND	0.01	ug/L						
Hexachloroethane	ND	0.01	ug/L						
Methoxychlor	ND	0.01	ug/L						
Surrogate: Decachlorobiphenyl	*0.555*		*ug/L*		*111*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26714

Report Date: 14-May-2019
Order Date: 8-May-2019
Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	0.25	0.1	ug/L	0.25			0.9	20	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	3.04	0.1	ug/L	0.25	92.7	70-130			
Pesticides, OC									
Aldrin	0.77	0.01	ug/L			50-140			
alpha-Chlordane	0.73	0.01	ug/L			50-140			
gamma-Chlordane	0.75	0.01	ug/L			50-140			
o,p'-DDD	0.45	0.01	ug/L		89.8	50-140			
p,p'-DDD	0.69	0.01	ug/L			50-140			
o,p'-DDE	0.50	0.01	ug/L		100	50-140			
p,p'-DDE	0.73	0.01	ug/L			50-140			
o,p'-DDT	0.44	0.01	ug/L		88.5	50-140			
p,p'-DDT	0.61	0.01	ug/L			50-140			
Dieldrin	0.77	0.01	ug/L			50-140			
Endosulfan I	0.77	0.01	ug/L			50-140			
Endosulfan II	0.73	0.01	ug/L			50-140			
Endrin	0.79	0.01	ug/L			50-140			
Heptachlor	0.73	0.01	ug/L			50-140			
Heptachlor epoxide	0.75	0.01	ug/L			50-140			
Hexachlorobenzene	0.61	0.01	ug/L			50-140			
Hexachlorobutadiene	0.68	0.01	ug/L			50-140			
Hexachlorocyclohexane, gamma	0.69	0.01	ug/L			50-140			
Hexachloroethane	0.53	0.01	ug/L			50-140			
Methoxychlor	0.60	0.01	ug/L			50-140			
Surrogate: Decachlorobiphenyl	*0.510*		*ug/L*		*102*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

PARACEL LABORATORIES LTD

Paracel ID: 1919376

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

Chain of Custody
(Lab Use Only)
No 122102

Page ___ of ___

Client Name: Paterson Group
Contact Name: Karyn Munch
Address: 154 Colonnade Rd. S.
Telephone: 613-226-7381

Project Reference: PE4321
Quote #
PO # 26714
Email Address: kmunch@patersongroup.ca

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

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

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

Required Analyses

Paracel Order Number: 1919376 (* sample ID on bottles)

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Pesticides (OCs)						
1	BH8-GW1 = BH8 (lead)	GW		1	Apr 29/19	10:30 AM								X						
2	BH11-GW1 = BH11			1	Apr 30/19	9:15 AM								X						
3	BH13-GW1 = BH13			1	Apr 29/19	1:20 PM								X						
4	BH17-GW1 = BH17			1	Apr 29/19	12:30 PM								X						
5	BH20-GW1 = BH20 - For 1L Amber glass			2	Apr 30/19	4:00 PM					X			X						
6																				
7																				
8																				
9																				
10																				

Comments: Signatures per COC

Method of Delivery: Paracel

Relinquished By (Sign): N. Sullivan	Received by Driver/Depot: A. Crouse	Received at Lab: Jumeporn Donmai	Verified By:
Relinquished By (Print): Nick Sullivan	Date/Time: 08/05/19 4:00 PM	Date/Time: May 08 2019 04:59	Date/Time: 05-08-19 17:02
Date/Time: May 8, 2019	Temperature: °C	Temperature: 16.2 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 26515
Project: PE4321
Custody: 122126

Report Date: 23-May-2019
Order Date: 17-May-2019

Order #: 1920828

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

Paracel ID	Client ID
1920828-01	BH2-GW1
1920828-02	Dup-GW

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26515

Report Date: 23-May-2019
Order Date: 17-May-2019
Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
BTEX by P&T GC-MS	EPA 624 - P&T GC-MS	20-May-19	20-May-19
PHC F1	CWS Tier 1 - P&T GC-FID	19-May-19	20-May-19
PHCs F2 to F4	CWS Tier 1 - GC-FID, extraction	22-May-19	22-May-19

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 26515

Report Date: 23-May-2019

Order Date: 17-May-2019

Project Description: PE4321

	Client ID:	BH2-GW1	Dup-GW	-	-
	Sample Date:	17-May-19 09:00	17-May-19 09:00	-	-
	Sample ID:	1920828-01	1920828-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	105%	106%	-	-
Hydrocarbons					
F1 PHCs (C6-C10)	25 ug/L	<25	<25	-	-
F2 PHCs (C10-C16)	100 ug/L	<100	<100	-	-
F3 PHCs (C16-C34)	100 ug/L	<100	<100	-	-
F4 PHCs (C34-C50)	100 ug/L	<100	<100	-	-

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26515

Report Date: 23-May-2019
Order Date: 17-May-2019
Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L						
F2 PHCs (C10-C16)	ND	100	ug/L						
F3 PHCs (C16-C34)	ND	100	ug/L						
F4 PHCs (C34-C50)	ND	100	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: Toluene-d8	*82.1*		*ug/L*		*103*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26515

Report Date: 23-May-2019
Order Date: 17-May-2019
Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	ND	25	ug/L	ND				30	
Volatiles									
Benzene	ND	0.5	ug/L	ND				30	
Ethylbenzene	ND	0.5	ug/L	ND				30	
Toluene	ND	0.5	ug/L	ND				30	
m,p-Xylenes	ND	0.5	ug/L	ND				30	
o-Xylene	ND	0.5	ug/L	ND				30	
Surrogate: Toluene-d8	*84.8*		*ug/L*		*106*	*50-140*			

Certificate of Analysis
Client: Paterson Group Consulting Engineers
Client PO: 26515

Report Date: 23-May-2019
Order Date: 17-May-2019
Project Description: PE4321

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Hydrocarbons									
F1 PHCs (C6-C10)	1810	25	ug/L		90.6	68-117			
F2 PHCs (C10-C16)	1370	100	ug/L		85.7	60-140			
F3 PHCs (C16-C34)	3700	100	ug/L		94.4	60-140			
F4 PHCs (C34-C50)	2070	100	ug/L		83.5	60-140			
Volatiles									
Benzene	41.3	0.5	ug/L		103	60-130			
Ethylbenzene	40.6	0.5	ug/L		102	60-130			
Toluene	38.0	0.5	ug/L		95.1	60-130			
m,p-Xylenes	86.6	0.5	ug/L		108	60-130			
o-Xylene	47.4	0.5	ug/L		118	60-130			
Surrogate: Toluene-d8	*75.2*		*ug/L*		*94.0*	*50-140*			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

CCME PHC additional information:

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

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Paracel ID: 1920828

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ttawa, Ontario K1G 4J8
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: paracel@paracellabs.com

Chain of Custody
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.No 122126

Page ___ of ___

Client Name: Paterson Group Inc.	Project Reference: PE4321
Contact Name: Kaylyn Munch	Quote #
Address: 154 Colonnade Rds.	PO # 26515
Telephone: (613)226-7381	Email Address: kmunch@patersongroup.ca

Turnaround Time:
☐ 1 Day ☒ 3 Day
☐ 2 Day ☐ Regular
Date Required: May 23

Criteria: ☒ O. Reg. 153/04 (As Amended) Table 3 ☐ RSC Filing ☐ O. Reg. 558/00 ☐ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☐ Other: _____

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

Paracel Order Number: 1920823

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)							
1	BH2-GW1	GW		3	May 17/19		✓													
2	DUP-GW	GW		3	May 17/19		✓													
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

Required Analyses

Comments:

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Jumeeporn Lokmoi	Verified By:
Relinquished By (Print):	Date/Time: May 17/19	Date/Time: May 17, 2019 04:04	Date/Time: 05-17-19 16:43
Date/Time:	Temperature: °C	Temperature: 16.8 °C	pH Verified [ ] By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29916
Project: PE4321
Custody: 126166, 165, 168, 169

Report Date: 12-May-2020
Order Date: 6-May-2020

Order #: 2019245

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

Paracel ID	Client ID
2019245-02	HA2B-20
2019245-03	HA3A-20
2019245-04	HA4A-20
2019245-05	HA5B-20
2019245-06	HA6A-20
2019245-07	HA7A-20
2019245-08	HA8B-20
2019245-09	HA9A-20
2019245-10	HA10B-20
2019245-11	HA11A-20
2019245-12	HA12A-20
2019245-13	HA13A-20
2019245-14	HA14B-20
2019245-15	HA15A-20
2019245-16	HA16B-20
2019245-17	HA17A-20
2019245-18	HA18A-20
2019245-19	HA19A-20
2019245-20	HA20A-20
2019245-22	HA22-20
2019245-23	HA23A-20
2019245-24	HA24B-20
2019245-25	HA25A-20
2019245-26	HA26A-20
2019245-27	HA27-20
2019245-28	HA28A-20
2019245-29	HA29B-20
2019245-30	HA30A-20
2019245-31	HA31B-20
2019245-32	HA32A-20

Approved By:

Dale Robertson, BSc
Laboratory Director

2019245-33	HA33B-20
2019245-34	HA34A-20

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29916

Report Date: 12-May-2020

Order Date: 6-May-2020

Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	12-May-20	12-May-20
Solids, %	Gravimetric, calculation	8-May-20	8-May-20

Certificate of Analysis

Report Date: 12-May-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 6-May-2020

Client PO: **29916**

Project Description: PE4321

	Client ID:	HA2B-20	HA3A-20	HA4A-20	HA5B-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-02	2019245-03	2019245-04	2019245-05
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	84.9	90.7	79.6	83.1
Metals					
Mercury	0.1 ug/g dry	<0.1	2.5	0.1	0.4

	Client ID:	HA6A-20	HA7A-20	HA8B-20	HA9A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-06	2019245-07	2019245-08	2019245-09
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	93.3	92.5	73.4	94.7
Metals					
Mercury	0.1 ug/g dry	1.9	0.5	<0.1	2.7

	Client ID:	HA10B-20	HA11A-20	HA12A-20	HA13A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-10	2019245-11	2019245-12	2019245-13
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	95.1	83.9	92.9	96.1
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	1.7	0.9

	Client ID:	HA14B-20	HA15A-20	HA16B-20	HA17A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-14	2019245-15	2019245-16	2019245-17
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	88.6	85.4	86.0	94.9
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	0.8

	Client ID:	HA18A-20	HA19A-20	HA20A-20	HA22-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-18	2019245-19	2019245-20	2019245-22
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	96.8	93.8	79.1	83.0
Metals					
Mercury	0.1 ug/g dry	0.5	2.0	0.1	<0.1

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29916

Project Description: PE4321

	Client ID:	HA23A-20	HA24B-20	HA25A-20	HA26A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-23	2019245-24	2019245-25	2019245-26
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.2	81.5	93.4	86.3
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	1.7	<0.1

	Client ID:	HA27-20	HA28A-20	HA29B-20	HA30A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-27	2019245-28	2019245-29	2019245-30
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.9	97.8	82.4	79.2
Metals					
Mercury	0.1 ug/g dry	0.2	<0.1	<0.1	<0.1

	Client ID:	HA31B-20	HA32A-20	HA33B-20	HA34A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2019245-31	2019245-32	2019245-33	2019245-34
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	81.4	88.6	77.4	79.2
Metals					
Mercury	0.1 ug/g dry	<0.1	2.6	0.1	<0.1

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29916

Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g						

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29916

Report Date: 12-May-2020

Order Date: 6-May-2020

Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	88.5	0.1	% by Wt.	87.3			1.4	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	1.64	0.1	ug/g	ND	109	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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Paracel ID: 2019245

Chain Of Custody
(Lab Use Only)
Nº 126166

Client Name: PATERSON	Project Ref: PE4321	Page 1 of 4
Contact Name: KARYN MUNCH	Quote #:	Turnaround Time
Address: 154 Colonnade Road	PO #: 29916	☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Telephone: 613-226-7381	E-mail: Kmunch@patersongroup.ca	Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	OC PESTICIDES					
1	HA1-20	S		1	MAY 4/20									X					
2	HA2B-20	↓		↓	↓						X								
3	HA3A-20										X			X					
4	HA4A-20										X								
5	HA5B-20										↓			↓					
6	HA6A-20																		
7	HA7A-20																		
8	HA8B-20																		
9	HA9A-20																		
10	HA10B-20	↓		↓	↓						↓			↓					

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Joshua Dempsey	Date/Time:	Date/Time: May 6/20 3:00p	Date/Time: May 6/20 4:40p
Date/Time: MAY 5/2020	Temperature: °C	Temperature: 7.4 °C	pH Verified: ☐ By: N/A

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Paracel ID: 2019245

ber

Chain Of Custody
(Lab Use Only)
Nº 126165

Client Name: PATERSON	Project Ref: PE4321	Page 2 of 4
Contact Name: KARYN MUNCH	Quote #:	**Turnaround Time**
Address: 154 Colonnade Road	PO #: 29916	☐ 1 day ☐ 3 day
	E-mail: Kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	OC PESTICIDES
1	HA11A-20	S		1	MAY 4/20						X			X
2	HA12A-20	↓		↓	↓						↓			↓
3	HA13A-20													
4	HA14B-20													
5	HA15A-20													
6	HA16B-20													↓
7	HA17A-20													↓
8	HA18A-20													
9	HA19A-20													X
10	HA20A-20	↓		↓	↓						↓			

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Joshua Poyer	Date/Time:	Date/Time: May 6/20 3:00p	Date/Time: May 6/20 4:40p
Date/Time: MAY 5/2020	Temperature: °C	Temperature: 7.4 °C	pH Verified: ☐ By: N/A

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Paracel ID: 2019245

Number (Lab Only)

Chain Of Custody
(Lab Use Only)
№ 126168

Client Name: PATERSON	Project Ref: PE4321	Page 3 of 4
Contact Name: KARYN MUNCH	Quote #:	**Turnaround Time**
Address: 154 Colonnade Road	PO #: 29916	☐ 1 day ☐ 3 day
	E-mail: Kmunch@patersongroup.ca	☐ 2 day ☑ Regular
Telephone: 613-226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☑ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	OC PESTICIDES
1	HA21B-20	S		1	May 4/20									X
2	HA22-20										X			
3	HA23A-20													
4	HA24B-20													
5	HA25A-20													X
6	HA26D-20													
7	HA27-20													
8	HA28A-20													
9	HA29B-20													
10	HA30A-20	↓		↓	↓						↓			

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Joshua Dwyer	Date/Time:	Date/Time: May 6/20 3:00p	Date/Time: May 6/20 4:40p
Date/Time: May 5/2020	Temperature: °C	Temperature: 7.4 °C	pH Verified: ☐ By: N/A

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Paracel ID: 2019245

Chain Of Custody
(Lab Use Only)
Nº 126169

Page 4 of 4

Client Name: PATERSON	Project Ref: PE4321
Contact Name: KARYN MUNCH	Quote #:
Address: 154 Colonnade Road	PO #: 29916
Telephone: 613-226-7381	E-mail: Kmunch@patersongroup.ca

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	OC PESTICIDES					
1 HA31B-20	S		1	MAY 4/20						X								
2 HA32A-20	↓		↓	↓						X			X					
3 HA33B-20										X								
4 HA34A-20										X			X					
5																		
6																		
7																		
8																		
9																		
10																		

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Jasmine Pompeo	Date/Time:	Date/Time: May 6/20 3:00p	Date/Time: May 6/20 4:40p
Date/Time: MAY 5/2020	Temperature: °C	Temperature: 7.4 °C	pH Verified: ☐ By: N/A

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www.paracellabs.com

Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Tel: (613) 226-7381
Fax: (613) 226-6344

Paracel Report No.	**2019245**
Client Project(s):	**PE4321**
Client PO:	**29916**
Reference:	**Standing Offer**
CoC Number:	**126166, 165, 168, 169**

Order Date:	06-May-20
Report Date:	13-May-20

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
2019245-01	HA1-20	Pesticides - Organochlorine in soil
2019245-03	HA3A-20	Pesticides - Organochlorine in soil
2019245-05	HA5B-20	Pesticides - Organochlorine in soil
2019245-06	HA6A-20	Pesticides - Organochlorine in soil
2019245-07	HA7A-20	Pesticides - Organochlorine in soil
2019245-08	HA8B-20	Pesticides - Organochlorine in soil
2019245-09	HA9A-20	Pesticides - Organochlorine in soil
2019245-10	HA10B-20	Pesticides - Organochlorine in soil
2019245-11	HA11A-20	Pesticides - Organochlorine in soil
2019245-12	HA12A-20	Pesticides - Organochlorine in soil
2019245-13	HA13A-20	Pesticides - Organochlorine in soil
2019245-14	HA14B-20	Pesticides - Organochlorine in soil
2019245-15	HA15A-20	Pesticides - Organochlorine in soil
2019245-16	HA16B-20	Pesticides - Organochlorine in soil
2019245-17	HA17A-20	Pesticides - Organochlorine in soil
2019245-19	HA19A-20	Pesticides - Organochlorine in soil
2019245-25	HA25A-20	Pesticides - Organochlorine in soil
2019245-32	HA32A-20	Pesticides - Organochlorine in soil
2019245-34	HA34A-20	Pesticides - Organochlorine in soil

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CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	399613
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd. Ottawa, ON, K1G 4J8	Regulation: Project #:	O.Reg 153 Table 3 Soil Stringent 2019245
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	5/8/2020	Analysis Started:	5/11/2020
Arrival Temperature:	9 °C	Analysis Completed:	5/13/2020

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
HA1-20	1535065	Soil	None		5/4/2020	
HA3A-20	1535066	Soil	None		5/4/2020	
HA5B-20	1535067	Soil	None		5/4/2020	
HA6A-20	1535068	Soil	None		5/4/2020	
HA7A-20	1535069	Soil	None		5/4/2020	
HA8B-20	1535070	Soil	None		5/4/2020	
HA9A-20	1535071	Soil	None		5/4/2020	
HA10B-20	1535072	Soil	None		5/4/2020	
HA11A-20	1535073	Soil	None		5/4/2020	
HA12A-20	1535074	Soil	None		5/4/2020	
HA13A-20	1535075	Soil	None		5/4/2020	
HA14B-20	1535076	Soil	None		5/4/2020	
HA15A-20	1535077	Soil	None		5/4/2020	
HA16B-20	1535078	Soil	None		5/4/2020	
HA17A-20	1535079	Soil	None		5/4/2020	
HA19A-20	1535080	Soil	None		5/4/2020	
HA25A-20	1535081	Soil	None		5/4/2020	

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Work Order Number: 399613

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
HA32A-20	1535082	Soil	None		5/4/2020	
HA34A-20	1535083	Soil	None		5/4/2020	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
Moisture (A99)	Garson	Determination of Percent Moisture	In-House
OCPs Soil (A19)	Garson	Determination of Organochlorine Pesticides in Soil by GC/ECD	Modified from SW846-8081B

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

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Work Order Number: 399613

WORK ORDER RESULTS

Sample Description	HA1 - 20		HA3A - 20		HA5B - 20		HA6A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535065		1535066		1535067		1535068			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
% Moisture	4.9	0.1	12.9	0.1	18.5	0.1	8.8	0.1	%	~

Sample Description	HA7A - 20		HA8B - 20		HA9A - 20		HA10B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535069		1535070		1535071		1535072			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
% Moisture	15.9	0.1	27.9	0.1	10.0	0.1	6.9	0.1	%	~

Sample Description	HA11A - 20		HA12A - 20		HA13A - 20		HA14B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535073		1535074		1535075		1535076			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
% Moisture	18.5	0.1	10.9	0.1	8.4	0.1	15.6	0.1	%	~

Sample Description	HA15A - 20		HA16B - 20		HA17A - 20		HA19A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535077		1535078		1535079		1535080			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
% Moisture	15.6	0.1	14.7	0.1	9.9	0.1	9.3	0.1	%	~

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Work Order Number: 399613

Sample Description	HA25A - 20		HA32A - 20		HA34A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535081		1535082		1535083			
General Chemistry	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
% Moisture	8.4	0.1	12.4	0.1	21.5	0.1	%	~

Sample Description	HA1 - 20		HA3A - 20		HA5B - 20		HA6A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535065		1535066		1535067		1535068			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
2,4'-DDD	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
2,4'-DDE	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
2,4'-DDT	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
4,4'-DDD	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
4,4'-DDE	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
4,4'-DDT	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Aldrin	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.05
DDD (Total) (Calc.)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	3.3
DDE (Total) (Calc.)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.26
DDT (Total) (Calc.)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	1.4
Decachlorobiphenyl (Surr.)	97 [69]	N/A	87	N/A	89	N/A	81	N/A	% Rec	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA1 - 20		HA3A - 20		HA5B - 20		HA6A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535065		1535066		1535067		1535068			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
Dieldrin	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.05
Endosulfan I	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Endosulfan I + II (Calc.)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.04
Endosulfan II	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Endosulfan sulfate	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Endrin	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.04
Endrin aldehyde	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Heptachlor	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.15
Heptachlor epoxide	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.05
Hexachlorobenzene	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.52
Hexachlorobutadiene	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.012
Hexachloroethane	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.071
Methoxychlor	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.13
Mirex	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
Oxychlordane	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
ß-BHC	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~

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Work Order Number: 399613

Sample Description	HA1 - 20		HA3A - 20		HA5B - 20		HA6A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535065		1535066		1535067		1535068			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
α - Chlordane	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
α + γ -Chlordane (Calc.)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.05
α-BHC	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
γ - Chlordane	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	~
γ-BHC (Lindane)	<0.008 [<0.009]	0.008	<0.009	0.009	<0.009	0.009	<0.009	0.009	µg/g	0.056
δ-BHC	0.053 [0.050]	0.008	0.057	0.009	0.044	0.009	0.056	0.009	µg/g	~

Sample Description	HA7A - 20		HA8B - 20		HA9A - 20		HA10B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535069		1535070		1535071		1535072			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
2,4'-DDD	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
2,4'-DDE	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
2,4'-DDT	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
4,4'-DDD	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
4,4'-DDE	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
4,4'-DDT	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Aldrin	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.05
DDD (Total) (Calc.)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	3.3
DDE (Total) (Calc.)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.26

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA7A - 20		HA8B - 20		HA9A - 20		HA10B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535069		1535070		1535071		1535072			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
DDT (Total) (Calc.)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	1.4
Decachlorobiphenyl (Surr.)	66	N/A	100	N/A	81	N/A	88	N/A	% Rec	~
Dieldrin	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.05
Endosulfan I	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Endosulfan I + II (Calc.)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.04
Endosulfan II	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Endosulfan sulfate	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Endrin	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.04
Endrin aldehyde	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Heptachlor	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.15
Heptachlor epoxide	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.05
Hexachlorobenzene	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.52
Hexachlorobutadiene	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.012
Hexachloroethane	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.071
Methoxychlor	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.13
Mirex	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
Oxychlordane	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
ß-BHC	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
α - Chlordane	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
α + γ -Chlordane (Calc.)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.05
α-BHC	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
γ - Chlordane	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	~
γ-BHC (Lindane)	<0.007	0.007	<0.009	0.009	<0.007	0.007	<0.009	0.009	µg/g	0.056

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Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA7A - 20		HA8B - 20		HA9A - 20		HA10B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535069		1535070		1535071		1535072			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
δ-BHC	0.052	0.007	0.051	0.009	0.055	0.007	0.011	0.009	µg/g	~

Sample Description	HA11A - 20		HA12A - 20		HA13A - 20		HA14B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535073		1535074		1535075		1535076			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
2,4'-DDD	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
2,4'-DDE	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
2,4'-DDT	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
4,4'-DDD	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
4,4'-DDE	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
4,4'-DDT	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
Aldrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.05
DDD (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	3.3
DDE (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.26
DDT (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	1.4
Decachlorobiphenyl (Surr.)	69	N/A	94	N/A	76	N/A	79	N/A	% Rec	~
Dieldrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.05
Endosulfan I	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
Endosulfan I + II (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.04
Endosulfan II	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
Endosulfan sulfate	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~

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Work Order Number: 399613

Sample Description	HA11A - 20		HA12A - 20		HA13A - 20		HA14B - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535073		1535074		1535075		1535076			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
Endrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.04
Endrin aldehyde	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
Heptachlor	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.15
Heptachlor epoxide	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.05
Hexachlorobenzene	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.52
Hexachlorobutadiene	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.012
Hexachloroethane	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.071
Methoxychlor	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.13
Mirex	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
Oxychlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
ß-BHC	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
α - Chlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
α + γ -Chlordane (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.05
α-BHC	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
γ - Chlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	~
γ-BHC (Lindane)	<0.008	0.008	<0.008	0.008	<0.009	0.009	<0.007	0.007	µg/g	0.056
δ-BHC	0.040	0.008	0.086	0.008	0.033	0.009	0.021	0.007	µg/g	~

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Work Order Number: 399613

Sample Description	HA15A - 20		HA16B - 20		HA17A - 20		HA19A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535077		1535078		1535079		1535080			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
2,4'-DDD	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
2,4'-DDE	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
2,4'-DDT	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
4,4'-DDD	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
4,4'-DDE	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
4,4'-DDT	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Aldrin	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.05
DDD (Total) (Calc.)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	3.3
DDE (Total) (Calc.)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.26
DDT (Total) (Calc.)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	1.4
Decachlorobiphenyl (Surr.)	78	N/A	59	N/A	60	N/A	66	N/A	% Rec	~
Dieldrin	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.05
Endosulfan I	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Endosulfan I + II (Calc.)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.04
Endosulfan II	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Endosulfan sulfate	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Endrin	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.04
Endrin aldehyde	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Heptachlor	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.15
Heptachlor epoxide	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.05
Hexachlorobenzene	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.52
Hexachlorobutadiene	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.012
Hexachloroethane	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.071

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Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA15A - 20		HA16B - 20		HA17A - 20		HA19A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535077		1535078		1535079		1535080			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
Methoxychlor	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.13
Mirex	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
Oxychlordane	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
ß-BHC	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
α - Chlordane	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
α + γ -Chlordane (Calc.)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.05
α-BHC	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
γ - Chlordane	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	~
γ-BHC (Lindane)	<0.007	0.007	<0.007	0.007	<0.008	0.008	<0.007	0.007	µg/g	0.056
δ-BHC	0.053	0.007	0.043	0.007	0.046	0.008	0.047	0.007	µg/g	~

Sample Description	HA25A - 20		HA32A - 20		HA34A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535081		1535082		1535083			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
2,4'-DDD	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
2,4'-DDE	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
2,4'-DDT	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
4,4'-DDD	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
4,4'-DDE	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
4,4'-DDT	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Aldrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.05

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Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA25A - 20		HA32A - 20		HA34A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535081		1535082		1535083			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
DDD (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	3.3
DDE (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.26
DDT (Total) (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	1.4
Decachlorobiphenyl (Surr.)	84	N/A	79	N/A	96	N/A	% Rec	~
Dieldrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.05
Endosulfan I	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Endosulfan I + II (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.04
Endosulfan II	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Endosulfan sulfate	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Endrin	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.04
Endrin aldehyde	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Heptachlor	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.15
Heptachlor epoxide	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.05
Hexachlorobenzene	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.52
Hexachlorobutadiene	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.012
Hexachloroethane	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.071
Methoxychlor	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.13
Mirex	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
Oxychlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
ß-BHC	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
α - Chlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
α + γ -Chlordane (Calc.)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.05
α-BHC	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~

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CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399613

Sample Description	HA25A - 20		HA32A - 20		HA34A - 20			
Sample Date	5/4/2020 12:00 AM		5/4/2020 12:00 AM		5/4/2020 12:00 AM			
Lab ID	1535081		1535082		1535083			
OC Pesticides	Result	MDL	Result	MDL	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Soil Stringent
γ - Chlordane	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	~
γ-BHC (Lindane)	<0.008	0.008	<0.008	0.008	<0.009	0.009	µg/g	0.056
δ-BHC	0.067	0.008	0.082	0.008	0.097	0.009	µg/g	~

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. If multiple re-runs exist they are suffixed by a number. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

[ ]: Results for laboratory replicates are shown in square brackets immediately below the associated sample result for ease of comparison.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29919
Project: PE4321
Custody: 126170

Report Date: 14-May-2020
Order Date: 11-May-2020

Order #: 2020017

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

Paracel ID	Client ID
2020017-01	HA23B-20
2020017-02	HA24A-20
2020017-03	HA25B-20
2020017-04	HA26A-20
2020017-05	HA28B-20
2020017-06	HA29A-20
2020017-07	HA30B-20
2020017-08	HA31A-20

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 14-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 11-May-2020

Client PO: 29919

Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	14-May-20	14-May-20
Solids, %	Gravimetric, calculation	12-May-20	12-May-20

Certificate of Analysis

Report Date: 14-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 11-May-2020

Client PO: 29919

Project Description: PE4321

	Client ID:	HA23B-20	HA24A-20	HA25B-20	HA26A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2020017-01	2020017-02	2020017-03	2020017-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	81.1	79.8	92.3	79.2
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

	Client ID:	HA28B-20	HA29A-20	HA30B-20	HA31A-20
	Sample Date:	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00	04-May-20 09:00
	Sample ID:	2020017-05	2020017-06	2020017-07	2020017-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.5	76.3	76.3	74.9
Metals					
Mercury	0.1 ug/g dry	1.0	0.2	<0.1	<0.1

Certificate of Analysis

Report Date: 14-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 11-May-2020

Client PO: 29919

Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g						

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29919

Report Date: 14-May-2020

Order Date: 11-May-2020

Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	77.8	0.1	% by Wt.	79.5			2.1	25	

Certificate of Analysis

Report Date: 14-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 11-May-2020

Client PO: 29919

Project Description: PE4321

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	1.74	0.1	ug/g	ND	116	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2020017	Nº 126170

Client Name: PATERSON
Project Ref: PE4321
Page 1 of 1

Contact Name: KARYN MUNCH
Quote #:

Address: 154 Colonnade Road
PO #: 29919

E-mail: Kmunch@patersongrp.ca

Telephone: 613-226-7381

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)
1	HA23B-20	S		1	MAY 4/20						X		
2	HA24A-20	↓		↓	↓						↓		
3	HA25B-20												
4	HA26A-20												
5	HA28B-20												
6	HA29A-20												
7	HA30B-20												
8	HA31A-20	↓		↓	↓						↓		
9													
10													

Comments:

Method of Delivery: Paracel

Relinquished By (Sign)	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Joshua Dempsey	Date/Time:	Date/Time: 11 May 2020 9:50	Date/Time: 05-11-2020 17
Date/Time: MAY 7 / 2020	Temperature: °C	Temperature: 6.3 °C	pH Verified: ☐ By:

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 29915
Project: PE4321
Custody: 126167

Report Date: 12-May-2020
Order Date: 6-May-2020

Order #: 2019231

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

Paracel ID	Client ID
2019231-01	BH8-19-GW
2019231-03	BH16-19-GW
2019231-04	BH18-19-GW
2019231-05	BH19-19-GW
2019231-06	BH20-19-GW

Approved By:

Dale Robertson, BSc
Laboratory Director

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29915

Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 245.2 - Cold Vapour AA	9-May-20	12-May-20
Metals, ICP-MS	EPA 200.8 - ICP-MS	12-May-20	12-May-20

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29915

Project Description: PE4321

	Client ID:	BH8-19-GW	BH16-19-GW	BH18-19-GW	BH19-19-GW
	Sample Date:	05-May-20 09:00	05-May-20 09:00	05-May-20 09:00	05-May-20 09:00
	Sample ID:	2019231-01	2019231-03	2019231-04	2019231-05
	MDL/Units	Water	Water	Water	Water
Metals					
Mercury	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Antimony	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Arsenic	1 ug/L	<1	<1	<1	<1
Barium	1 ug/L	76	47	50	131
Beryllium	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Boron	10 ug/L	26	<10	17	<10
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	0.6	1.0	<0.5
Copper	0.5 ug/L	4.9	0.8	13.7	<0.5
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Molybdenum	0.5 ug/L	1.8	0.6	10.8	<0.5
Nickel	1 ug/L	<1	<1	4	<1
Selenium	1 ug/L	<1	<1	<1	<1
Silver	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Sodium	200 ug/L	25100	6920	54500	25600
Thallium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Uranium	0.1 ug/L	0.7	0.4	0.9	<0.1
Vanadium	0.5 ug/L	1.2	0.6	0.5	0.9
Zinc	5 ug/L	<5	7	13	<5

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29915

Project Description: PE4321

	Client ID:	BH20-19-GW	-	-	-
	Sample Date:	05-May-20 09:00	-	-	-
	Sample ID:	2019231-06	-	-	-
	MDL/Units	Water	-	-	-
Metals					
Mercury	0.1 ug/L	<0.1	-	-	-
Antimony	0.5 ug/L	<0.5	-	-	-
Arsenic	1 ug/L	<1	-	-	-
Barium	1 ug/L	141	-	-	-
Beryllium	0.5 ug/L	<0.5	-	-	-
Boron	10 ug/L	79	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Chromium	1 ug/L	<1	-	-	-
Cobalt	0.5 ug/L	<0.5	-	-	-
Copper	0.5 ug/L	4.0	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Molybdenum	0.5 ug/L	2.6	-	-	-
Nickel	1 ug/L	<1	-	-	-
Selenium	1 ug/L	<1	-	-	-
Silver	0.1 ug/L	<0.1	-	-	-
Sodium	200 ug/L	80000	-	-	-
Thallium	0.1 ug/L	<0.1	-	-	-
Uranium	0.1 ug/L	0.6	-	-	-
Vanadium	0.5 ug/L	<0.5	-	-	-
Zinc	5 ug/L	6	-	-	-

Certificate of Analysis

Client: Paterson Group Consulting Engineers

Client PO: 29915

Report Date: 12-May-2020

Order Date: 6-May-2020

Project Description: PE4321

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/L						
Antimony	ND	0.5	ug/L						
Arsenic	ND	1	ug/L						
Barium	ND	1	ug/L						
Beryllium	ND	0.5	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Lead	ND	0.1	ug/L						
Molybdenum	ND	0.5	ug/L						
Nickel	ND	1	ug/L						
Selenium	ND	1	ug/L						
Silver	ND	0.1	ug/L						
Sodium	ND	200	ug/L						
Thallium	ND	0.1	ug/L						
Uranium	ND	0.1	ug/L						
Vanadium	ND	0.5	ug/L						
Zinc	ND	5	ug/L						

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/L	ND			NC	20	
Antimony	0.52	0.5	ug/L	ND			NC	20	
Arsenic	ND	1	ug/L	ND			NC	20	
Barium	78.6	1	ug/L	76.1			3.3	20	
Beryllium	ND	0.5	ug/L	ND			NC	20	
Boron	26	10	ug/L	26			0.2	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	5.01	0.5	ug/L	4.93			1.8	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Molybdenum	1.86	0.5	ug/L	1.78			4.3	20	
Nickel	ND	1	ug/L	ND			NC	20	
Selenium	ND	1	ug/L	ND			NC	20	
Silver	ND	0.1	ug/L	ND			NC	20	
Sodium	24900	200	ug/L	25100			1.0	20	
Thallium	ND	0.1	ug/L	ND			NC	20	
Uranium	0.7	0.1	ug/L	0.7			0.8	20	
Vanadium	1.20	0.5	ug/L	1.19			0.8	20	
Zinc	8	5	ug/L	ND			NC	20	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	3.36	0.1	ug/L	ND	112	70-130			
Antimony	39.9	0.5	ug/L	ND	79.5	80-120			QS-02
Arsenic	49.5	1	ug/L	ND	98.0	80-120			
Barium	120	1	ug/L	76.1	87.3	80-120			
Beryllium	45.3	0.5	ug/L	ND	90.6	80-120			
Boron	66	10	ug/L	26	79.7	80-120			QS-02
Cadmium	42.3	0.1	ug/L	ND	84.5	80-120			
Chromium	47.6	1	ug/L	ND	94.7	80-120			
Cobalt	44.2	0.5	ug/L	ND	88.2	80-120			
Copper	47.7	0.5	ug/L	4.93	85.6	80-120			
Lead	43.2	0.1	ug/L	ND	86.3	80-120			
Molybdenum	45.2	0.5	ug/L	1.78	86.9	80-120			
Nickel	43.8	1	ug/L	ND	85.9	80-120			
Selenium	49.1	1	ug/L	ND	98.0	80-120			
Silver	42.9	0.1	ug/L	ND	85.8	80-120			
Sodium	33100	200	ug/L	25100	79.5	80-120			QS-02
Thallium	45.1	0.1	ug/L	ND	90.1	80-120			
Uranium	47.8	0.1	ug/L	0.7	94.2	80-120			
Vanadium	48.5	0.5	ug/L	1.19	94.7	80-120			
Zinc	45	5	ug/L	ND	82.9	80-120			

Certificate of Analysis

Report Date: 12-May-2020

Client: Paterson Group Consulting Engineers

Order Date: 6-May-2020

Client PO: 29915

Project Description: PE4321

Qualifier Notes:

QC Qualifiers :

QS-02 : Spike level outside of control limits. Analysis batch accepted based on other QC included in the batch.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

Paracel ID: 2019231

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Nº 126167

Client Name: PATERSON
Contact Name: KARYN MUNCH
Address: 154 Colonnade Road
Telephone: 617-226-7381

Project Ref: PE4321
Quote #:
PO #: 29915
E-mail: Kmunch@patersongroup.ca

Page 1 of 1

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required: _____

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☒ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	OC Pesticides
1	BH8-19-GW	GW		2	MAY 5/20					X	X			
2	~~BH16-19-GW~~	~~GW~~		~~3~~			~~X~~							
3	BH15-19-GW			1										X
4	BH16-19-GW			2						X	X			
5	BH18-19-GW			2										
6	BH19-19-GW			2										
7	BH20-19-GW	↓		2	↓					↓	↓			
8														
9														
10														

Required Analysis

Comments:

Method of Delivery: Paracel

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Joshua Dempsey	Date/Time:	Date/Time: May 6/20 2:46p	Date/Time: May 6/20 4:40p
Date/Time: MAY 5/2020	Temperature: °C	Temperature: 7.4 °C	pH Verified: ☐ By: N/A

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Subcontracted Analysis

Paterson Group Consulting Engineers
154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Tel: (613) 226-7381
Fax: (613) 226-6344

Paracel Report No.	**2019231**
Client Project(s):	**PE4321**
Client PO:	**29915**
Reference:	**Standing Offer**
CoC Number:	**126167**

Order Date:	06-May-20
Report Date:	19-May-20

Sample(s) from this project were subcontracted for the listed parameters. A copy of the subcontractor's report is attached

Paracel ID	Client ID	Analysis
2019231-02	BH15-19-GW	REG 153: Pesticides, OC,

TESTMARK Laboratories Ltd.
Committed to Quality and Service

CERTIFICATE OF ANALYSIS

Client:	Dale Robertson	Work Order Number:	399612
Company:	Paracel Laboratories Ltd.- Ottawa	PO #:	
Address:	300-2319 St. Laurent Blvd. Ottawa, ON, K1G 4J8	Regulation: Project #:	O.Reg 153 Table 3 Ground Water Stringent 2019231
Phone/Fax:	(613) 731-9577 / (613) 731-9064	DWS #:	
Email:	drobertson@paracellabs.com	Sampled By:	
Date Order Received:	5/8/2020	Analysis Started:	5/19/2020
Arrival Temperature:	9 °C	Analysis Completed:	5/19/2020

WORK ORDER SUMMARY

ANALYSES WERE PERFORMED ON THE FOLLOWING SAMPLES. THE RESULTS RELATE ONLY TO THE ITEMS TESTED.

Sample Description	Lab ID	Matrix	Type	Comments	Date Collected	Time Collected
BH15-19-GW	1535063	Water	None		5/5/2020	

METHODS AND INSTRUMENTATION

THE FOLLOWING METHODS WERE USED FOR YOUR SAMPLE(S):

Method	Lab	Description	Reference
OCPs Water (A19)	Garson	Determination of Organochlorine Pesticides in Water by GC/ECD	Modified from SW846-8081B

This report has been approved by:

Brad Halvorson, B.Sc.
Laboratory Director

7 Margaret Street, Garson, ON, P3L 1E1
Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399612

WORK ORDER RESULTS

Sample Description	BH15 - 19 - GW
Sample Date	5/5/2020 12:00 AM
Lab ID	1535063

OC Pesticides	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Ground Water Stringent
2,4'-DDD	<0.002	0.002	ug/L	~
2,4'-DDE	<0.01	0.01	ug/L	~
2,4'-DDT	<0.008	0.008	ug/L	~
4,4'-DDD	<0.005	0.005	ug/L	~
4,4'-DDE	<0.005	0.005	ug/L	~
4,4'-DDT	<0.008	0.008	ug/L	~
Aldrin	<0.006	0.006	ug/L	8.5
DDD (Total) (Calc.)	<0.006	0.006	ug/L	45
DDE (Total) (Calc.)	<0.008	0.008	ug/L	20
DDT (Total) (Calc.)	<0.01	0.01	ug/L	2.8
Decachlorobiphenyl (Surr.)	132	N/A	% Rec	~
Dieldrin	<0.004	0.004	ug/L	0.75
Endosulfan I	<0.005	0.005	ug/L	~
Endosulfan I + II (Calc.)	<0.009	0.009	ug/L	1.5
Endosulfan II	<0.004	0.004	ug/L	~
Endosulfan sulfate	<0.004	0.004	ug/L	~
Endrin	<0.006	0.006	ug/L	0.48
Endrin aldehyde	<0.008	0.008	ug/L	~
Heptachlor	<0.006	0.006	ug/L	2.5
Heptachlor epoxide	<0.007	0.007	ug/L	0.048
Hexachlorobenzene	<0.005	0.005	ug/L	3.1

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Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399612

Sample Description	BH15 - 19 - GW
Sample Date	5/5/2020 12:00 AM
Lab ID	1535063

OC Pesticides	Result	MDL	Units	Criteria: O.Reg 153 Table 3 Ground Water Stringent
Hexachlorobutadiene	<0.01	0.01	ug/L	0.44
Hexachloroethane	<0.009	0.009	ug/L	94
Methoxychlor	<0.02	0.02	ug/L	6.5
Mirex	0.009	0.006	ug/L	~
Oxychlordane	<0.009	0.009	ug/L	~
ß-BHC	<0.004	0.004	ug/L	~
α - Chlordane	<0.006	0.006	ug/L	~
α + γ -Chlordane (Calc.)	<0.007	0.007	ug/L	28
α-BHC	<0.006	0.006	ug/L	~
γ - Chlordane	<0.004	0.004	ug/L	~
γ-BHC (Lindane)	<0.005	0.005	ug/L	1.2
δ-BHC	<0.007	0.007	ug/L	~

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Phone: (705) 693-1121 Fax: (705) 693-1124 Web: www.testmark.ca

CERTIFICATE OF ANALYSIS

Paracel Laboratories Ltd.- Ottawa

Work Order Number: 399612

LEGEND

Dates: Dates are formatted as mm/dd/year throughout this report.

[rr]: After a parameter name indicates a re-run of that parameter. If multiple re-runs exist they are suffixed by a number. Sample may not have been handled according to the recommended temperature, hold time and head space requirements of the method after the initial analysis.

MDL: Method detection limit or minimum reporting limit.

~: In a criteria column indicates the criteria is not applicable for the parameter row.

Quality Control: All associated Quality Control data is available on request.

Exceedences: HIGHLIGHTED CELLS INDICATE THAT THE RESULT EXCEEDS A REGULATORY LIMIT. CALCULATED UNCERTAINTY ESTIMATIONS ARE NOT APPLIED FOR DETERMINING SAMPLE EXCEEDANCES.

Benzo(b)fluoranthene: Results for benzo(b)fluoranthene may include contributions from benzo(j)fluoranthene.

Field Data: Reports containing Field Parameters represent data that has been collected and provided by the client. Testmark is not responsible for the validity of this data which may be used in subsequent calculations.

Sample Condition Deviations: A noted sample condition deviation may affect the validity of the result. Results apply to the sample(s) as received.

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Certificate of Analysis

Paterson Group Consulting Engineers

154 Colonnade Road South
Nepean, ON K2E 7J5
Attn: Karyn Munch

Client PO: 31373
Project: PE4321
Custody: 55578, 55577, 55580, 55581

Report Date: 22-Dec-2020
Order Date: 16-Dec-2020

Order #: 2051346

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

Paracel ID	Client ID
2051346-01	HA35A-20
2051346-02	HA36A-20
2051346-03	HA36C-20
2051346-04	HA37A-20
2051346-05	HA38B-20
2051346-06	HA38C-20
2051346-07	HA39A-20
2051346-08	HA40B-20
2051346-09	HA40C-20
2051346-10	HA41A-20
2051346-11	HA42A-20
2051346-12	HA43A-20
2051346-13	HA43C-20
2051346-14	HA44A-20
2051346-15	HA44C-20
2051346-16	HA45A-20
2051346-17	HA46A-20
2051346-18	HA46B-20
2051346-19	HA46C-20
2051346-20	HA47A-20
2051346-21	HA48A-20
2051346-22	HA49A-20
2051346-23	HA50A-20
2051346-24	HA51A-20
2051346-25	HA51B-20
2051346-26	HA52A-20
2051346-27	HA53A-20
2051346-28	HA54A-20
2051346-29	HA55B-20
2051346-30	HA55C-20

Approved By:

Mark Foto

Mark Foto, M.Sc.
Lab Supervisor

2051346-31	HA56A-20
2051346-32	HA57B-20
2051346-33	HA58A-20

Certificate of Analysis

Report Date: 22-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 16-Dec-2020

Client PO: 31373

Project Description: PE4321

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Mercury by CVAA	EPA 7471B - CVAA, digestion	22-Dec-20	22-Dec-20
Solids, %	Gravimetric, calculation	17-Dec-20	17-Dec-20

Certificate of Analysis

Report Date: 22-Dec-2020

Client: **Paterson Group Consulting Engineers**

Order Date: 16-Dec-2020

Client PO: **31373**

Project Description: PE4321

	Client ID:	HA35A-20	HA36A-20	HA36C-20	HA37A-20
	Sample Date:	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00
	Sample ID:	2051346-01	2051346-02	2051346-03	2051346-04
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	79.5	84.6	86.6	82.0
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

	Client ID:	HA38B-20	HA38C-20	HA39A-20	HA40B-20
	Sample Date:	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	11-Dec-20 00:00
	Sample ID:	2051346-05	2051346-06	2051346-07	2051346-08
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	77.8	85.8	91.8	72.6
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

	Client ID:	HA40C-20	HA41A-20	HA42A-20	HA43A-20
	Sample Date:	11-Dec-20 00:00	11-Dec-20 00:00	11-Dec-20 00:00	11-Dec-20 00:00
	Sample ID:	2051346-09	2051346-10	2051346-11	2051346-12
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	65.1	77.1	81.7	77.4
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

	Client ID:	HA43C-20	HA44A-20	HA44C-20	HA45A-20
	Sample Date:	11-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00
	Sample ID:	2051346-13	2051346-14	2051346-15	2051346-16
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	78.6	85.6	80.0	78.3
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

	Client ID:	HA46A-20	HA46B-20	HA46C-20	HA47A-20
	Sample Date:	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	11-Dec-20 00:00
	Sample ID:	2051346-17	2051346-18	2051346-19	2051346-20
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	76.7	75.7	77.9	89.1
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	<0.1

Certificate of Analysis

Report Date: 22-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 16-Dec-2020

Client PO: 31373

Project Description: PE4321

	Client ID:	HA48A-20	HA49A-20	HA50A-20	HA51A-20
	Sample Date:	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	11-Dec-20 00:00
	Sample ID:	2051346-21	2051346-22	2051346-23	2051346-24
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	83.1	82.3	82.5	83.2
Metals					
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	0.1

	Client ID:	HA51B-20	HA52A-20	HA53A-20	HA54A-20
	Sample Date:	11-Dec-20 00:00	11-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00
	Sample ID:	2051346-25	2051346-26	2051346-27	2051346-28
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	76.0	75.6	82.0	80.2
Metals					
Mercury	0.1 ug/g dry	0.1	<0.1	0.1	<0.1

	Client ID:	HA55B-20	HA55C-20	HA56A-20	HA57B-20
	Sample Date:	09-Dec-20 00:00	09-Dec-20 00:00	09-Dec-20 00:00	11-Dec-20 00:00
	Sample ID:	2051346-29	2051346-30	2051346-31	2051346-32
	MDL/Units	Soil	Soil	Soil	Soil
Physical Characteristics					
% Solids	0.1 % by Wt.	85.8	80.7	79.3	77.3
Metals					
Mercury	0.1 ug/g dry	<0.1	0.1	<0.1	<0.1

	Client ID:	HA58A-20	-	-	-
	Sample Date:	11-Dec-20 00:00	-	-	-
	Sample ID:	2051346-33	-	-	-
	MDL/Units	Soil	-	-	-
Physical Characteristics					
% Solids	0.1 % by Wt.	79.8	-	-	-
Metals					
Mercury	0.1 ug/g dry	0.2	-	-	-

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g						

Certificate of Analysis

Report Date: 22-Dec-2020

Client: Paterson Group Consulting Engineers

Order Date: 16-Dec-2020

Client PO: 31373

Project Description: PE4321

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Physical Characteristics									
% Solids	83.0	0.1	% by Wt.	80.7			2.8	25	

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Mercury	1.47	0.1	ug/g	ND	98.0	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

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

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

PARACEL LABORATORIES

Paracel ID: 2051346

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2051346	№ 55578

Client Name: Paterson Group Inc.	Project Ref: PE4321	Page 1 of 4
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 154 Colonnade Road S.	PO #: 31373	☐ 1 day ☐ 3 day
	E-mail: kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: Mercury
1	HA35A-20	S		1	Dec 9/20		✓
2	HA36A-20						✓
3	HA36C-20						✓
4	HA37A-20						✓
5	HA38B-20						✓
6	HA38C-20						✓
7	HA39A-20						✓
8	HA40B-20				Dec. 11/20		✓
9	HA40C-20						✓
10	HA41A-20						✓

Comments:

Method of Delivery: Drop Box

Relinquished By (Sign): KMunch	Received By Driver/Depot:	Received at Lab: Jumeepreet Dhiman	Verified By:
Relinquished By (Print): KMunch	Date/Time:	Date/Time: Dec 16, 2020 02.45	Date/Time: Dec 16/20 3:50p
Date/Time: Dec.16/20	Temperature: °C	Temperature: 13.9 °C	pH Verified: ☐ By: N/A

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Paracel ID: 2051346

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2051346	Nº 55577

Client Name: Paterson Group Inc.	Project Ref: PE4321	Page 2 of 4
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 154 Colonnade Rd S.	PO #: 31373	☐ 1 day ☐ 3 day
	E-mail: kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☑ Table 3 & 7 RSC comments	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analysis: Mercury
1	HA42A-20	S		1	Dec.11/20		✓
2	HA43A-20						✓
3	HA43C-20						✓
4	HA44A-20				Dec.9/20		✓
5	HA44C-20						✓
6	HA45A-20						✓
7	HA46A-20						✓
8	HA46B-20						✓
9	HA46C-20						✓
10	HA47A-20				Dec.11/20		✓

Comments: Samples HA42A → HA46A & HA52A (page 3) Table 7
remaining Samples Table 3.

Method of Delivery:

Relinquished By (Sign): KMunch	Received By Driver/Depot:	Received at Lab: Shreeparan Dhiman	Verified By:
Relinquished By (Print): KMunch	Date/Time:	Date/Time: Dec 16, 2020 02.45	Date/Time: Dec 16/20 3:50p
Date/Time: Dec.16/20	Temperature: °C	Temperature: 13.9 °C	pH Verified: ☐ By: N/A

PARACEL LABORATORIES LTD

Paracel ID: 2051346

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2051346	Nº 55580

Client Name: Paterson Group Inc.	Project Ref: PE4321	Page 3 of 4
Contact Name: Karyn Munch	Quote #:	Turnaround Time
Address: 154 Colonnade Rd. S.	PO #: 31373	☐ 1 day ☐ 3 day
	E-mail: kmunch@patersongroup.ca	☐ 2 day ☒ Regular
Telephone: 613-226-7381		Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun:
For RSC: ☐ Yes ☐ No	☐ Other:

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

Required Analysis

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	moisture											
1	HA48A-20	S			Dec 9/20		✓											
2	HA49A-20	S			↓		✓											
3	HA50A-20	S			↓		✓											
4	HA51A-20	S			Dec. 11/20		✓											
5	HA51B-20	S			↓		✓											
6	HA52A-20	S			↓		✓											
7	HA53A-20	S			Dec. 9/20		✓											
8	HA54A-20	S			↓		✓											
9	~~HA55A-20~~																	
10	HA55B-20	S			↓		✓											

Comments:

Method of Delivery:

Relinquished By (Sign): KMunch	Received By Driver/Depot:	Received at Lab: Dhruv Dhmai	Verified By: [signature]
Relinquished By (Print): K.Munch	Date/Time:	Date/Time: Dec 16, 2020 02.45	Date/Time: Dec 16/20 3:50p
Date/Time: Dec.16/20	Temperature: °C	Temperature: 13.9°C	pH Verified: ☐ By: N/A

PARA LABORATORI

Paracel ID: 2051346

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Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2051346	Nº 55581

Client Name: Paterson Group Inc.
Contact Name: Kaylyn Munch
Address: 154 Colonnade Rd. S.
Telephone: 613-226-7381

Project Ref: PE4321
Quote #:
PO #: 31373
E-mail: kmunch@patersongroup.ca

Page 4 of 4

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☒ Regular
Date Required:

Regulation 153/04	Other Regulation
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☐ PWQO
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ CCME ☐ MISA
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm
☐ Table ___	Mun: ___
For RSC: ☐ Yes ☐ No	☐ Other:

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

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: VOCs + MTBE
1	HA55C-20				Dec. 9/20		✓
2	HA56A-20				"		✓
3	HA57B-20				Dec. 11/20		✓
4	HA58A-20				"		✓
5							
6							
7							
8							
9							
10							

Comments:

Method of Delivery:

Relinquished By (Sign): KMunch	Received By Driver/Depot:	Received at Lab: Dwayne Dolmage	Verified By:
Relinquished By (Print): KMunch	Date/Time:	Date/Time: Dec 16, 2020 02.45	Date/Time: Dec 16/20 3:50p
Date/Time: Dec. 16/20	Temperature: °C	Temperature: 13.9°C	pH Verified: ☐ By: N/A