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A REPORT TO

BARA GROUP (RIVER OAK) INC.

PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

PROPOSED MIXED-USE DEVELOPMENT

2163 AND 2169 SIXTH LINE

TOWN OF OAKVILLE

Reference No. 1908-E077

November 29, 2019

DISTRIBUTION

3 Copies - Bara Group (River Oak) Inc.

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It should be noted that the information supplied in this report is not sufficient to obtain approval for disposal of excess soil or materials generated during construction.

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1.0 EXECUTIVE SUMMARY

Soil Engineers Ltd. (SEL) was retained by to conduct a Phase Two Environmental Site Assessment (Phase Two ESA), as defined by Ontario Regulation (O. Reg.) 153/04, as amended. The Phase Two Property is located at 2163 and 2169 Sixth Line, in the Town of Oakville (hereinafter referred to as "subject site").

The purpose of the Phase Two ESA was to determine the soil and groundwater quality at the subject site, as related to the environmental concerns identified in our Phase One Environmental Site Assessment (Phase One ESA) for the subject site.

Soil and groundwater samples collected and submitted for chemical analysis were compared with the Ministry of the Environment, Conservation and Parks (MECP) Table 2, Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/ Parkland/Institutional Property Use and coarse textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011 (Table 2 Standards).

A review of the analytical results of the soil and groundwater samples indicates the tested parameters at the test locations meet the Table 2 Standards. Consequently, there are no contaminants identified at the subject site at a concentration above the applicable site condition standards (Table 2 Standards) during the Phase Two ESA.

Based on the findings of the Phase Two ESA, it is our opinion that the property is suitable for the proposed development. No further environmental investigation is recommended at this time.

2.0 INTRODUCTION

Soil Engineers Ltd. (SEL) was retained by to carry out a Phase Two Environmental Site Assessment (Phase Two ESA), as defined by Ontario Regulation (O. Reg.) 153/04, as amended by O. Regs. 366/05, 66/08, 511/09, 245/10, 179/11, 269/11 and 333/13, herein referred to as O. Reg. 153/04. The Phase Two property is located at 2163 and 2169 Sixth Line, in the Town of Oakville (hereinafter referred to as "subject site").

The purpose of the Phase Two ESA is to determine the soil and groundwater quality at the subject site, as related to the environmental concerns identified in our Phase One Environmental Site Assessment (Phase One ESA).

2.1 Site Description

The subject site, irregular in shape and approximately 0.71 ha (1.76 ac) in area, is located west side of River Oak Boulevard East and north of Sixth Line The municipal address of the subject site is 2163 and 2169 Sixth Line. The location of the subject site is shown on the Drawing No. 1. The Property Identification Numbers (PINs) and the property descriptions from the parcel registers, associated with the subject site are listed in the table below:

PIN from Parcel Register	Property Description from Parcel Register
24912-0149 (LT)	PCL 16-61, SEC T14 ; PT LT 16, CON 1 TRAFALGAR, SOUTH OF DUNDAS STREET , PARTS 5 & 8 , 20R7391 ; T/W PT LT 16, CON 1 TSDS, PT 1,2, 20R7391, AS IN H305801 ; S/T H305802 ; T/W PT LT 16, CON 1 TSDS, PT 1, 20R7391, AS IN H305802 ; T/W PT LT 16, CON 1 TSDS, PT 4 20R7391, AS IN H305801 ; OAKVILLE
24912-0284 (LT)	PCL 16-63, SEC T-14; PT LT 16, CON1 TRAF SDS, PT 1 20R6377 EXCEPT PT OF PT 1 LYING WITHIN THE LIMITS OF PT 2 20R6739; OAKVILLE.
24912-0148 (LT)	PCL 16-62. SEC T14; PT 16, CON 1 TRAF SDS, PT 2 20R6377 EXCEPT PT 3, 20R6739; OAKVILLE

At the time of Phase One ESA inspection, the subject site is mainly comprised of four (4) commercial buildings and one (1) garbage shed. The remaining property is used for parking with some landscaping.

The neighbouring properties consist mainly of the Nipegon trail to the north/northeast and residential properties in all remaining directions.

2.2 Property Ownership

This Phase Two ESA was commissioned to address the environmental concerns identified in our Phase One ESA and in accordance with our proposal dated August 28, 2019, as approved by Mr. Arash Barati of Bara Group (River Oak) Inc.

Our client and the current owner of the subject site can be contacted at:

58 Cotswold Crescent
Toronto, Ontario
M2P 1N2

Attention: Mr. Arash Barati

2.3 Current and Proposed Future Uses

The subject site has been used for commercial purposes since 1989. A mixed-use development is being proposed for the subject site. It is anticipated that the new development will be provided with municipal services meeting urban standards.

2.4 Applicable Site Condition Standard

SEL has selected the applicable regulatory criteria from Ontario Regulation 153/04, as amended, made under the Environmental Protection Act, June 1, 2004, to assess the analytical data from the submitted soil and groundwater samples. The following information was used to select the appropriate criteria:

- The subject site is not considered to be sensitive based on the definition set forth in Ontario Regulation 153/04 as amended, as the property is not within/adjacent/part of an area of natural significance and the analytical testing indicated the pH of the tested surface soil samples is between 5 and 9 and subsurface soil sample is between 5 and 11.

- The property is a shallow soil property, as the bedrock was encountered within 2.0 m below ground surface (mbgs) during the investigation.
- No waterbody is located at the subject site or within 30 m from the site's boundary.
- Generic site condition criteria is to be used in this assessment.
- The intended property use of the subject site is mixed-use, therefore, residential use standard applied.
- Based on the information obtained from the Phase One ESA, no water well is recorded for the subject site and neighbouring properties.
- No grain size analysis has been performed as part of the Phase Two ESA, therefore, coarse textured soil (more stringent) standards are applied.

Based on the above considerations, the Ministry of the Environment, Conservation and Parks (MECP) Table 2, Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Residential/ Parkland/Institutional Property Use and coarse textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011, has been selected for evaluating the environmental conditions at the subject site.

3.0 BACKGROUND

3.1 Physical Setting

Based on the information obtained from our Phase One ESA, the general physical setting of the subject site is summarized below:

The subject site is located within a residential and commercial area in the Town of Oakville. The neighbouring properties consist mainly of the Nipegon trail to the north/northeast and residential properties in all remaining directions.

A review of a Geological Map of the area, located at the Ontario Geological Survey indicates the subject site is underlain on Halton Till Material, which is predominantly silt to silty clay matrix, high in matrix carbonate content and clast poor. Bedrock in the area of the subject site consists of Queenston Formation, and the rock description is limestone, dolostone, shale, and siltstone.

According to the Bedrock Cross Section Viewer, the depth of bedrock in the general vicinity of the subject site is approximately 6 mbgs.

The overall grade of the subject site generally descends towards the southeast. A watershed map provided by Land Information Ontario (LIO) Watershed shows the subject site is located within the Sixteen Mile Creek Watershed.

Based on the review of the Ontario Ministry of Natural Resources and Forestry Natural Heritage Information Centre for listings of the various classes of natural areas located within the vicinity of the subject site, there is no Areas of Natural Significance or waterbody located at the subject site or neighbouring properties within 30 m of the subject site boundary.

3.2 Past Investigations

The following previous investigation reports prepared by SEL for the subject site was reviewed as part of this Phase Two ESA:

- Phase One Environmental Site Assessment, Reference No. 1908-E077, dated September 13, 2019.

Summery of Phase One ESA

The Phase One ESA identified the Potentially Contaminating Activity (PCA) at the subject site that may contribute to an Area of Potential Environmental Concern (APEC) at the subject site, based on records review, interviews and site reconnaissance. The findings of the Phase One ESA include the following APECs:

- River Oaks Photo with photo processing records was reported at the subject site in the past.
- Northwestern portion of plaza was burnt in the past.

During Phase two Investigation, additional one (1) PCA (unknown quality of fill material underneath the subject site building) was identified at the subject site. This PCA was also investigated in the Phase Two ESA investigation.

PCAs and APECs identified in the above mentioned report are presented on Drawing No. 2. The sampling and analysis plan for our Phase Two ESA was prepared and executed based on findings of Phase One ESA and additional PCA identified during Phase two ESA, included in Appendix 'A'.

4.0 SCOPE OF INVESTIGATION

4.1 Overview of Site Investigation

The purpose of this investigation (Phase Two ESA) is to assess the soil and groundwater quality at the subject site, as related to the environmental concern raised in the findings of our Phase One ESA. This Phase Two ESA was conducted in general conformance with the CSA Standard Z769-00 and O. Reg. 153/04 as amended.

The scope of work for this investigation includes:

- Conduct ten (10) boreholes to the depths ranging from 1.5 meter below existing ground surface (mbgs) to 9.1 mbgs during combined environmental, geotechnical and hydrogeological investigation.
- Collect representative soil samples from the selected boreholes.
- Undertake field examination of the retrieved soil samples for visual and olfactory evidence of potential contamination.
- Undertake soil vapour measurements for the retrieved soil samples using a combustible gas detector (RKI Eagle) in methane elimination mode, calibrated with hexane and having a minimum detection level of 2 ppm (parts per million by volume).
- Install a monitoring well in selected boreholes for groundwater sampling testing and monitoring.
- Conduct groundwater monitoring and collect groundwater samples for chemical testing.
- Carry out analytical testing program on selected soil and groundwater samples including quality assurance/quality control (QA/QC samples) for one or more of the following parameters: petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polyciclyc aromatic hydrocarbons (PAHs), pH and metals and/or inorganics.
- Review the analytical results for the submitted soil and groundwater samples using the applicable Site Condition Standards.
- Prepare a Phase Two ESA report presenting the findings of the investigation.

The rationale behind the selection of sample locations is presented in the Sampling and Analysis Plan, Appendix 'A'.

4.2 Media Investigated

Based on the findings of the Phase One ESA, soil and groundwater media was investigated during the Phase Two ESA in accordance with the Sampling and Analysis Plan provided in Appendix 'A'. No sediment sampling was conducted, as there is no surface water at the subject site.

Boreholes were advanced using a track mount drill rig (Geoprobe 420M) equipped with flight augers, supplied by Kodiak Drilling and a truck mount rig (CME 75), supplied by DBW Drilling Ltd. Soil samples from the boreholes were recovered at regular intervals, using dual tubes and split spoon sampling equipment.

Soil samples were logged in the field and head space vapour screening was conducted for the retrieved soil samples using a combustible gas detector (RKI Eagle) in methane elimination mode, calibrated with hexane and having a minimum detection level of 2 ppm (parts per million by volume).

Groundwater monitoring wells were installed in the selected boreholes. The monitoring wells were constructed using 50 mm diameter flush-joint threaded PVC monitoring well supplies. They were completed with 3.0 m in length intake screen. Groundwater sampling was conducted using dedicated low-density polyethylene tubing and laboratory-supplied containers (prepared with preservative for the analysis being conducted).

4.3 Phase One Conceptual Site Model

A plan, illustrating the features of the subject site and surrounding areas within 250 m from the subject site boundaries including the locations of the PCA, is presented in Drawing No. 1.

4.4 Deviations From Sampling and Analysis Plan

No deviations from the sampling and analysis plan were encountered.

4.5 Impediments

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

5.0 INVESTIGATION METHOD

5.1 General

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plans provided in Appendix 'A' and in accordance with the SEL Standard Operating Procedures.

The Phase Two ESA was conducted inconjuction with the geotechnical and hydrological investigations at the subject site. The investigations consisted of drilling ten (10) boreholes and installation of monitoring wells at the selected borehole locations, field measurements and collection of soil and groundwater samples from the boreholes and monitoring wells for chemical analysis. The soil and groundwater samples were assessed for the potential contamination with respect to the APEC identified by the Phase One ESA.

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

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

5.2 Drilling and Excavating

Prior to the field work, the underground utilities were located and marked out in the field by representatives of the major utility companies and the private locator, Weir Environmental.

The field works of the investigation were conducted on October 3, 4, 7, 9 and 10, 2019, and consisted of drilling ten (10) boreholes (designated as BH1 to BH10) to the depths ranging from 1.5 mbgs to 9.1 mbgs. Five (5) monitoring wells (MW1, MW 2, MW4, MW7 and MW8) were installed to the depths ranging from 6.1 mbgs to 9.1 mbgs to collect groundwater samples. The sample locations are shown on Drawing No. 2.

Boreholes were advanced using a track mount drill rig equipped with flight augers, supplied by Geoprobe 420 M supplied by Kodiak Drilling and a truck mount rig, supplied by DBW Drilling Ltd. Soil samples from the boreholes were recovered at regular intervals and using split spoon and dual tubes sampling equipment, for soil vapour measurement, soil classification and visual and olfactory observations.

The field work was supervised by a SEL. environmental technician who recorded the findings and observations.

5.3 Soil Sampling

Soil samples from the boreholes were recovered at regular intervals and using split spoon and dual tubes sampling equipment. Prior to recovering a sample, the sampling equipment was brushed clean using a solution of phosphate-free detergent and distilled water, and each discrete sample was handled with new disposable gloves in order to avoid the risk of cross-contamination between the samples. In addition, any sub-sampling equipment is decontaminated prior to each usage.

Each soil sample was split with part of the sample sealed in a laboratory-prepared glass jar and stored in a cooler with ice, and the remainder of the sample sealed in a double sealable bag for vapour measurement and soil classification.

The subsoil condition at the borehole locations indicate a layer of asphalt/concrete and fill material including granular, sand and sandy silt or topsoil at the ground surface, followed by silty clay till and weathered shale. The subject site is underlain by silty clay till and weathered shale at various depths and locations. Weathered shale was encountered below 2.0 mbgs during the Phase Two ESA. Detailed descriptions of the encountered subsurface conditions are present on the Borehole Logs provided in Appendix 'B'.

Based on the soil vapour measurements and/or visual and olfactory observations, representative worst case soil samples from the sampling locations were submitted to the laboratory for chemical analyses.

5.4 Field Screening Measurements

The headspace vapour concentrations were measured using a portable RKI Eagle gas detector, TYPE 101 (Serial Number: E091011) set to include organic gases with the exception of methane (methane elimination mode), and having a minimum detection level of 0.1 ppm (parts per million by volume). Our technician was trained by the supplier for the proper calibration procedure. The instrument is calibrated or tuned up by the supplier (Pine Environmental Service Inc.) seasonally.

The result of the soil vapour measurement is presented in Borehole Log, Appendix 'B'. The representative worst case soil samples based on the soil vapour measurements and/or visual and olfactory observations were selected from boreholes, and submitted to the laboratory for chemical analyses.

5.5 Groundwater: Monitoring Well Installation

Total of five (5) monitoring wells were installed at the subject site by DBW Drilling Ltd during combined environmental, geotechnical and hydrogeological investigation. The monitoring wells were constructed using 50 mm diameter PVC screen, and 3.0 m in length. A PVC riser, capped at the top, was installed from the screen section above the top grade. A sand pack, consisting of clean silica sand, was placed around the screened zone with a bentonite seal placed above the sand pack. The top of each well was sealed with concrete to approximately 0.3 mbgs. At each monitoring well location, the risers were protected by flush mount casings that have been sealed into ground with concrete. The monitoring well construction details are provided on the Borehole Logs in Appendix 'B' and in Table I.

The monitoring wells were instrumented with dedicated low-density polyethylene tubing to facilitate well development, purging and sampling requirements.

Groundwater development was performed on October 14, 2019. The monitoring wells have been developed to remove any fluids that may have been introduced into the wells during drilling; and to remove particles that may have become entrained into the wells and filter packs (three well casing volumes of groundwater in each well). Purged water was contained and stored at the subject site for future disposal.

5.6 Groundwater: Field Measurement of Water Quality Parameters

Groundwater monitoring and purging were conducted at the subject site on October 14, 2019. Water level measurements data and water temperature were taken using a water level meter (Dipper-T) equipped with a thermometer. Groundwater observations were recorded for colour, clarity, the presence or absence of any free petroleum product/surface sheen and any odours present during purging the wells. The water level measuring device was cleaned after each measurement using Alconox solution and water, followed by a distilled water rinse and a methanol rinse, in order to prevent cross-contamination between monitoring wells.

The records of water level measurement and temperature are presented in Table II.

5.7 Groundwater Sampling

Groundwater sampling was conducted on October 23, 2019. Prior to groundwater sampling, minimum 3 well casing volumes of groundwater from each well was purged to ensure that stagnant water is removed from monitoring wells. Purge water was contained and stored on site for future disposal. The groundwater purging and sampling activities were carried out using dedicated low-density polyethylene tubing. Groundwater sample was collected into laboratory-supplied containers, prepared with preservative for the analyses being conducted.

5.8 Sediment Sampling

Sediment was not assessed as part of this investigation.

5.9 Analytical Testing

The soil and groundwater samples were analysed by Maxxam Bureau Veritas Laboratories in Mississauga, Ontario. Bureau Vertias Laboratories are accredited by the Canadian Association for Laboratory Accreditation acordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for all the parameters analyzed during this investigation.

5.10 Residue Management Procedures

Excess soil generated from the drilling program for the site investigation was stored at the subject site in metal barrels. Groundwater purged from the monitoring well was stored in containers, using a separate container for each well. The metal barrels and containers are clearly marked and stored temporarily on the subject site for subsequent disposal.

5.11 Elevation Surveying

The ground elevation at each of the borehole locations was surveyed using a grade laser surveying equipment. The equipment is capable of having vertical and horizontal accuracy of ±0.1 m.

The elevations at the borehole and monitoring well locations are presented in the Table II and borehole/monitoring well logs provided in Appendix 'B'.

5.12 Quality Assurance and Quality Control Measures

The soil and groundwater sampling and analysis plan provided in Appendix 'A' was prepared and executed using based on the findings of our Phase One ESA.

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan and in accordance with the SEL Standard Operating Procedures.

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

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

Field observations were made and documented in a field book in accordance with generally accepted practices and with the procedures developed and utilized by SEL.

SEL field sampling QA/QC protocols applied to the investigation are summarized as follows:

- The collection of at least one field duplicate sample per site for every sampling media (where three or more such samples are collected).

- Where volatile organic chemical analysis is required, the collection of discrete samples directly into laboratory-prepared sample vials and immediate placement into a cooler with ice to maintain the temperature at less than 10 °C for transport to the laboratory.

- The use of dedicated equipment (bailers, Waterra tubing, etc.) for groundwater sampling at different monitors and the thorough cleaning of soil sampling equipment between sample sites.

- If trace organics in the collected samples are anticipated (organic chemicals with a concentration of less than 1 μg/g), precautions are made to avoid any possible cross-contamination (eliminating bare hand or latex glove contacts with the soil or water; soil sampling equipment used for the collection of trace organics are cleaned using a phosphate-free detergent and water, followed by a distilled water rinse and a methanol rinse between sampling sites.

- The inclusion of one trip blank for water samples per site (where three or more samples are collected) for VOC parameters; the bottles containing the trip blank are prepared by the laboratory; QA/QC samples are kept in the cooler on ice for the duration of the sampling event, and returned to the laboratory for analyses.

The results of the field duplicate sample are discussed later in Section 6.9 of this report.

6.0 REVIEW AND EVALUATION

6.1 Geology

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs provided in Appendix 'B'. The subsoil condition at the borehole locations indicate a layer of asphalt/concrete and fill material including granular, sand and sandy silt or topsoil at the ground surface, followed by silty clay till and weathered shale. The subject site is underlain by silty clay till and weathered shale at various depths and locations. Weathered shale was encountered below 2.0 mbgs during the Phase Two ESA.

The descriptions of the strata, encountered at the borehole locations, are briefly discussed below.

Ashpalt/Concrete and Granular Fill

An asphalt/concrete layer was encountered at all borehole locations, excluding BH3 and BH6, at the ground surface . The ashpalt layer extends to depths of 0.8 mbgs to 0.13 mbgs. Granular fill was encountered below ashplat layer and extends to depths from 0.2 mbgs to 0.33 mbgs.

Sand Fill

A sand fill layer was encountered at BH9, below the concrete layer . The sand fill layer extends to a depth of 0.9 mbgs.

Sandy Silt Fill

A sandy silt fill layer was encountered at BH10, below the concrete layer . The sandy silt fill layer extends to a depth of 0.9 mbgs.

Topsoil

A topsoil layer was encountered in BH3 and BH9 at the ground surface. It extends to dephs 0.8 mbgs to 0.13 mbgs.

Silty Clay Till

A silty clay till deposit was encountered at borehole locations, below the fill material and topsoil. The silty clay till deposit extends to depths from 1.5 mbgs to 3.2 mbgs.

Weathered Shale

Weathered shale was encountered at borehole locations below the silty clay till deposit. The weathered shale depths extends from 6.1 mbgs to 9.4 mbgs.

Hydrogeology

On completion of drilling activities on October 10, 2019, monitoring wells were dry. Based on the field observation and groundwater monitoring records (as indicated in the section below), shallow groundwater is present in weathered shale.

6.2 Groundwater: Elevations and Flow Direction

Five (5) monitoring wells were installed at the subject site during combined geological, hydrological and environmental investigations, on October 3, 4, 9 and 10, 2019. The monitoring wells were installed at various depths, within the weathered shale. Groundwater records were documented during the drilling of boreholes and during the groundwater sampling rounds on the dates indicated above in section 5.5 and 5.6.

On Occtober 10, 2019 water levels were recorded at depths of 5.2 mbgs, 5.1 mbgs, 5.2 mbgs, 5.3 mbgs, and 5.7 mbgs in the monitoring wells MW1, MW2, MW4, MW7 and MW8, respectively. The corresponding water table elevations are 143.4 masl, 143.5 masl, 142.27 masl, 141.7 masl and 141.2 mals, respectively.

The ground elevations of the monitoring wells were surveyed using a grade laser surveying equipment. Water level measurements and water temperature were taken using a water level meter (Dipper-T). Top surface of each well casing was used as a reference point to determine the groundwater table. The measurements were reduced to static elevations based on the

monitoring well survey data. Shallow groundwater levels, recorded on October 10, 2019 were used to determine the flow direction. Based on the groundwater monitoring records, the groundwater flow direction appears towards east to southeast. No free product or surface sheen was observed in any of the monitoring wells.

The groundwater elevations measured in the monitoring wells are summarized in Table II. The shallow groundwater contours and interpreted ground water flow direction are shown on Drawing No. 5.

6.3 Groundwater: Hydraulic Gradients

Based on the groundwater records of October 10, 2019, the horizontal hydraulic gradient for the investigated aquifer within weathered shale at the subject site ranges from 0.001 m/m to 0.02 m/m (average 0.01 m/m).

6.4 Fine-Medium Soil Texture

No grain size analysis was performed as part of this investigation. Therefore, site condition standards for coarse textured soils were used in the assessment.

6.5 Soil: Field Screening

Head space vapour screening was conducted for all retrieved soil samples using an organic gas detector (RKI Eagle) in methane elimination mode, calibrated with hexane and having a minimum detection level of 0.1 ppm.

Soil vapour was non detected in the soil samples retrieved from the sampling locations.

6.6 Soil Quality

Representative "worst case" soil sample from the boreholes were selected based on the soil vapour measurements and visual and olfactory observations. The selected soil samples were submitted to the laboratory for chemical analyses of VOCs, PHCs, PAHs, pH and metals.

The soil test results were reviewed using the Table 2, Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/ Parkland/Institutional Property Use and coarse textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011 (Table 2 Standards).

Soil quality data containing results of the chemical analyses for the tested soil samples is presented in Table III. Maximum concentrations of the tested parameters in soil are presented in Table IV.

The Certificates of Analyses for the soil samples are presented in Appendix 'C'. The findings of the soil test results are summarized below:

Metals

Two (2) original soil samples and one (1) duplicate sample were submitted for analysis of metals parameters. The test results indicate the soil samples meet the Table 2 Standards.

Petroleum Hydrocarbons (PHCs)

Two (2) original soil samples were submitted for analyses of PHCs. The test results indicate PHC concentrations in the tested soil samples meet the Table 2 Standards.

Volatile Organic Compounds (VOCs)

Two (2) original soil samples were submitted for analyses of VOCs. The test results indicate VOC concentrations in the tested soil samples meet the Table 2 Standards.

Polyciclic Aromatic Hydrocarbons (PAHs)

Two (2) original soil samples were submitted for analyses of PAHs. The test results indicate PAH concentrations in the tested soil samples meet the Table 2 Standards.

6.7 Groundwater Quality

During the investigation, groundwater sampling and testing program was conducted at the subject site for analyses of PHCs, PAHs, VOCs, and metals.

The groundwater test results were reviewed using the Table 2, Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/ Parkland/ Institutional Property Use and coarse textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011 (Table 2 Standards).

Groundwater quality data containing results of chemical analyses for the tested groundwater samples are presented in Table IV. Maximum concentrations of the tested parameters in the groundwater are presented in Table VI.

A copy of the Certificate of Analyses for the groundwater samples is presented in Appendix 'D'.

The findings of the groundwater test results are summarized below:

Metals

One (1) groundwater sample was submitted for analyses of metals. The test results indicate the concentrations of metals and inorganics in the tested groundwater samples meet the Table 2 Standards.

Petroleum Hydrocarbons (PHCs)

One (1) original groundwater sample was submitted for analysis of PHCs and one (1) duplicate sample was submitted for anlaysis of benzene, toluene, ethylbenzene, xylene (BTEX) and PHC F1. The test results indicate PHC, BTEX concentrations in the tested groundwater samples meet the Table 2 Standards.

Polyciclyc Aromatic Hydrocarbons (PAHs)

One (1) original groundwater sample was submitted for analysis of PAHs. The test results indicate that the PAHs concentrations in the tested groundwater samples and the trip blank sample meet the Table 2 Standards.

Volatile Organic Compounds (VOCs)

One (1) original groundwater sample was submitted for analyses of VOCs. The test results indicate VOC concentrations in the tested groundwater sample meets the Table 2 Standards.

6.8 Sediment Quality

Sediment was not assessed as part of this investigation.

6.9 Quality Assurance and Quality Control Results

The Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan and in accordance with the SEL Standard Operating Procedures.

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

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

6.9.1 Field Quality Assurance/Quality Control Samples

As part of the QA/QC program for the Phase Two ESA, QC samples in the form of field duplicate and trip blank samples were analysed. Field duplicate samples were collected in the field for metals in soil, and for BTEX in groundwater. One (1) trip blank for BTEX was shipped with each batch of the groundwater samples submitted for analysis.

Field Duplicate

A total of one (1) field duplicate soil sample and one (1) field duplicate groundwater sample were collected and submitted for chemical analysis. Details of duplicate sampling and analysis are presented in the table below:

Duplicate Sample ID	Original Sample ID	Media	Test Conducted
DUP1	BH10/1	Soil	Metals
DUPMW	MW4	Groundwater	BTEX and PHC F1

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

Trip Blank

One trip blank sample was submitted to the laboratory for analyses of BTEX. The trip blank sample was found to be below the laboratory reported detection limits (RDLs). There was no issue with the trip blank that was shipped with the batch of the groundwater samples submitted for analysis.

6.9.2 Sample Handling in Accordance with the Analytical Protocol

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

6.9.3 **Certification of Results**

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

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

Copies of all Certificates of Analysis are included in Appendix 'C' and 'D'.

6.9.4 **Data Validation**

The Analytical Protocol establishes Acceptance Limits for use when assessing the reliability of data reported by analytical laboratories including maximum holding times for the storage of samples/sample extracts between collection and analysis, analytical methods, field and/or laboratory quality assurance samples, recovery ranges for spiked samples and surrogates, RDLs, mandatory maximum method detection limits) and precision required when analyzing laboratory replicate and spiked samples.

The review of the data in the Certificate of Analysis indicates:

- All samples/sample extracts were analyzed within their applicable holding times using approved analytical methods.
- No tested parameters were detected in any laboratory blank samples.
- The RDLs were met for all tested parameters.
- The result of the laboratory duplicate samples is similar to the results for the original sample and relative percent differences for the detectable tested parameters are within the acceptable range.

6.9.5 **Data Quality Objectives**

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

6.10 **Phase Two Conceptual Site Model**

The Phase Two Conceptual Site Model is prepared based on the findings of the Phase One Environmental Site Assessment (Phase One ESA) and this Phase Two Environmental Site Assessment (Phase Two ESA).

6.10.1 **Description and Assessment**

The subject site, irregular in shape and approximately 0.71 ha (1.76 ac) in area, is located west side of River Oak Boulevard East and north of Sixth Line The municipal address of the subject site is 2163 and 2169 Sixth Line. The location of the subject site is shown on the Drawing No. 1. The Property Identification Numbers (PINs) , the property descriptions from the parcel registers and the UTM coordinates obtained from Google Earth database, associated with the subject site are listed in the table below:

PIN from Parcel Register	Property Description from Parcel Register
24912-0149 (LT)	PCL 16-61, SEC T14 ; PT LT 16, CON 1 TRAFALGAR, SOUTH OF DUNDAS STREET , PARTS 5 & 8 , 20R7391 ; T/W PT LT 16, CON 1 TSDS, PT 1,2, 20R7391, AS IN H305801 ; S/T H305802 ; T/W PT LT 16, CON 1 TSDS, PT 1, 20R7391, AS IN H305802 ; T/W PT LT 16, CON 1 TSDS, PT 4 20R7391, AS IN H305801 ; OAKVILLE
24912-0284 (LT)	PCL 16-63, SEC T-14; PT LT 16, CON1 TRAF SDS, PT 1 20R6377 EXCEPT PT OF PT 1 LYING WITHIN THE LIMITS OF PT 2 20R6739; OAKVILLE.
24912-0148 (LT)	PCL 16-62. SEC T14; PT 16, CON 1 TRAF SDS, PT 2 20R6377 EXCEPT PT 3, 20R6739; OAKVILLE

At the time of inspection, the subject site is mainly comprised of four (4) commercial buildings and one (1) garbage shed. The remaining property is used for parking with some landscaping.

6.10.1.1 Areas where Potentially Contaminating Activity Has Occurred

The Phase One ESA determined the Potentially Contaminating Activity (PCA) at the subject site and in the Phase One Study Area based on the records review, interviews and site reconnaissance. The area of PCA along with the corresponding list in Table 2 Schedule D of O. Reg. 153/04 is summarized below:

On-site PCAs:

- River Oaks Photo with photo processing records was reported at the northwestern portion of the subject site. It is not listed in the Table 2 of Schedule D of O.Reg. 153/04. Other: Photo processing
- Northwestern portion of plaza was burnt in the past. It is not listed in the Table 2 of Schedule D of O.Reg. 153/04. Other: Fire Incident

Additional one (1) onsite PCA (#30 - Importation of Fill Material of Unknown Quality) was identified during the Phase Two ESA.

The on-site are considered to have contributed to the Areas of Potential Environmental Concerns at the subject site.

The PCAs are shown in Drawing No. 1.

6.10.1.2 Areas of Potential Environmental Concern

The following Areas of Potential Environmental Concern (APECs) at the subject site were identified:

APEC 1: Potential soil and groundwater impact due to the photo processing at the northwestern portion of the subject site.

APEC 2: Potential soil impact due to the fire incident at the northwestern portion of the subject site.

APEC 3: Potential soil impact due to unknown quality of fill material underneath the subject site building at the northwestern portion of the subject site.

The PCAs and APECs are shown on Drawing Nos. 1 and 2, respectively.

6.10.1.3 Subsurface Structures and Utilities

At the time of the site inspection, the subject site is mainly comprised of four (4) commercial buildings and one (1) garbage shed. The remaining property is used for parking with some landscaping.

Since no contaminants are identified at the subject site at a concentration above the applicable site condition standard, no subsurface structures or utilities with potential to affect contaminants distribution or transport are identified at the subject site.

6.10.2 **Physical Setting**

6.10.2.1 Stratigraphy

A review of a Geological Map of the area, located at the Ontario Geological Survey indicates the subject site is underlain on Halton Till Material, which is predominantly silt to silty clay matrix, high in matrix carbonate content and clast poor. Bedrock in the area of the subject site consists of Queenston Formation, and the rock description is limestone, dolostone, shale, and siltstone.

According to the Bedrock Cross Section Viewer, the depth of bedrock in the general vicinity of the subject site is approximately 6 mbgs.

The field investigation for the Phase Two ESA consisted of drilling ten (10) boreholes to the depths ranging from 1.5 mbgs to 9.1 mbgs and installing five (5) monitoring wells at the selected borehole locations. The subsoil condition at the borehole locations indicate a layer of asphalt/concrete and fill material including granular, sand and sandy silt or topsoil at the ground surface, followed by silty clay till and weathered shale. The subject site is underlain by

silty clay till and weathered shale at various depths and locations. Weathered shale was encountered below 2.0 mbgs during the Phase Two ESA. The cross section to show the stratigraphy of the subject site is presented in Drawing Nos. 3 and 4.

6.10.2.2 Hydrogeological Characteristics

The overall grade of the subject site generally descends towards the southeast. A watershed map provided by Land Information Ontario (LIO) Watershed shows the subject site is located within the Sixteen Mile Creek Watershed. Based on the inferred topography of the area from topographic maps, precipitation runoff is expected to flow in southeast direction.

Five (5) monitoring wells were installed at the selected borehole locations during the combined geological, hydrological and environmental investigations at the subject site. The monitoring wells were installed at various depths, within the weathered shale. Based on the groundwater records and our investigation in this Phase Two ESA, the groundwater flow direction appears to be to the east to southeast. The shallow groundwater contours and interpreted groundwater flow direction are shown on Drawing No. 5.

Based on the groundwater records of the site investigation for the Phase Two ESA, the horizontal hydraulic gradient for the investigated aquifer at the subject site ranges from 0.001 m/m to 0.02 m/m (average 0.01 m/m).

6.10.2.3 Approximate Depth to Bedrock

Weathered shale was encountered at the subject site during the field investigation below 2.0 mbgs. According to the Ontario Geological Survey Bedrock Cross Section Viewer, the depth to bedrock in the general vicinity of the subject site is approximately 6 m.

6.10.2.4 Approximate Depth to Water Table

Based on the groundwater monitoring records for this investigation, a depth to the groundwater table at the subject site ranges from 5.1 mbgs to 5.7 mbgs.

6.10.2.5 Section 41 or 43.1 of the Regulation

The subject site is not within/adjacent/part of an area of natural significance and the analytical testing indicated the pH of the tested surface soil samples is between 5 and 9 and subsurface soil sample is between 5 and 11. Therefore, Section 41 of the regulation (Site Condition Standards, Environmental Sensitive Areas) does not to the subject site.

The property is not a shallow soil property, as the bedrock was not encountered within 2.0 mbgs during the investigation. There is no waterbody at the subject site and within 30 m to the site's boundary. Therefore, Section 43.1 of the Regulation (Site Condition Standards, Water Body) does not apply to the subject site.

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

The findings of our Phase One ESA indicated no fill material of unknown quality is located at the subject site. However, fill material was tested during our Phase Two investigation.

6.10.2.7 Proposed Building and Other Structures

A mixed-use development proposed for the subject site. It is anticipated that the new development will be provided with municipal services meeting urban standards. The locations of proposed building or any other structures were not known at the time of preparation of this Phase Two Conceptual Site Model.

6.10.3 **Contamination In or Under the Phase Two Property**

Based on the findings of the Phase One ESA, contaminants of potential concern in soil with respect to the identified APEC at the subject site were assessed during the Phase Two ESA. Based on the information obtained from the Phase One ESA and Phase Two ESA, the Ministry of the Environment, Conservation and Parks (MECP) Table 2, Generic Site Condition Standards for Shallow Soils in a Potable Ground Water Condition for Residential/ Parkland/Institutional Property Use and coarse textured soils as published in the "Soil, Ground

Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011 (Table 2 Standards).

6.10.3.1 Area Where Contaminants are Present

Soil and groundwater samples were collected during the Phase Two ESA and submitted for chemical analysis of one or more of the following parameter: Metals and/or inorganic parameters, Petroleum Hydrocarbon (PHCs), Volatile Organic Compounds (VOCs), metals pH, and Polyciclyc Aromatic Hydrocarbons (PAHs).

A review of the analytical test results of soil and groundwater samples indicates that the tested parameters at the test locations meet the Table 2 Standards.

Consequently, there are no contaminants identified at the subject site at a concentration above the applicable site condition standards (Table 2 Standards) during the Phase Two ESA.

6.10.3.2 Distribution of Contaminants

No contaminants are identified at the subject site at a concentration above applicable site condition standards.

6.10.3.3 Contaminant Medium

No contaminants are identified at the subject site at a concentration above applicable site condition standards.

6.10.3.4 Reasons for Discharge

No contaminants are identified at the subject site at a concentration above applicable site condition standards.

6.10.3.5 Migration of Contaminants

No contaminants are identified at the subject site at a concentration above applicable site condition standards.

6.10.4 Potential Exposure Pathways and Receptors

Since no contaminants are found at the subject site at a concentration above the applicable site condition standard (Table 2 Standards), no potential exposure pathways and receptors are identified.

7.0 CONCLUSIONS

The purpose of the Phase Two Environmental Site Assessment (Phase Two ESA) was to determine the soil and groundwater quality at the subject site, as related to the following Area of Potential Environmental Concerns (APEC) identified in our Phase One Environmental Site Assessment (Phase One ESA) and during Phase Two ESA at the subject site:

APEC 1: Potential soil and groundwater impact due to the photo processing at the northwestern portion of the subject site.

APEC 2: Potential soil impact due to the fire incident at the northwestern portion of the subject site.

APEC 3: Potential soil impact due to unknown quality of fill material underneath the subject site building at the northwestern portion of the subject site.

The findings of the field investigation and analytical results of the Phase Two ESA summarized below:

- Conduct ten (10) boreholes to the depths ranging from 1.5 meter below existing ground surface (mbgs) to 9.1 mbgs during combined environmental, geotechnical and hydrogeological investigation.
- The subsoil condition at the borehole locations indicate a layer of asphalt/concrete and fill material including granular, sand and sandy silt or topsoil at the ground surface, followed by silty clay till and weathered shale.The subject site is underlain by silty clay till and weathered shale at various depths and locations. Weathered shale was encountered below 2.0 mbgs during the Phase Two ESA.
- Head space vapour screening was conducted for all retrieved soil samples using an organic gas detector (RKI Eagle) in methane elimination mode, calibrated with hexane and having a minimum detection level of 0.1 ppmv (parts per million by volume). Soil vapour was non detected in the soil samples retrieved from the sampling locations.
- Based on the soil vapour measurements and visual and olfactory observations, representative "worst case" soil samples were selected from the sampling locations for chemical analyses of Petroleum Hydrocarbons (PHCs), Volatile Organic Compounds (VOCs), Polyciclyc Aromatic Hydrocarbons (PAHs), pH and metals parameters.

- Groundwater samples collected from the monitoring wells were submitted for analysis of VOCs, PHCs, PAHs and metals.
- As part of the Quality Assurance/Quality Control (QA/QC) program for the Phase Two ESA, QC samples in the form of field duplicate and trip blank samples were analysed. Field duplicate samples were collected in the field for metals in soil, and for benzene, toluene, ethylbenzene and xylene (BTEX) and PHC F1 in groundwater. One (1) trip blank for BTEX and PHC F1was shipped with the batches of the groundwater samples submitted for analysis.
- The analytical test results were reviewed using the Table 2, Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for Residential/ Parkland/Institutional Property Use and coarse textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), dated April 15, 2011 (Table 2 Standards).
- The test results indicate that the concentration of tested parameters in the tested soil and groundwater samples meet the Table 2 Standards.
- The result of the analysis of the duplicate samples is similar to the results for the original sample and relative percent differences (RPD) for the detectable tested parameters are within acceptable range. However, the RPDs could not be calculated between the original and duplicate samples in the situation where the original and/or duplicate samples were below the laboratory reported laboratory detection limit (RDLs).
- The result of the trip blank sample indicates that the sample was below the RDLs. There was no issue with the trip blank that was shipped with the batch of the groundwater samples submitted for analysis.

A review of the analytical test results of soil and groundwater samples indicates the tested parameters at the test locations meet the Table 2 Standards. Consequently, there are no contaminants identified at the subject site at a concentration above the applicable site condition standards during the Phase Two ESA.

Based on the findings of the Phase Two ESA, it is our opinion that the property is suitable for the proposed development. No further environmental investigation is recommended at this time.

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8.0 REFERENCES

Information in the Public Domain

Environmental Protection Act (EPA). Part VII of Ontario Regulation 511/09. The Ontario Ministry of the Environment, Conservation and Parks (MECP). (Amended 2009)

MECP Guidance Manual (MECP). "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario, May 1996" revised December 1996. MOE. (1996)

MECP. "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), March 9, 2004.

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TABLES

REFERENCE NO. 1908-E077

Table I – Monitoring Well Installation

Monitoring Well I.D.	Bottom of Monitoring Well (mbgs)	Screen Length (m)	Screen Interval (m)	Filter Pack (m)	Bentonite Plug (m)
BH/MW1	9.1	3.0	6.1-9.1	5.4-9.1	0.3-5.4
BH/MW2	9.1	3.0	6.1-9.1	5.4-9.1	0.3-5.4
BH/MW4	6.1	3.0	3.1-6.1	2.5-6.1	0.3-2.5
BH/MW7	8.9	3.0	5.7-8.7	5.3-8.9	0.3-5.3
BH/MW8	9.1	3.0	6.4-9.4	5.4-9.1	0.3-5.4

Note: mbgs – meters below ground surface

Table II – Water Levels

Monitoring Well No.	Ground Elevation (masl)	Measured Groundwater Level		Field Observations		
		October 10, 2019				
		Depth (mbgs)	Elevation (m)	Odour	Colour	Sheen or Free Product
BH/MW1	148.60	5.20	143.40	None	Clear	None
BH/MW2	148.60	5.10	143.50	None	Clear	None
BH/MW4	147.50	5.20	142.30	None	Clear	None
BH/MW7	147.00	5.30	141.70	None	Clear	None
BH/MW8	146.90	5.70	141.20	None	Clear	None

Note: mbgs = meters below ground surface
masl = meters above sea level

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Table III

SOIL CHEMICAL ANALYSIS - Metals and Inorganic Parameters

Project No. 1908-E077

Sample ID	RDL*	BH9/1	BH10/1	BH1/7	DUP1	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		07-October-2019	07-October-2019	07-October-2019	07-October-2019	
Laboratory ID		KZK050	KZK052	LCZ399	KZK054	
Bore Hole No.		BH9	BH10	BH1	BH10	
Depth (mbgs)		0-0.9	0-0.9	6	0-0.9	
Antimony	0.2	0.25	0.33	-	0.33	7.5
Arsenic	1	4.5	5.5	-	4.9	18
Barium	0.5	150	120	-	130	390
Beryllium	0.2	0.62	0.76	-	0.72	4
Boron (Hot Water Soluble)	0.05	0.092	0.072	-	-	1.5
Cadmium	0.1	0.2	0.14	-	0.11	1.2
Chromium	1	19	22	-	21	160
Chromium VI	0.2	<0.2	<0.2	-	-	8
Cobalt	0.1	11	13	-	15	22
Copper	0.5	16	18	-	17	140
Lead	1	11	10	-	9.7	120
Mercury	0.05	<0.050	<0.050	-	<0.050	0.27
Molybdenum	0.5	1	0.58	-	0.65	6.9
Nickel	0.5	24	28	-	27	100
Selenium	0.5	<0.50	<0.50	-	<0.50	2.4
Silver	0.2	<0.20	<0.20	-	<0.20	20
Thallium	0.05	0.1	0.11	-	0.11	1
Vanadium	5	26	31	-	28	86
Zinc	5	79	59	-	55	340
pH (pH Units)		8.08	-	8.18	-	NV
Conductivity (ms/cm)	-	-	-	-		0.7
Sodium Adsorption Ratio	-	-	-	-	-	5
Cyanide, Free	0.01	<0.01	<0.01	-	-	0.051
Chloride	-	-	-	-	-	NV
Boron (Total)	5	17	17	-	14	120
Uranium	0.05	0.6	0.59	-	0.58	23

Analysis by Maxxam Analytics all results in ppm (µg/g) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standards in a Potable Ground Water Condition property use (coarse textured soils)

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SOIL CHEMICAL ANALYSIS - Petroleum Hydrocarbon (PHC) Parameters

Project No. 1908-E077

Sample ID	RDL*	BH9/2	BH10/2	Ontario Regulation 153/04 2 Standards**
Sample Date		07-October-2019	07-October-2019	
Laboratory ID		KZK051	KZK053	
Bore Hole No.		BH9	BH10	
Depth (mbgs)		0.9-1.2	0.9-1.2	
Benzene	-	-	-	0.21
Toluene	-	-	-	2.3
Ethylbenzene	-	-	-	1.1
m/p xylenes	-	-	-	NV
o xylene	-	-	-	NV
Total Xylenes	-	-	<10	3.1
F1 (C6-C10)	10	<10	<10	55
F1 (C6-C10) - BTEX	10	<10	<10	55
F2 (C10-C16)	10	<10	<50	98
F3 (C16-C34)	50	<50	<50	300
F4 (C34-C50)	50	<50	<50	2800

Analysis by Maxxam Analytics, all results in ppm (µg/g) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standards in a Potable Ground Water Condition property use (coarse textured soils)

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Table III

SOIL CHEMICAL ANALYSIS - Volatile Organic Compound (VOC) Parameters

Project No. 1908-E077

Sample ID	RDL*	BH9/2	BH10/2	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		07-October-2019	07-October-2019	
Laboratory ID		KZK051	KZK053	
Bore Hole No.		BH9	BH10	
Depth (mbgs)		0.9-1.2	0.9-1.2	
Acetone	0.50	<0.50	<0.50	16.00
Benzene	0.02	<0.020	<0.020	0.21
Bromodichloromethane	0.05	<0.050	<0.050	1.50
Bromoform	0.05	<0.050	<0.050	0.27
Bromomethane	0.05	<0.050	<0.050	0.05
Carbon Tetrachloride	0.05	<0.050	<0.050	0.05
Chlorobenzene	0.05	<0.050	<0.050	2.40
Chloroform	0.05	<0.050	<0.050	0.05
Dibromochloromethane	0.05	<0.050	<0.050	2.30
1,2-Dichlorobenzene	0.05	<0.050	<0.050	1.20
1,3-Dichlorobenzene	0.05	<0.050	<0.050	4.80
1,4-Dichlorobenzene	0.05	<0.050	<0.050	0.08
1,1-Dichloroethane	0.05	<0.050	<0.050	0.47
1,2-Dichloroethane	0.05	<0.050	<0.050	0.05
1,1-Dichloroethylene	0.05	<0.050	<0.050	0.05
Cis-1,2-Dichloroethylene	0.05	<0.050	<0.050	1.90
Trans-1,2-Dichloroethylene	0.05	<0.050	<0.050	0.08
1,2-Dichloropropane	0.05	<0.050	<0.050	0.05
Cis-1,3-Dichloropropylene	0.03	<0.030	<0.030	NV
Trans-1,3-Dichloropropylene	0.04	<0.040	<0.040	NV
Ethylbenzene	0.02	<0.020	<0.020	1.10
Ethylene Dibromide	0.05	<0.050	<0.050	0.05
Methyl Ethyl Ketone	0.50	<0.50	<0.50	16.00
Methylene Chloride	0.05	<0.050	<0.050	0.10
Methyl Isobutyl Ketone	0.50	<0.50	<0.50	1.70
Methyl-t-Butyl Ether	0.05	<0.050	<0.050	0.75
Styrene	0.05	<0.050	<0.050	0.70
1,1,1,2-Tetrachloroethane	0.05	<0.050	<0.050	0.06
1,1,2,2-Tetrachloroethane	0.05	<0.050	<0.050	0.05
Toluene	0.02	<0.020	<0.020	2.30
Tetrachloroethylene	0.05	<0.050	<0.050	0.28
1,1,1-Trichloroethane	0.05	<0.050	<0.050	0.38
1,1,2-Trichloroethane	0.05	<0.050	<0.050	0.05
Trichloroethylene	0.05	<0.050	<0.050	0.06
Vinyl Chloride	0.02	<0.020	<0.020	0.02
m-Xylene & p-Xylene	0.02	<0.020	<0.020	NV
o-Xylene	0.02	<0.020	<0.020	NV
Total Xylenes	0.02	<0.020	<0.020	3.10
Dichlorodifluoromethane	0.05	<0.050	<0.050	16.00
Dioxane, 1,4-	-	-	-	1.80
Hexane(n)	0.05	<0.050	<0.050	2.80
Trichlorofluoromethane	0.05	<0.050	<0.050	4.00
1,3-Dichloropropene (cis + trans)	0.05	<0.050	<0.050	0.05

Analysis by Maxxam Analytics, all results in ppm (µg/g) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standards in a Potable Ground Water Condition property use (coarse textured soils)

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SOIL CHEMICAL ANALYSIS - PAH Parameters

Project No.1908-E077

Sample ID	RDL*	BH9/2	BH10/2	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		07-October-2019	07-October-2019	
Laboratory ID		KZK051	KZK053	
Bore Hole No.		BH9	BH10	
Depth (mbgs)		0.9-1.2	0.9-1.2	
Acenaphthene	0.005	<0.0050	<0.0050	7.9
Acenaphthylene	0.005	<0.0050	<0.0050	0.15
Anthracene	0.005	<0.0050	<0.0050	0.67
Benzo(a)anthracene	0.005	<0.0050	<0.0050	0.5
Benzo(a)pyrene	0.005	<0.0050	<0.0050	0.3
Benzo(b/j)fluoranthene	0.005	<0.0050	<0.0050	0.78
Benzo(ghi)perylene	0.005	<0.0050	<0.0050	6.6
Benzo(k)fluoranthene	0.005	<0.0050	<0.0050	0.78
Chrysene	0.005	<0.0050	<0.0050	7
Dibenzo(a,h)anthracene	0.005	<0.0050	<0.0050	0.1
Fluoranthene	0.005	<0.0050	<0.0050	0.69
Fluorene	0.005	<0.0050	<0.0050	62
Indeno(1,2,3-cd)pyrene	0.005	<0.0050	<0.0050	0.38
1-Methylnaphthalene	0.005	<0.0050	<0.0050	0.99
2-Methylnaphthalene	0.005	<0.0050	<0.0050	0.99
Naphthalene	0.005	<0.0050	<0.0050	0.6
Phenanthrene	0.005	<0.0050	<0.0050	6.2
Pyrene	0.005	<0.0050	<0.0050	78
Methylnaphthalene, 2-(1-)	-	-	-	0.99

Analysis by Maxxam Analytics, all results in ppm (µg/g) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standardsfor use in a Potable Ground Water Condition property use (coarse textured soils)

Soil Engineers Ltd

Table IV

GROUND WATER CHEMICAL ANALYSIS - Metals and Inorganic Parameters

Project No. 1908-E077

Sample ID	RDL*	MW	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		23-Oct-2019	
Laboratory ID		LCZ401	
Bore Hole No.		MW4	
Antimony	0.5	<0.50	6
Arsenic	1	<1.0	25
Barium	2	250	1000
Beryllium	0.5	<0.50	4
Boron	10	61	5000
Cadmium	0.1	<0.10	2.1
Chromium	5	<5.0	50
Chromium VI	-	-	25
Cobalt	0.5	1.4	3.8
Copper	1	6	69
Lead	0.5	<0.50	10
Mercury	-	-	0.1
Molybdenum	0.5	0.64	70
Nickel	1	2.3	100
Sodium	-	-	490000
Selenium	2	<2.0	10
Silver	0.1	<0.10	1.2
Thallium	0.05	<0.050	2
Vanadium	0.5	<0.50	6.2
Zinc	5	<5.0	890
Cyanide, Free	-	-	52
Uranium	0.1	0.65	20

Analysis by Maxxam Analytics, all results in ppm (µg/L) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for all types of property use (coarse textured soils)

Soil Engineers Ltd

GROUND WATER CHEMICAL ANALYSIS - Petroleum Hydrocarbon (PHC) Parameters

Project No. 1908-E077

Sample ID	RDL*	TB	MW	DUPMW	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		23-Oct-2019	23-Oct-2019	23-Oct-2019	
Laboratory ID		LCZ400	LCZ401	LCZ402	
Bore Hole No.		-	MW4	MW4	
Benzene	0.2	<0.20	-	<0.20	0.5
Toluene	0.2	<0.20	-	<0.20	24
Ethylbenzene	0.2	<0.20	-	<0.20	2.4
m/p xylenes	0.4	<0.40	-	<0.40	NV
o xylene	0.2	<0.20	-	<0.20	NV
Total Xylenes	0.4	<0.40	-	<0.40	72
F1 (C6-C10)	25	<25	<25	<25	420
F1 (C6-C10) - BTEX	25	<25	<25	<25	420
F2 (C10-C16)	100	-	<100	-	150
F3 (C16-C34)	200	-	<200	-	500
F4 (C34-C50)	200	-	<200	-	500

Analysis by Maxxam Analytics, all results in ppm (µg/L) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standards in a Potable Ground Water Condition for all types of property use (coarse textured soils)

Soil Engineers Ltd

Table IV

GROUND WATER CHEMICAL ANALYSIS - PAH Parameters

Project No. 1908-E077

Sample ID	RDL*	MW	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		23-Oct-2019	
Laboratory ID		LCZ401	
Bore Hole No.		MW4	
Acenaphthene	0.05	<0.050	4.1
Acenaphthylene	0.05	<0.050	1
Anthracene	0.05	<0.050	1
Benzo(a)anthracene	0.05	<0.050	1
Benzo(a)pyrene	0.01	<0.010	0.01
Benzo(b/j)fluoranthene	0.05	<0.050	0.1
Benzo(ghi)perylene	0.05	<0.050	0.2
Benzo(k)fluoranthene	0.05	<0.050	0.1
Chrysene	0.05	<0.050	0.1
Dibenzo(a,h)anthracene	0.05	<0.050	0.2
Fluoranthene	0.05	<0.050	0.41
Fluorene	0.05	<0.050	120
Indeno(1,2,3-cd)pyrene	0.05	<0.050	0.2
1-Methylnaphthalene	0.05	<0.050	3.2
2-Methylnaphthalene	0.05	<0.050	3.2
Naphthalene	0.05	<0.050	7
Phenanthrene	0.03	<0.030	1
Pyrene	0.05	<0.050	4.1
Methylnaphthalene, 2-(1-)	-	-	3.2

Analysis by Maxxam Analytics, all results in ppm (µg/L) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Generic Site Condition Standards in a Potable Ground Water Condition for all types of property use (coarse textured soils)

Soil Engineers Ltd

GROUND WATER CHEMICAL ANALYSIS - Volatile Organic Compound (VOC) Parameters

Project No. 1908-E077

Sample ID	RDL*	MW	Ontario Regulation 153/04 Table 2 Standards**
Sample Date		23-Oct-2019	
Laboratory ID		LCZ401	
Bore Hole No.		MW4	
Acetone	10	<10	2700
Benzene	0.2	<0.20	0.5
Bromodichloromethane	0.5	<0.50	16
Bromoform	1	<1.0	5
Bromomethane	0.5	<0.50	0.89
Carbon Tetrachloride	0.2	<0.20	0.2
Chlorobenzene	0.2	<0.20	30
Chloroform	0.2	<0.20	2
Dibromochloromethane	0.5	<0.50	25
1,2-Dichlorobenzene	0.5	<0.50	3
1,3-Dichlorobenzene	0.5	<0.50	59
1,4-Dichlorobenzene	0.5	<0.50	0.5
1,1-Dichloroethane	0.2	<0.20	5
1,2-Dichloroethane	0.5	<0.50	0.5
1,1-Dichloroethylene	0.2	<0.20	0.5
Cis-1,2-Dichloroethylene	0.5	<0.50	1.6
Trans-1,2-Dichloroethylene	0.5	<0.50	1.6
1,2-Dichloropropane	0.2	<0.20	0.58
Cis-1,3-Dichloropropylene	0.3	<0.30	NV
Trans-1,3-Dichloropropylene	0.4	<0.40	NV
Ethylbenzene	0.2	<0.20	2.4
Ethylene Dibromide	0.2	<0.20	0.2
Methyl Ethyl Ketone	10	<10	1800
Methylene Chloride	2	<2.0	26
Methyl Isobutyl Ketone	5	<5.0	640
Methyl-t-Butyl Ether	0.5	<0.50	15
Styrene	0.5	<0.50	5.4
1,1,1,2-Tetrachloroethane	0.5	<0.50	1.1
1,1,2,2-Tetrachloroethane	0.5	<0.50	0.5
Toluene	0.2	<0.20	24
Tetrachloroethylene	0.2	<0.20	0.5
1,1,1-Trichloroethane	0.2	<0.20	23
1,1,2-Trichloroethane	0.5	<0.50	0.5
Trichloroethylene	0.2	<0.20	0.5
Vinyl Chloride	0.2	<0.20	0.5
m-Xylene & p-Xylene	0.2	<0.20	NV
o-Xylene	0.2	<0.20	NV
Total Xylenes	0.2	<0.20	72
Dichlorodifluoromethane	1	<1.0	590
Dioxane, 1,4-	-	-	50
Hexane(n)	1	<1.0	5
Trichlorofluoromethane	0.5	<0.50	150
1,3-Dichloropropene (cis + trans)	0.5	<0.50	0.5

Maxxam Analytics, all results in ppm (µg/L) unless otherwise stated

* Analytical Reportable Detection Limits (RDLs) are shown except as indicated in brackets.

** Standards shown are for Table 2 Full Depth Generic Site Condition Standards in a Potable Ground Water Condition for all types of property use (coarse textured soils)

Summary of Metals and Inorganics

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Antimony	ug/g	0.33	BH10/1	0-0.9
Arsenic	ug/g	5.5	BH10/1	0-0.9
Barium	ug/g	150	BH9/1	0-0.9
Beryllium	ug/g	0.76	BH10/1	0-0.9
Boron (Hot Water Soluble)	ug/g	0.092	BH9/1	0-0.9
Cadmium	ug/g	0.2	BH9/1	0-0.9
Chromium	ug/g	22	BH10/1	0-0.9
Chromium VI	ug/g	<0.2	-	-
Cobalt	ug/g	13	BH10/1	0-0.9
Copper	ug/g	18	BH10/1	0-0.9
Lead	ug/g	11	BH9/1	0-0.9
Mercury	ug/g	<0.050	-	-
Molybdenum	ug/g	1	BH9/1	0-0.9
Nickel	ug/g	28	BH10/1	0-0.9
Selenium	ug/g	<0.50	-	-
Silver	ug/g	<0.20	-	-
Thallium	ug/g	0.11	BH10/1	0-0.9
Vanadium	ug/g	31	BH10/1	0-0.9
Zinc	ug/g	79	BH9/1	0-0.9
pH (pH Units)	ug/g	8.18	BH1/7	6.0
Cyanide, Free	ug/g	<0.01	-	-
Boron (Total)	ug/g	17	-	-
Uranium	ug/g	0.6	BH9/1	0-0.9

Summary of CCME F1-F4

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Benzene	ug/g	<0.02	-	-
Toluene	ug/g	<0.02	-	-
Ethylbenzene	ug/g	<0.02	-	-
Total Xylenes	ug/g	<0.04	-	-
F1 (C6-C10)	ug/g	<10	-	-
F1 (C6-C10) - BTEX	ug/g	<10	-	-
F2 (C10-C16)	ug/g	<10	-	-
F3 (C16-C34)	ug/g	<50	-	-
F4 (C34-C50)	ug/g	<50	-	-

Summary of VOCs

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Acetone	ug/g	<0.50	-	-
Benzene	ug/g	<0.020	-	-
Bromodichloromethane	ug/g	<0.050	-	-
Bromoform	ug/g	<0.050	-	-
Bromomethane	ug/g	<0.050	-	-
Carbon Tetrachloride	ug/g	<0.050	-	-
Chlorobenzene	ug/g	<0.050	-	-
Chloroform	ug/g	<0.050	-	-
Dibromochloromethane	ug/g	<0.050	-	-
1,2-Dichlorobenzene	ug/g	<0.050	-	-
1,3-Dichlorobenzene	ug/g	<0.050	-	-
1,4-Dichlorobenzene	ug/g	<0.050	-	-
1,1-Dichloroethane	ug/g	<0.050	-	-
1,2-Dichloroethane	ug/g	<0.050	-	-
1,1-Dichloroethylene	ug/g	<0.050	-	-
Cis-1,2-Dichloroethylene	ug/g	<0.050	-	-
Trans-1,2-Dichloroethylene	ug/g	<0.050	-	-
1,2-Dichloropropane	ug/g	<0.050	-	-
Cis-1,3-Dichloropropylene	ug/g	<0.030	-	-
Trans-1,3-Dichloropropylene	ug/g	<0.040	-	-
Ethylbenzene	ug/g	<0.020	-	-

Summary of VOCs (Cont'd)

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Ethylene Dibromide	ug/g	<0.050	-	-
Methyl Ethyl Ketone	ug/g	<0.50	-	-
Methylene Chloride	ug/g	<0.050	-	-
Methyl Isobutyl Ketone	ug/g	<0.50	-	-
Methyl-t-Butyl Ether	ug/g	<0.050	-	-
Styrene	ug/g	<0.050	-	-
1,1,1,2-Tetrachloroethane	ug/g	<0.050	-	-
1,1,2,2-Tetrachloroethane	ug/g	<0.050	-	-
Toluene	ug/g	<0.020	-	-
Tetrachloroethylene	ug/g	<0.050	-	-
1,1,1-Trichloroethane	ug/g	<0.050	-	-
1,1,2-Trichloroethane	ug/g	<0.050	-	-
Trichloroethylene	ug/g	<0.050	-	-
Vinyl Chloride	ug/g	<0.020	-	-
m-Xylene & p-Xylene	ug/g	<0.020	-	-
o-Xylene	ug/g	<0.020	-	-
Total Xylenes	ug/g	<0.020	-	-
Dichlorodifluoromethane	ug/g	<0.050	-	-
Hexane(n)	ug/g	-	-	-
Trichlorofluoromethane	ug/g	<0.050	-	-
1,3-Dichloropropene (cis + trans)	ug/g	<0.050	-	-

Summary of PAHs

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Acenaphthene	ug/g	<0.0050	-	-
Acenaphthylene	ug/g	<0.0050	-	-
Anthracene	ug/g	<0.0050	-	-
Benzo(a)anthracene	ug/g	<0.0050	-	-
Benzo(a)pyrene	ug/g	<0.0050	-	-
Benzo(b/j)fluoranthene	ug/g	<0.0050	-	-
Benzo(ghi)perylene	ug/g	<0.0050	-	-
Benzo(k)fluoranthene	ug/g	<0.0050	-	-
Chrysene	ug/g	<0.0050	-	-
Dibenzo(a,h)anthracene	ug/g	<0.0050	-	-
Fluoranthene	ug/g	<0.0050	-	-
Fluorene	ug/g	<0.0050	-	-
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	-	-
1-Methylnaphthalene	ug/g	<0.0050	-	-
2-Methylnaphthalene	ug/g	<0.0050	-	-
Naphthalene	ug/g	<0.0050	-	-
Phenanthrene	ug/g	<0.0050	-	-
Pyrene	ug/g	<0.0050	-	-
Methylnaphthalene, 2-(1-)	ug/g	-	-	-

Summary of Metals and Inorganics

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Antimony	ug/g	0.33	BH10/1	0-0.9
Arsenic	ug/g	5.5	BH10/1	0-0.9
Barium	ug/g	150	BH9/1	0-0.9
Beryllium	ug/g	0.76	BH10/1	0-0.9
Boron (Hot Water Soluble)	ug/g	0.092	BH9/1	0-0.9
Cadmium	ug/g	0.2	BH9/1	0-0.9
Chromium	ug/g	22	BH10/1	0-0.9
Chromium VI	ug/g	<0.2	-	-
Cobalt	ug/g	13	BH10/1	0-0.9
Copper	ug/g	18	BH10/1	0-0.9
Lead	ug/g	11	BH9/1	0-0.9
Mercury	ug/g	<0.050	-	-
Molybdenum	ug/g	1	BH9/1	0-0.9
Nickel	ug/g	28	BH10/1	0-0.9
Selenium	ug/g	<0.50	-	-
Silver	ug/g	<0.20	-	-
Thallium	ug/g	0.11	BH10/1	0-0.9
Vanadium	ug/g	31	BH10/1	0-0.9
Zinc	ug/g	79	BH9/1	0-0.9
pH (pH Units)	ug/g	8.18	BH1/7	6.0
Cyanide, Free	ug/g	<0.01	-	-
Boron (Total)	ug/g	17	-	-
Uranium	ug/g	0.6	BH9/1	0-0.9

Summary of CCME F1-F4

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Benzene	ug/g	<0.02	-	-
Toluene	ug/g	<0.02	-	-
Ethylbenzene	ug/g	<0.02	-	-
Total Xylenes	ug/g	<0.04	-	-
F1 (C6-C10)	ug/g	<10	-	-
F1 (C6-C10) - BTEX	ug/g	<10	-	-
F2 (C10-C16)	ug/g	<10	-	-
F3 (C16-C34)	ug/g	<50	-	-
F4 (C34-C50)	ug/g	<50	-	-

Summary of VOCs

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Acetone	ug/g	<0.50	-	-
Benzene	ug/g	<0.020	-	-
Bromodichloromethane	ug/g	<0.050	-	-
Bromoform	ug/g	<0.050	-	-
Bromomethane	ug/g	<0.050	-	-
Carbon Tetrachloride	ug/g	<0.050	-	-
Chlorobenzene	ug/g	<0.050	-	-
Chloroform	ug/g	<0.050	-	-
Dibromochloromethane	ug/g	<0.050	-	-
1,2-Dichlorobenzene	ug/g	<0.050	-	-
1,3-Dichlorobenzene	ug/g	<0.050	-	-
1,4-Dichlorobenzene	ug/g	<0.050	-	-
1,1-Dichloroethane	ug/g	<0.050	-	-
1,2-Dichloroethane	ug/g	<0.050	-	-
1,1-Dichloroethylene	ug/g	<0.050	-	-
Cis-1,2-Dichloroethylene	ug/g	<0.050	-	-
Trans-1,2-Dichloroethylene	ug/g	<0.050	-	-
1,2-Dichloropropane	ug/g	<0.050	-	-
Cis-1,3-Dichloropropylene	ug/g	<0.030	-	-
Trans-1,3-Dichloropropylene	ug/g	<0.040	-	-
Ethylbenzene	ug/g	<0.020	-	-

Summary of VOCs (Cont'd)

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Ethylene Dibromide	ug/g	<0.050	-	-
Methyl Ethyl Ketone	ug/g	<0.50	-	-
Methylene Chloride	ug/g	<0.050	-	-
Methyl Isobutyl Ketone	ug/g	<0.50	-	-
Methyl-t-Butyl Ether	ug/g	<0.050	-	-
Styrene	ug/g	<0.050	-	-
1,1,1,2-Tetrachloroethane	ug/g	<0.050	-	-
1,1,2,2-Tetrachloroethane	ug/g	<0.050	-	-
Toluene	ug/g	<0.020	-	-
Tetrachloroethylene	ug/g	<0.050	-	-
1,1,1-Trichloroethane	ug/g	<0.050	-	-
1,1,2-Trichloroethane	ug/g	<0.050	-	-
Trichloroethylene	ug/g	<0.050	-	-
Vinyl Chloride	ug/g	<0.020	-	-
m-Xylene & p-Xylene	ug/g	<0.020	-	-
o-Xylene	ug/g	<0.020	-	-
Total Xylenes	ug/g	<0.020	-	-
Dichlorodifluoromethane	ug/g	<0.050	-	-
Hexane(n)	ug/g	-	-	-
Trichlorofluoromethane	ug/g	<0.050	-	-
1,3-Dichloropropene (cis + trans)	ug/g	<0.050	-	-

Summary of PAHs

Parameter	Unit	Maximum Concentration	Sample ID	Sampling Depth (m)
Acenaphthene	ug/g	<0.0050	-	-
Acenaphthylene	ug/g	<0.0050	-	-
Anthracene	ug/g	<0.0050	-	-
Benzo(a)anthracene	ug/g	<0.0050	-	-
Benzo(a)pyrene	ug/g	<0.0050	-	-
Benzo(b/j)fluoranthene	ug/g	<0.0050	-	-
Benzo(ghi)perylene	ug/g	<0.0050	-	-
Benzo(k)fluoranthene	ug/g	<0.0050	-	-
Chrysene	ug/g	<0.0050	-	-
Dibenzo(a,h)anthracene	ug/g	<0.0050	-	-
Fluoranthene	ug/g	<0.0050	-	-
Fluorene	ug/g	<0.0050	-	-
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	-	-
1-Methylnaphthalene	ug/g	<0.0050	-	-
2-Methylnaphthalene	ug/g	<0.0050	-	-
Naphthalene	ug/g	<0.0050	-	-
Phenanthrene	ug/g	<0.0050	-	-
Pyrene	ug/g	<0.0050	-	-
Methylnaphthalene, 2-(1-)	ug/g	-	-	-

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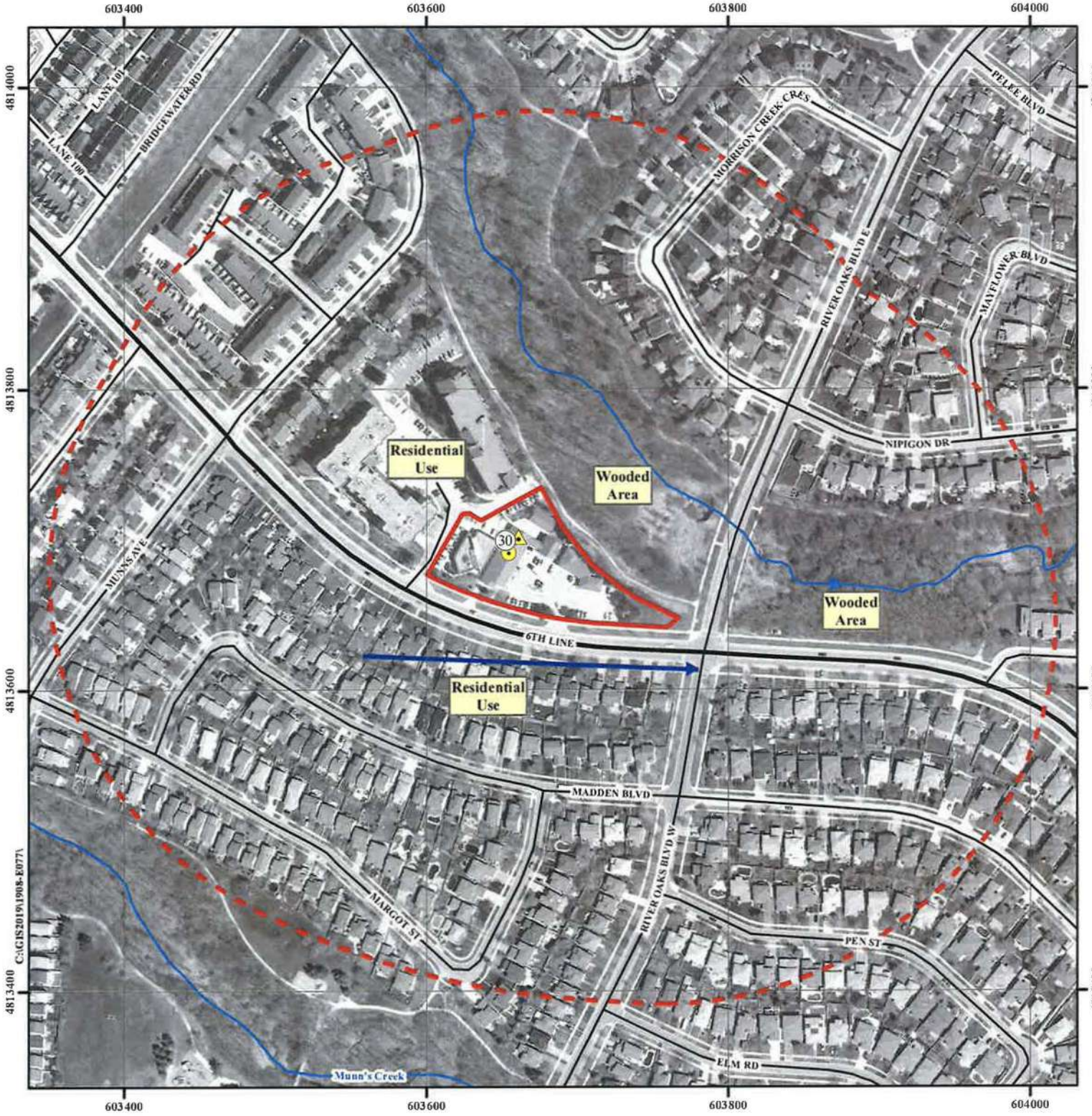
DRAWINGS

REFERENCE NO. 1908-E077



N

Subject Site

Phase One Study Area

Inferred Groundwater Flow Direction

Watercourse

Major Road

Local Road

Potentially Contaminating Activities (PCAs)

(30) Importation of Fill Material of Unknown Quality

Additional Potential Sources of Contamination

Other - Photo Processing

Other - Fire

Soil Engineers Ltd.

Title: Site Location Plan

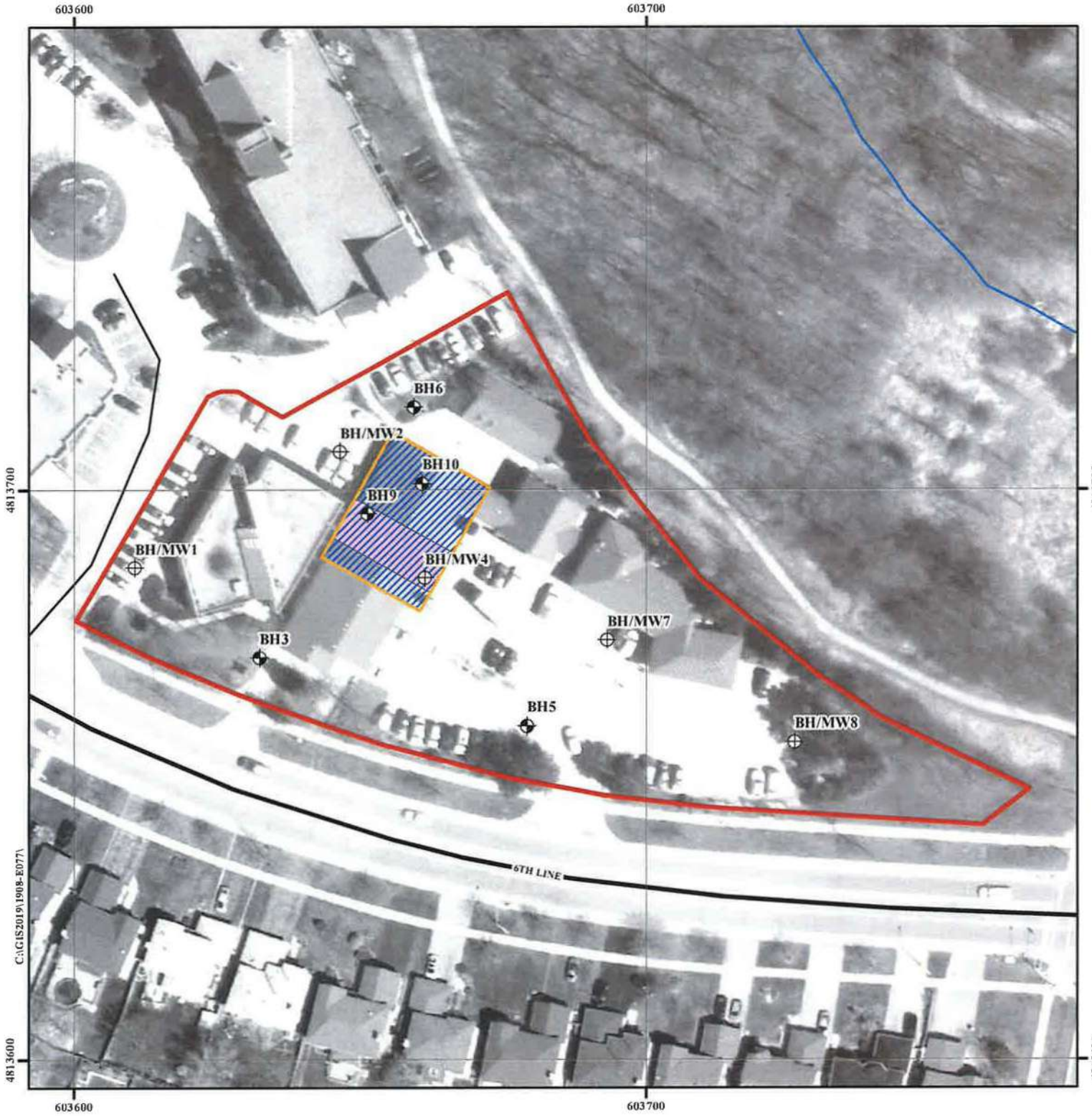
Project:
Proposed Mixed-Use Buildings
2163 and 2169 Sixth Line
Town of Oakville

Reference No. 1908-E077

Date: November 12, 2019

Scale:
0 15 30 60 90 120 150
Metres

Drawing No. 1



N

Subject Site

Borehole

Borehole with Monitoring Well

Watercourse

Major Road

Local Road

Areas of Potential Environmental Concern (APEC)

APEC 1

APEC 2

APEC 3

Soil Engineers Ltd.

Title: Sampling Location Plan

Project:
Proposed Mixed-Use Buildings
2163 and 2169 Sixth Line
Town of Oakville

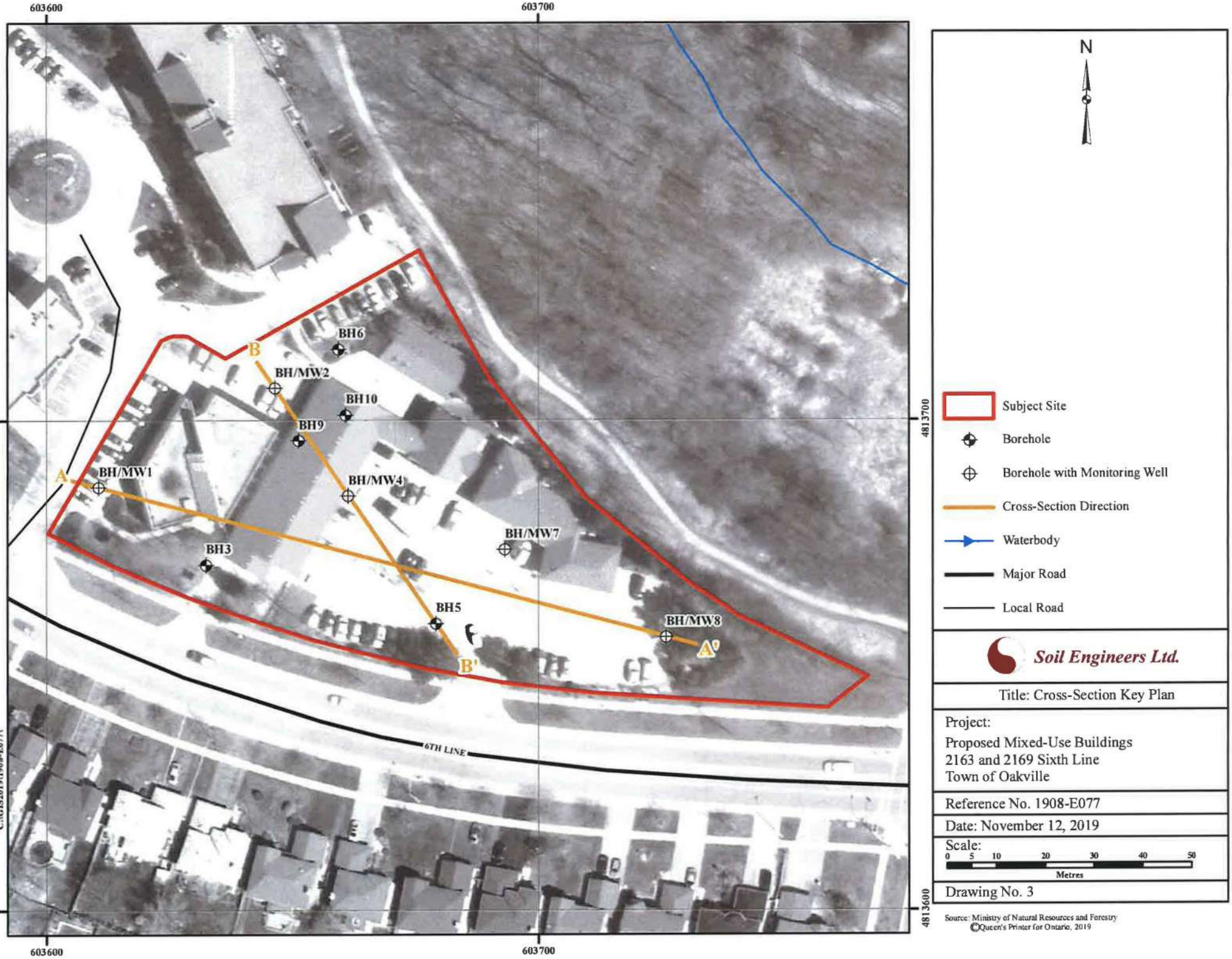
Reference No. 1908-E077

Date: November 12, 2019

Scale:
0 5 10 20 30 40 50
Metres

Drawing No. 2

Source: Ministry of Natural Resources and Forestry


603600
603700
4813700
4813600
BH6
BH/MW2
BH10
BH9
BH/MW1
BH/MW4
BH/MW7
BH3
BH5
BH/MW8
A
A'
B
B'
6TH LINE
C:\GIS2019\1908-E077\
N
Subject Site
Borehole
Borehole with Monitoring Well
Cross-Section Direction
Waterbody
Major Road
Local Road
Soil Engineers Ltd.
Title: Cross-Section Key Plan
Project:
Proposed Mixed-Use Buildings
2163 and 2169 Sixth Line
Town of Oakville
Reference No. 1908-E077
Date: November 12, 2019
Scale:
0 5 10 20 30 40 50
Metres
Drawing No. 3
Source: Ministry of Natural Resources and Forestry
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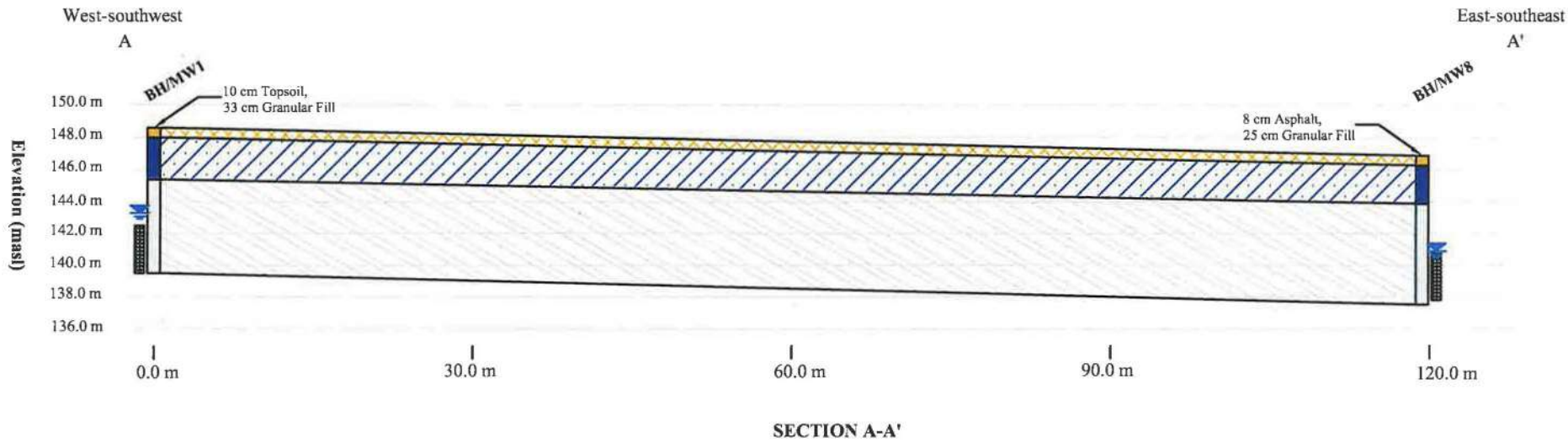
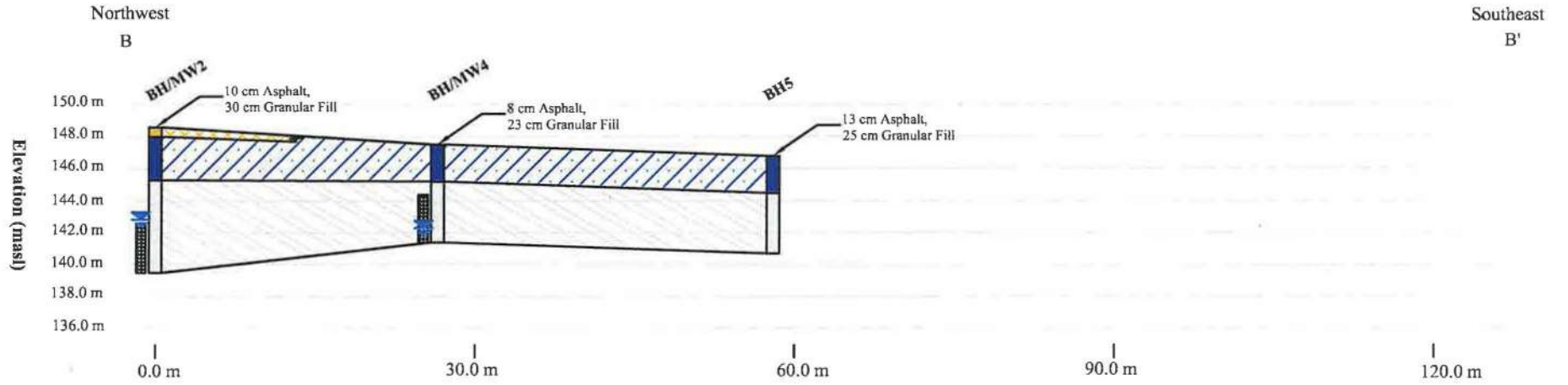
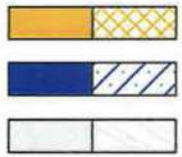


SECTION A-A'



SECTION B-B'



Fill Material

Silty Clay, Till

Weathered Shale

Water Table

Screen

C: Projects/2019/obs/1908-E077

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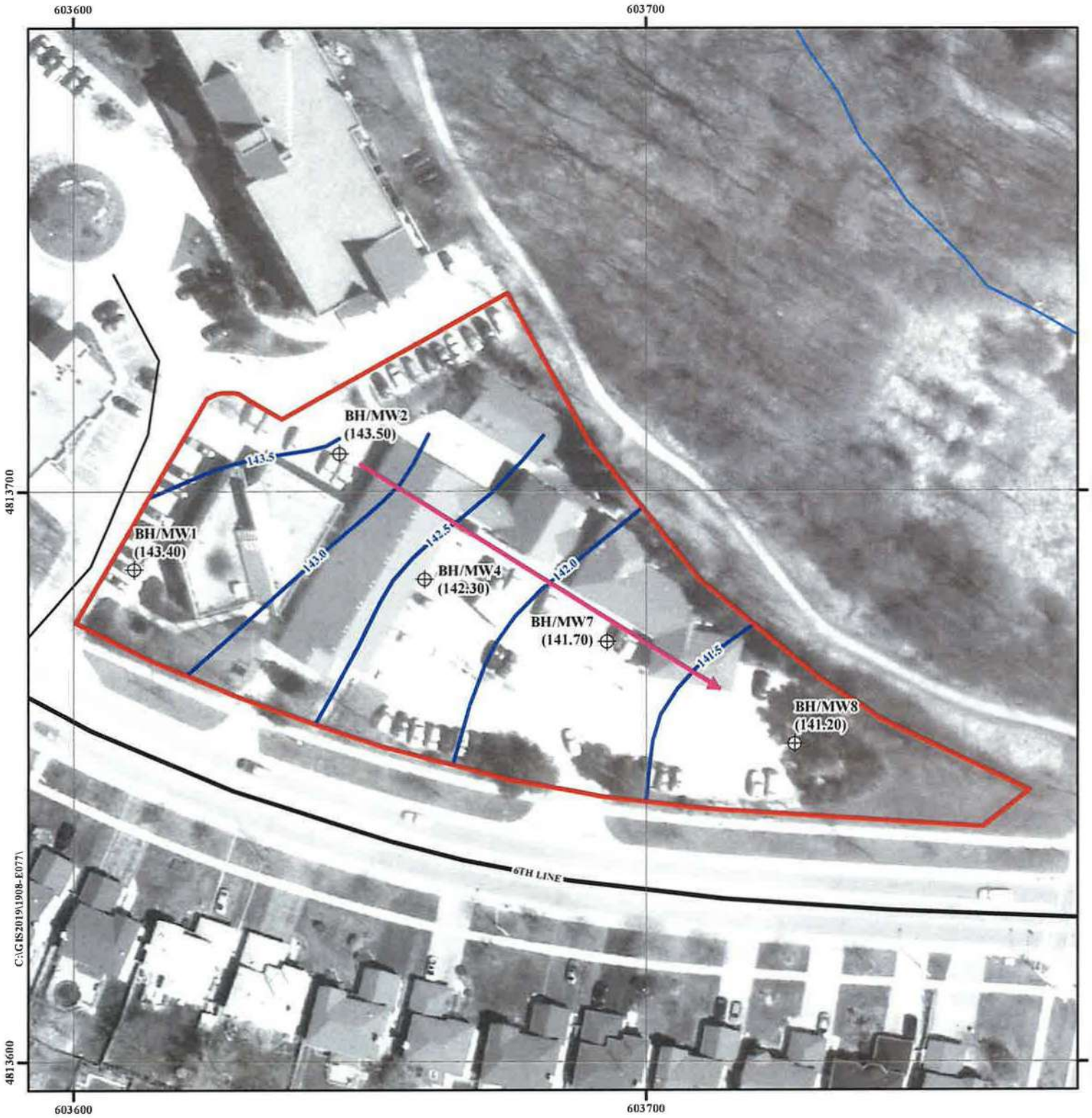
Title: Geological Cross-Sections A-A' and B-B'

Project: Proposed Mixed-Use Buildings
2163 and 2169 Sixth Line
Town of Oakville

Reference No:	Date:	Scale: V	Scale: H	Drawing No.
1908-E077	November 12, 2019	1:400	1:600	4



N

Subject Site

Borehole with Monitoring Well

Interpreted Shallow Groundwater Flow Direction

142.5 Groundwater Elevation Contour

Watercourse

Major Road

Local Road

Soil Engineers Ltd.

Title: Shallow Groundwater Contour Map

Project:
Proposed Mixed-Use Buildings
2163 and 2169 Sixth Line
Town of Oakville

Reference No. 1908-E077

Date: November 12, 2019

Scale:
0 5 10 20 30 40 50
Metres

Drawing No. 5

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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 725-1315	FAX: (905) 542-2769

APPENDIX 'A'

SAMPLING AND ANALYSIS PLAN

REFERENCE NO. 1908-E077

This Sampling and Analysis Plan is prepared for the Phase Two Environmental Site Assessment (Phase Two ESA), as defined by Ontario Regulation (O. Reg.) 153/04, as amended. The subject site is located at 2163 and 2169 Sixth Line, in the Town of Oakville (hereinafter referred to as "the subject site").

The Sampling and Analysis Plan is based on the findings of our Phase One Environmental Site Assessment (Phase One ESA, Reference No. 1908-E077, dated September 13, 2019).

1) OBJECTIVE

The objective of the Phase Two ESA is to determine the soil and groundwater quality at the subject site, as related to the following Areas of Potential Environmental Concerns (APECs), based on findings of our Phase One ESA.

APEC 1: Potential soil and groundwater impact due to the photo processing at the northwestern portion of the subject site.

APEC 2: Potential soil impact due to the fire incident at the northwestern portion of the subject site.

APEC 3: Potential soil impact due to unknown quality of fill material underneath the subject site building at the northwestern portion of the subject site.

2) SCOPE OF WORK

The scope of work for the Phase Two ESA includes:

- Conduct ten (10) boreholes to the depths ranging from 1.2 meter below existing ground surface (mbgs) to 9.1 mbgs during combined environmental, geotechnical and hydrogeological investigation.
- Collect representative soil samples from the selected boreholes.
- Undertake field examination of the retrieved soil samples for visual and olfactory evidence of potential contamination.
- Undertake soil vapour measurements for the retrieved soil samples using an organic gas detector (RKI Eagle) in methane elimination mode, calibrated with having a minimum detection level of 0.1 ppm (parts per million by volume).
- Install a monitoring well in selected boreholes for groundwater sampling testing and monitoring.
- Conduct groundwater monitoring and collect groundwater samples for chemical testing.
- Carry out analytical testing program on selected soil and groundwater samples including quality assurance/quality control (QA/QC samples) for one or more of the following parameters: petroleum hydrocarbons (PHCs), volatile organic compounds (VOCs), polycyclic aromatic hydrocarbons (PAHs), pH, and metals.
- Review the analytical results for the submitted soil and groundwater samples using the applicable Site Condition Standards.
- Prepare a Phase Two ESA report presenting the findings of the investigation.

3) RATIONALE FOR BOREHOLE AND MONITORING WELL LOCATIONS

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

Areas of Potential Environmental Concerns (APECs)	Borehole/Monitoring well ID.
APEC 1: Potential soil and groundwater impact due to the photo processing at the northwestern portion of the subject site.	BH9, MW4
APEC 2: Potential soil impact due to the fire incident at the northwestern portion of the subject site.	BH10
APEC 3: Potential soil impact due to unknown quality of fill material underneath the subject site building at the northwestern portion of the subject site.	BH9 and BH10

The location of proposed sampling locations for the Phase Two ESA is shown in Drawing No. 2.

4) SOIL AND GROIUNDWATER SAMPLES (INCLUDING QA/QC SAMPLES) ANALYTICAL SCHEDULE

A summary of soil and groundwater samples (including QA/QC samples) to be submitted is presented in the table below:

Borehole/Monitoring Well	M &/or I	PHCs	VOCs	PAHs
Soil Sample (QA/QC samples)				
BH 9	1	1	1	1
BH 10	1	1	1	1
Duplicate Soil Sample	1	-	-	
Groundwater Sample (QA/QC samples)				
MW 4	1	1	1	1
Duplicate GW Sample	-	1	-	-
Trip Blank	-	1	-	-

It should be noted that based on the analytical results of the submitted soil and groundwater samples, if further activities of Phase Two ESA such as re-sampling and testing is required, additional samples from the area of interest will be submitted for analysis of contaminants of concern.

5) SOIL AND GROUNDWATER SAMPLING PROCEDURES

Soil Engineers Ltd.'s (SEL) Standard Operation Procedures (SOPs) will be followed throughout the field investigation (sampling, decontamination of equipment, observation and documentation) including the field QA/QC program. SEL SOPs are presented in Section 7 of this sampling and analysis plan.

6) DATA QUALITY OBJECTIVES

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

- SEL SOPs, as presented in Section 7.
- The "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", May 1996, revised December 1996, as amended by O. Reg. 511/09.

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

7) STANDARD OPERATING PROCEDURES (SOPs)

7.1) Borehole Drilling

The purpose of borehole drilling is to provide access to subsurface soils at specified locations and depths. Soil borings also allow for installation of groundwater monitoring wells.

7.1.1) Underground Utilities

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

7.1.2) Drilling Methods

Direct Push Drilling (i.e. Geoprobe, Powerprobe, Pionjar, etc.)

The direct push drilling machine is a hydraulically powered hammer/ram sampling device. The unit is designed so that the weight of the vehicle provides the majority of downward force. The hydraulics, with the aid of a percussion hammer, push lengths of specially modified 54 mm (2.125 inch) outside diameter (OD), hardened steel rod into the ground. The rod is advanced to target sampling depth is reached. The steel rod has been specially modified for specific types of sample collection.

Flight-Auger Drilling

The flight-auger drilling machine is a hydraulically powered feed and retract system that provides 28,275 pounds (12,826 kg) of retract force and 18,650 pounds (8,460 kg) of down pressure. The 183 cm (72 inch) stroke, hydraulic vertical drive system has no chains or cables which can stretch. It is equipped with hollow-stem augers. It is extended to pre-determined sampling intervals using conventional drilling methods, at which time a decontaminated 51 mm

split-spoon sampler is extended ahead of the lead auger to collect a soil sample. The split-spoon sampler is then brought to surface and opened, exposing the soil core sample.

Hand Dug Test Pit

The hand-dug test pits were hand-dug using shovel. Prior to digging and sampling at each test pit location, the shovel was brushed clean using a solution of phosphate-free detergent and distilled water.

7.1.3) Occupational Health and Safety

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

7.1.4) Drilling Spoils

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

7.1.5) Borehole Abandonment

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

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

7.1.6) Subsurface Obstruction

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

7.2) **Soil Sampling**

7.2.1) Introduction

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

Drilling Rig Decontamination

Geoprobe

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

CME 55

Drilling equipment such as drill rigs, augers, drill pipes, drilling rods and split-spoons are decontaminated prior to initial use, between borehole locations and at the completion of drilling activities. The drilling equipment is manually scrubbed with a brush using a phosphate-free solution and thoroughly steam cleaned and/or power washed to remove any foreign material and potential contaminants.

In addition, the spilt-spoon sampler and any sub-sampling equipment is decontaminated prior to each usage. Various solutions are used for sampling equipment decontamination as described below:

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

7.2.2) Sample Logging and Field Screening

Samples are typically collected at 1.5 m intervals in the overburden. Tactile examination of the samples is made to classify the soil, and a log is recorded for each borehole detailing the physical characteristics of the soil including colour, soil type, structure, and any observed staining or odour. The organic vapour readings, the moisture content of the samples as determined in the laboratory, the groundwater and cave-in levels measured at the time of investigation, and the groundwater monitoring well construction details are given on the borehole logs.

7.2.3) Field Screening and Calibration Procedures

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

The organic vapour readings are measured using a portable RKI Eagle gas detector, TYPE 101 (Serial Number: E091015) set to include all gases, and having a minimum detection of 2 ppm. Prior to measurement, the detector is calibrated using a Hexane 40% LEL gas. The allowable range of calibration is 38% to 42%.

7.2.4) Soil Sampling

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

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

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

i. Field Duplicates: At least 1 field duplicate sample is collected and submitted for laboratory analysis for every 10 soil samples that are collected to ensure the soil sampling technique is accurate.

7.3) **Well Installation**

7.3.1) Introduction

The well installation procedures are described herein.

7.3.2) Screen and Riser Pipe

Monitoring wells are constructed from individually wrapped 38 or 50 mm inside diameter (ID) schedule 40 polyvinyl chloride (PVC) flush threaded casing equipped with O-rings. The screen consists of casing material which is factory slotted (slot width = 0.25 mm) to permit the entry of water into the well. The bottom of the screens are equipped with threaded end caps. The appropriate number of risers are coupled with the screen section(s) via threaded joints to construct the well. The top of the wells are tightly capped using a locking well cap, which prevents the infiltration of surface water and foreign material into the well and also provides security. A watertight, traffic-rated protective casing is installed over each monitoring well within a concrete pad extending approximately 0.5 mbgs. No PVC cements or other solvent based cements are used in the construction of the monitoring wells.

7.3.3) Well Materials Decontamination

Dedicated sampling equipment, such as submersible pumps, are decontaminated prior to installation inside monitoring wells.

Where factory-cleaned, hermetically sealed materials are used, no decontamination is conducted.

Setting Screen, Riser Casings and Filter Materials

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

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

Setting Seals and Grouting

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

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

Capping the Wells

For above-ground completions, the protective steel casing will be centered on the well casing and inserted into the grouted annulus. Prior to installation, a 2-inch deep temporary spacer may be placed between the PVC well cap and the bottom of the protective casing cover to keep the protective casing from settling onto the well cap. A minimum of 24 hours after grouting should elapse before installation of the concrete pad and steel guard posts for above-ground completions, or street boxes or vaults for flush mount completions. For above-ground completions, a concrete pad, usually 3-foot by 3-foot by 4-inch thick, is constructed at ground surface around the protective steel casing. The concrete is sloped away from the protective casing to promote surface drainage from the well.

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

7.3.4) Documentation of Monitoring Well Configuration

The following information is recorded:

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

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APPENDIX 'B'

BOREHOLE LOGS

REFERENCE NO. 1908-E077

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 3, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
148.60	Pavement Surface							
0.0	**10 cm ASPHALT** **33 cm GRANULAR FILL**	1	DO		0			
148.0 0.6	**GRANULAR FILL**	2	DO		1			
	weathered Reddish brown, stiff to hard							
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	3	DO		2			
		4	DO					
145.4 3.2	Reddish brown, hard	5	DO		3			
	WEATHERED SHALE				4			
		6	DO		5			
		7	AS		6			
					7			
					8			
139.5 9.1	END OF BOREHOLE Installed 51 mm standpipe to 9.1 m. Bentonite seal from 0.3 to 5.49 m. Sand backfill from 5.49 to 9.1 m. 3.05 m screen from 6.05 to 9.1 m. Provided with flushmount protective casing.				9			W.L @ 5.20 mbgs on October 10, 2019
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 10, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading
148.60	Pavement Surface			
0.0	**10 cm ASPHALT**			
	30 cm GRANULAR FILL	1	DO	
148.0 / 0.6	**GRANULAR FILL**	2	DO	
	Reddish brown, very stiff to hard			
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	3	DO	
		4	DO	
145.3 / 3.3	Reddish brown, hard	5	DO	
	WEATHERED SHALE	6	AS	
		7	AS	
139.5 / 9.1	END OF BOREHOLE Installed 51 mm standpipe to 9.1 m. Bentonite seal from 0.3 to 5.49 m. Sand backfill from 5.49 to 9.1 m. 3.05 m screen from 6.05 to 9.1 m. Provided with flushmount protective casing.			

Depth Scale (mbgs): 0 1 2 3 4 5 6 7 8 9 10 11

● Gas Reading (ppm): 20 60 100 140 180

REMARKS

WATER LEVEL: W.L @ 5.10 mbgs on October 10, 2019

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 4, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
147.50	Pavement Surface							
0.0	**8 cm TOPSOIL**				0			
	Reddish brown, stiff to hard — weathered	1	DO					
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	2	DO		1			
		3	DO		2			
		4	DO					
144.5					3			
3.0	Reddish brown to grey, hard	5	DO					
	WEATHERED SHALE occ. limestone layers				4			
		6	AS		5			Dry on completion
141.4		7	AS		6			
6.1	END OF BOREHOLE				7			
					8			
					9			
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 10, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	SAMPLES Type	SAMPLES Gas Reading	Depth Scale (mbgs)	Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
147.50	Pavement Surface							
0.0	**8 cm ASPHALT**				0			
	23 cm GRANULAR FILL	1	DO					
	Reddish brown, stiff to very stiff — weathered							
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	2	DO		1			
		3	DO		2			
145.2								
2.3	Reddish brown, hard	4	DO					
	WEATHERED SHALE occ. limestone layers	5	DO		3			
					4			
		6	AS		5			
141.4		7	AS		6			
6.1	END OF BOREHOLE Installed 51 mm standpipe to 6.1 m. Bentonite seal from 0.3 to 2.5 m. Sand backfill from 2.5 to 6.1 m. 3 m screen from 3.1 to 6.1 m. Provided with flushmount protective casing.				7			W.L @ 5.20 mbgs on October 10, 2019
					8			
					9			
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 4, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
146.80	Pavement Surface							
0.0	**13 cm ASPHALT** **25 cm GRANULAR FILL**	1	DO		0			Dry on completion
	Reddish brown, very stiff **SILTY CLAY TILL** a trace of gravel — weathered occ. sand seams and layers, cobbles and boulders	2	DO		1			
		3	DO		2			
144.5 2.3	Reddish brown, hard **WEATHERED SHALE**	4	DO					
		5	DO		3			
					4			
		6	AS		5			
140.7 6.1	END OF BOREHOLE	7	AS		6			
					7			
					8			
					9			
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 4, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
148.40	Pavement Surface							
0.0	**13 cm TOPSOIL**	1	DO		0			Dry on completion
	Reddish brown, firm to very stiff weathered							
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	2	DO		1			
		3	DO		2			
146.1								
2.3	Reddish brown, hard	4	DO					
	WEATHERED SHALE	5	DO		3			
					4			
		6	AS		5			
142.3		7	AS		6			
6.1	END OF BOREHOLE				7			
					8			
					9			
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 7, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
147.00	Pavement Surface							
	8 cm ASPHALT	1A	DO		0			
	20 cm GRANULAR FILL	1B						
	Reddish brown, firm to hard — weathered							
	SILTY CLAY TILL a trace of gravel occ. sand seams and layers, cobbles and boulders	2	DO		1			
		3	DO		2			
144.7 2.3	Reddish brown, hard	4	DO					
	WEATHERED SHALE	5	DO		3			
					4			
		6	AS		5			
		7	AS		6			
					7			
					8			
138.3 8.7	END OF BOREHOLE Installed 51 mm standpipe to 8.99 m. Bentonite seal from 0.3 to 5.33 m. Sand backfill from 5.33 to 8.99 m. 3.05 m screen from 5.94 to 8.99 m. Provided with flushmount protective casing.				9			W.L @ 5.30 mbgs on October 10, 2019
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Flight-Auger

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 9, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
146.90	Pavement Surface							
0.0	**8 cm ASPHALT** **25 cm GRANULAR FILL**	1	DO	0	0			
146.3 0.6	**GRANULAR FILL**	2	DO	0	1			
	Reddish brown, very stiff to hard **SILTY CLAY TILL** a trace of gravel occ. sand seams and layers, cobbles and boulders	3	DO	0	2			
		4	DO	0				
143.9 3.0	Reddish brown, hard **WEATHERED SHALE**	5	DO	0	3			
		6	AS	0	4			
		7	AS	0	5			
					6			
					7			
					8			
					9			
137.5 9.4	END OF BOREHOLE Installed 51 mm standpipe to 9.1 m. Bentonite seal from 0.30 to 5.49 m. Sand backfill from 5.49 to 9.1 m. 3.05 m screen from 6.05 to 9.1 m. Provided with flushmount protective casing.				10			W.L @ 5.70 mbgs on October 10, 2019
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Direct Push

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 7, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
148.60	Concrete Surface							
0.0	**13 cm CONCRETE** **20 cm GRANULAR FILL** Brown, dry	1	TO	0	0	●	BH9/1: Metals	
147.7 0.9	**SAND FILL** with pebbles Dry, wet	2	TO	0.1	1	●	BH9/2: PAH, PHC, VOC	
147.1 1.5	**SILTY CLAY TILL** with shale END OF BOREHOLE				2			
					3			
					4			
					5			
					6			
					7			
					8			
					9			
					10			
					11			

Soil Engineers Ltd.

JOB NO.: 1908-E077

LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Proposed Mixed-Use Buildings

METHOD OF BORING: Direct Push

PROJECT LOCATION: 2163 and 2169 Sixth Line, Town of Oakville

DRILLING DATE: October 7, 2019

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES: Number	SAMPLES: Type	SAMPLES: Gas Reading	Depth Scale (mbgs)	● Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
148.60	Concrete Surface							
0.0	**9 cm CONCRETE**				0			
	Red, dry **SANDY SILT FILL** trace of gravel	1	TO	0.1		●	BH10/1: Metals	
147.7 0.9					1			
	SILTY CLAY TILL	2	TO	0		●	BH10/2: PAH, PHC, VOC	
147.1 1.5	END OF BOREHOLE				2			
					3			
					4			
					5			
					6			
					7			
					8			
					9			
					10			
					11			

Soil Engineers Ltd.
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FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 725-1315	FAX: (905) 542-2769

APPENDIX 'C'

CERTIFICATE OF ANALYSIS

(SOIL SAMPLES)

REFERENCE NO. 1908-E077

Your Project #: 1908-E077
Your C.O.C. #: 741296-02-01

Attention: Laila Torabansari

Soil Engineers Ltd
90 West Beaver Creek Road
Unit 100
Richmond Hill, ON
CANADA L4B 1E7

Report Date: 2019/10/16
Report #: R5923712
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S2959
Received: 2019/10/08, 15:41

Sample Matrix: Soil
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	2	N/A	2019/10/16	CAM SOP-00301	EPA 8270D m
Hot Water Extractable Boron	2	2019/10/10	2019/10/11	CAM SOP-00408	R153 Ana. Prot. 2011
1,3-Dichloropropene Sum	2	N/A	2019/10/11		EPA 8260C m
Free (WAD) Cyanide	2	2019/10/09	2019/10/10	CAM SOP-00457	OMOE E3015 m
Hexavalent Chromium in Soil by IC (1)	2	2019/10/09	2019/10/11	CAM SOP-00436	EPA 3060/7199 m
Petroleum Hydrocarbons F2-F4 in Soil (2)	2	2019/10/11	2019/10/12	CAM SOP-00316	CCME CWS m
Strong Acid Leachable Metals by ICPMS	3	2019/10/10	2019/10/11	CAM SOP-00447	EPA 6020B m
Moisture	4	N/A	2019/10/09	CAM SOP-00445	Carter 2nd ed 51.2 m
PAH Compounds in Soil by GC/MS (SIM)	1	2019/10/11	2019/10/11	CAM SOP-00318	EPA 8270D m
PAH Compounds in Soil by GC/MS (SIM)	1	2019/10/11	2019/10/12	CAM SOP-00318	EPA 8270D m
pH CaCl2 EXTRACT	1	2019/10/10	2019/10/10	CAM SOP-00413	EPA 9045 D m
Volatile Organic Compounds and F1 PHCs	2	N/A	2019/10/10	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Bureau Veritas Laboratories 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Your Project #: 1908-E077
Your C.O.C. #: 741296-02-01

Attention: Laila Torabansari

Soil Engineers Ltd
90 West Beaver Creek Road
Unit 100
Richmond Hill, ON
CANADA L4B 1E7

Report Date: 2019/10/16
Report #: R5923712
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9S2959

Received: 2019/10/08, 15:41

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Soils are reported on a dry weight basis unless otherwise specified.

(2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

AUTHORIZED REPORT
RAPPORT AUTORISÉ

Bureau Veritas Laboratories
16 Oct 2019 17:51:05

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: Antonella.Brasil@bvlabs.com
Phone# (905)817-5817

This report has been generated and distributed using a secure automated process.
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

O.REG 153 ICPMS METALS (SOIL)

BV Labs ID		KZK054		
Sampling Date		2019/10/07		
COC Number		741296-02-01		
	UNITS	DUP 1	RDL	QC Batch
Metals				
Acid Extractable Antimony (Sb)	ug/g	0.33	0.20	6380263
Acid Extractable Arsenic (As)	ug/g	4.9	1.0	6380263
Acid Extractable Barium (Ba)	ug/g	130	0.50	6380263
Acid Extractable Beryllium (Be)	ug/g	0.72	0.20	6380263
Acid Extractable Boron (B)	ug/g	14	5.0	6380263
Acid Extractable Cadmium (Cd)	ug/g	0.11	0.10	6380263
Acid Extractable Chromium (Cr)	ug/g	21	1.0	6380263
Acid Extractable Cobalt (Co)	ug/g	15	0.10	6380263
Acid Extractable Copper (Cu)	ug/g	17	0.50	6380263
Acid Extractable Lead (Pb)	ug/g	9.7	1.0	6380263
Acid Extractable Molybdenum (Mo)	ug/g	0.65	0.50	6380263
Acid Extractable Nickel (Ni)	ug/g	27	0.50	6380263
Acid Extractable Selenium (Se)	ug/g	<0.50	0.50	6380263
Acid Extractable Silver (Ag)	ug/g	<0.20	0.20	6380263
Acid Extractable Thallium (Tl)	ug/g	0.11	0.050	6380263
Acid Extractable Uranium (U)	ug/g	0.58	0.050	6380263
Acid Extractable Vanadium (V)	ug/g	28	5.0	6380263
Acid Extractable Zinc (Zn)	ug/g	55	5.0	6380263
Acid Extractable Mercury (Hg)	ug/g	<0.050	0.050	6380263

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 METALS PACKAGE (SOIL)

BV Labs ID		KZK050	KZK052			KZK052		
Sampling Date		2019/10/07 08:10	2019/10/07 10:00			2019/10/07 10:00		
COC Number		741296-02-01	741296-02-01			741296-02-01		
	UNITS	BH9/1	BH10/1	RDL	QC Batch	BH10/1 Lab-Dup	RDL	QC Batch
Inorganics								
Moisture	%	11	11	1.0	6379114			
Chromium (VI)	ug/g	<0.2	<0.2	0.2	6378799			
Metals								
Hot Water Ext. Boron (B)	ug/g	0.092	0.072	0.050	6380609	0.071	0.050	6380609
Acid Extractable Antimony (Sb)	ug/g	0.25	0.33	0.20	6380563			
Acid Extractable Arsenic (As)	ug/g	4.5	5.5	1.0	6380563			
Acid Extractable Barium (Ba)	ug/g	150	120	0.50	6380563			
Acid Extractable Beryllium (Be)	ug/g	0.62	0.76	0.20	6380563			
Acid Extractable Boron (B)	ug/g	17	17	5.0	6380563			
Acid Extractable Cadmium (Cd)	ug/g	0.20	0.14	0.10	6380563			
Acid Extractable Chromium (Cr)	ug/g	19	22	1.0	6380563			
Acid Extractable Cobalt (Co)	ug/g	11	13	0.10	6380563			
Acid Extractable Copper (Cu)	ug/g	16	18	0.50	6380563			
Acid Extractable Lead (Pb)	ug/g	11	10	1.0	6380563			
Acid Extractable Molybdenum (Mo)	ug/g	1.0	0.58	0.50	6380563			
Acid Extractable Nickel (Ni)	ug/g	24	28	0.50	6380563			
Acid Extractable Selenium (Se)	ug/g	<0.50	<0.50	0.50	6380563			
Acid Extractable Silver (Ag)	ug/g	<0.20	<0.20	0.20	6380563			
Acid Extractable Thallium (Tl)	ug/g	0.10	0.11	0.050	6380563			
Acid Extractable Uranium (U)	ug/g	0.60	0.59	0.050	6380563			
Acid Extractable Vanadium (V)	ug/g	26	31	5.0	6380563			
Acid Extractable Zinc (Zn)	ug/g	79	59	5.0	6380563			
Acid Extractable Mercury (Hg)	ug/g	<0.050	<0.050	0.050	6380563			

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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O.REG 153 PAHS (SOIL)

BV Labs ID		KZK051			KZK051			KZK053		
Sampling Date		2019/10/07 08:40			2019/10/07 08:40			2019/10/07 10:40		
COC Number		741296-02-01			741296-02-01			741296-02-01		
	UNITS	BH9/2	RDL	QC Batch	BH9/2 Lab-Dup	RDL	QC Batch	BH10/2	RDL	QC Batch
Calculated Parameters										
Methylnaphthalene, 2-(1-)	ug/g	<0.0071	0.0071	6377511				<0.0071	0.0071	6377511
Polyaromatic Hydrocarbons										
Acenaphthene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Acenaphthylene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Anthracene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Benzo(a)anthracene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Benzo(a)pyrene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Benzo(b/j)fluoranthene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Benzo(g,h,i)perylene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Benzo(k)fluoranthene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Chrysene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Dibenz(a,h)anthracene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Fluoranthene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Fluorene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Indeno(1,2,3-cd)pyrene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
1-Methylnaphthalene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
2-Methylnaphthalene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Naphthalene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Phenanthrene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Pyrene	ug/g	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354	<0.0050	0.0050	6382354
Surrogate Recovery (%)										
D10-Anthracene	%	87		6382354	91		6382354	89		6382354
D14-Terphenyl (FS)	%	92		6382354	97		6382354	90		6382354
D8-Acenaphthylene	%	82		6382354	87		6382354	87		6382354

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

BV Labs ID		KZK051			KZK051			KZK053		
Sampling Date		2019/10/07 08:40			2019/10/07 08:40			2019/10/07 10:40		
COC Number		741296-02-01			741296-02-01			741296-02-01		
	UNITS	BH9/2	RDL	QC Batch	BH9/2 Lab-Dup	RDL	QC Batch	BH10/2	RDL	QC Batch
Inorganics										
Moisture	%	11	1.0	6378601				11	1.0	6378601
Calculated Parameters										
1,3-Dichloropropene (cis+trans)	ug/g	<0.050	0.050	6377857				<0.050	0.050	6377857
Volatile Organics										
Acetone (2-Propanone)	ug/g	<0.50	0.50	6378541				<0.50	0.50	6378541
Benzene	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
Bromodichloromethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Bromoform	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Bromomethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Carbon Tetrachloride	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Chlorobenzene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Chloroform	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Dibromochloromethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,2-Dichlorobenzene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,3-Dichlorobenzene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,4-Dichlorobenzene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Dichlorodifluoromethane (FREON 12)	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,1-Dichloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,2-Dichloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,1-Dichloroethylene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
cis-1,2-Dichloroethylene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
trans-1,2-Dichloroethylene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,2-Dichloropropane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
cis-1,3-Dichloropropene	ug/g	<0.030	0.030	6378541				<0.030	0.030	6378541
trans-1,3-Dichloropropene	ug/g	<0.040	0.040	6378541				<0.040	0.040	6378541
Ethylbenzene	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
Ethylene Dibromide	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Hexane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Methylene Chloride(Dichloromethane)	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Methyl Ethyl Ketone (2-Butanone)	ug/g	<0.50	0.50	6378541				<0.50	0.50	6378541
Methyl Isobutyl Ketone	ug/g	<0.50	0.50	6378541				<0.50	0.50	6378541
Methyl t-butyl ether (MTBE)	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Styrene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,1,1,2-Tetrachloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

O.REG 153 VOCS BY HS & F1-F4 (SOIL)

BV Labs ID		KZK051			KZK051			KZK053		
Sampling Date		2019/10/07 08:40			2019/10/07 08:40			2019/10/07 10:40		
COC Number		741296-02-01			741296-02-01			741296-02-01		
	UNITS	BH9/2	RDL	QC Batch	BH9/2 Lab-Dup	RDL	QC Batch	BH10/2	RDL	QC Batch
1,1,2,2-Tetrachloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Tetrachloroethylene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Toluene	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
1,1,1-Trichloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
1,1,2-Trichloroethane	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Trichloroethylene	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Trichlorofluoromethane (FREON 11)	ug/g	<0.050	0.050	6378541				<0.050	0.050	6378541
Vinyl Chloride	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
p+m-Xylene	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
o-Xylene	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
Total Xylenes	ug/g	<0.020	0.020	6378541				<0.020	0.020	6378541
F1 (C6-C10)	ug/g	<10	10	6378541				<10	10	6378541
F1 (C6-C10) - BTEX	ug/g	<10	10	6378541				<10	10	6378541
F2-F4 Hydrocarbons										
F2 (C10-C16 Hydrocarbons)	ug/g	<10	10	6382349	<10	10	6382349	<10	10	6382349
F3 (C16-C34 Hydrocarbons)	ug/g	<50	50	6382349	<50	50	6382349	<50	50	6382349
F4 (C34-C50 Hydrocarbons)	ug/g	<50	50	6382349	<50	50	6382349	<50	50	6382349
Reached Baseline at C50	ug/g	Yes		6382349	Yes		6382349	Yes		6382349
Surrogate Recovery (%)										
o-Terphenyl	%	94		6382349	97		6382349	90		6382349
4-Bromofluorobenzene	%	89		6378541				90		6378541
D10-o-Xylene	%	85		6378541				85		6378541
D4-1,2-Dichloroethane	%	114		6378541				116		6378541
D8-Toluene	%	94		6378541				93		6378541

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

BV Labs Job #: B9S2959
Report Date: 2019/10/16

Soil Engineers Ltd
Client Project #: 1908-E077
Sampler Initials: LT

RESULTS OF ANALYSES OF SOIL

BV Labs ID		KZK050		KZK052		
Sampling Date		2019/10/07 08:10		2019/10/07 10:00		
COC Number		741296-02-01		741296-02-01		
	UNITS	BH9/1	QC Batch	BH10/1	RDL	QC Batch
Inorganics						
Available (CaCl2) pH	pH	8.08	6380099			
WAD Cyanide (Free)	ug/g	<0.01	6378849	<0.01	0.01	6378849

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: KZK050
Sample ID: BH9/1
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6380609	2019/10/10	2019/10/11	Jolly John
Free (WAD) Cyanide	TECH	6378849	2019/10/09	2019/10/10	Louise Harding
Hexavalent Chromium in Soil by IC	IC/SPEC	6378799	2019/10/09	2019/10/11	Sally Norouz Coughlin
Strong Acid Leachable Metals by ICPMS	ICP/MS	6380563	2019/10/10	2019/10/11	Viviana Canzonieri
Moisture	BAL	6379114	N/A	2019/10/09	Gurpreet Kaur
pH CaCl2 EXTRACT	AT	6380099	2019/10/10	2019/10/10	Surinder Rai

BV Labs ID: KZK051
Sample ID: BH9/2
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6377511	N/A	2019/10/16	Automated Statchk
1,3-Dichloropropene Sum	CALC	6377857	N/A	2019/10/11	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6382349	2019/10/11	2019/10/12	Prabhjot Gulati
Moisture	BAL	6378601	N/A	2019/10/09	Gurpreet Kaur
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6382354	2019/10/11	2019/10/11	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6378541	N/A	2019/10/10	Blair Gannon

BV Labs ID: KZK051 Dup
Sample ID: BH9/2
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6382349	2019/10/11	2019/10/12	Prabhjot Gulati
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6382354	2019/10/11	2019/10/11	Mitesh Raj

BV Labs ID: KZK052
Sample ID: BH10/1
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6380609	2019/10/10	2019/10/11	Jolly John
Free (WAD) Cyanide	TECH	6378849	2019/10/09	2019/10/10	Louise Harding
Hexavalent Chromium in Soil by IC	IC/SPEC	6378799	2019/10/09	2019/10/11	Sally Norouz Coughlin
Strong Acid Leachable Metals by ICPMS	ICP/MS	6380563	2019/10/10	2019/10/11	Viviana Canzonieri
Moisture	BAL	6379114	N/A	2019/10/09	Gurpreet Kaur

BV Labs ID: KZK052 Dup
Sample ID: BH10/1
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hot Water Extractable Boron	ICP	6380609	2019/10/10	2019/10/11	Jolly John

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BV Labs Job #: B9S2959
Report Date: 2019/10/16

Soil Engineers Ltd
Client Project #: 1908-E077
Sampler Initials: LT

TEST SUMMARY

BV Labs ID: KZK053
Sample ID: BH10/2
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6377511	N/A	2019/10/16	Automated Statchk
1,3-Dichloropropene Sum	CALC	6377857	N/A	2019/10/11	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Soil	GC/FID	6382349	2019/10/11	2019/10/12	Prabhjot Gulati
Moisture	BAL	6378601	N/A	2019/10/09	Gurpreet Kaur
PAH Compounds in Soil by GC/MS (SIM)	GC/MS	6382354	2019/10/11	2019/10/12	Mitesh Raj
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6378541	N/A	2019/10/10	Blair Gannon

BV Labs ID: KZK054
Sample ID: DUP 1
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/08

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Strong Acid Leachable Metals by ICPMS	ICP/MS	6380263	2019/10/10	2019/10/11	Viviana Canzonieri

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	6.0°C

Results relate only to the items tested.

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BV Labs Job #: B9S2959
Report Date: 2019/10/16

QUALITY ASSURANCE REPORT

Soil Engineers Ltd
Client Project #: 1908-E077
Sampler Initials: LT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6378541	4-Bromofluorobenzene	2019/10/10	98	60 - 140	99	60 - 140	90	%		
6378541	D10-o-Xylene	2019/10/10	89	60 - 130	95	60 - 130	83	%		
6378541	D4-1,2-Dichloroethane	2019/10/10	111	60 - 140	106	60 - 140	111	%		
6378541	D8-Toluene	2019/10/10	105	60 - 140	106	60 - 140	94	%		
6382349	o-Terphenyl	2019/10/11	92	60 - 130	96	60 - 130	93	%		
6382354	D10-Anthracene	2019/10/11	90	50 - 130	93	50 - 130	91	%		
6382354	D14-Terphenyl (FS)	2019/10/11	93	50 - 130	94	50 - 130	92	%		
6382354	D8-Acenaphthylene	2019/10/11	86	50 - 130	91	50 - 130	87	%		
6378541	1,1,1,2-Tetrachloroethane	2019/10/10	104	60 - 140	103	60 - 130	<0.050	ug/g	NC	50
6378541	1,1,1-Trichloroethane	2019/10/10	107	60 - 140	106	60 - 130	<0.050	ug/g	NC	50
6378541	1,1,2,2-Tetrachloroethane	2019/10/10	97	60 - 140	92	60 - 130	<0.050	ug/g	NC	50
6378541	1,1,2-Trichloroethane	2019/10/10	110	60 - 140	106	60 - 130	<0.050	ug/g	NC	50
6378541	1,1-Dichloroethane	2019/10/10	102	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
6378541	1,1-Dichloroethylene	2019/10/10	104	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
6378541	1,2-Dichlorobenzene	2019/10/10	96	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
6378541	1,2-Dichloroethane	2019/10/10	109	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
6378541	1,2-Dichloropropane	2019/10/10	99	60 - 140	95	60 - 130	<0.050	ug/g	NC	50
6378541	1,3-Dichlorobenzene	2019/10/10	97	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
6378541	1,4-Dichlorobenzene	2019/10/10	96	60 - 140	100	60 - 130	<0.050	ug/g	NC	50
6378541	Acetone (2-Propanone)	2019/10/10	103	60 - 140	92	60 - 140	<0.50	ug/g	NC	50
6378541	Benzene	2019/10/10	97	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
6378541	Bromodichloromethane	2019/10/10	102	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
6378541	Bromoform	2019/10/10	99	60 - 140	94	60 - 130	<0.050	ug/g	NC	50
6378541	Bromomethane	2019/10/10	101	60 - 140	98	60 - 140	<0.050	ug/g	NC	50
6378541	Carbon Tetrachloride	2019/10/10	109	60 - 140	110	60 - 130	<0.050	ug/g	NC	50
6378541	Chlorobenzene	2019/10/10	98	60 - 140	98	60 - 130	<0.050	ug/g	NC	50
6378541	Chloroform	2019/10/10	104	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
6378541	cis-1,2-Dichloroethylene	2019/10/10	101	60 - 140	99	60 - 130	<0.050	ug/g	NC	50
6378541	cis-1,3-Dichloropropene	2019/10/10	83	60 - 140	80	60 - 130	<0.030	ug/g	NC	50
6378541	Dibromochloromethane	2019/10/10	101	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
6378541	Dichlorodifluoromethane (FREON 12)	2019/10/10	99	60 - 140	98	60 - 140	<0.050	ug/g	NC	50

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6378541	Ethylbenzene	2019/10/10	91	60 - 140	93	60 - 130	<0.020	ug/g	NC	50
6378541	Ethylene Dibromide	2019/10/10	102	60 - 140	97	60 - 130	<0.050	ug/g	NC	50
6378541	F1 (C6-C10) - BTEX	2019/10/10					<10	ug/g	NC	30
6378541	F1 (C6-C10)	2019/10/10	90	60 - 140	93	80 - 120	<10	ug/g	NC	30
6378541	Hexane	2019/10/10	100	60 - 140	101	60 - 130	<0.050	ug/g	NC	50
6378541	Methyl Ethyl Ketone (2-Butanone)	2019/10/10	102	60 - 140	91	60 - 140	<0.50	ug/g	NC	50
6378541	Methyl Isobutyl Ketone	2019/10/10	99	60 - 140	92	60 - 130	<0.50	ug/g	NC	50
6378541	Methyl t-butyl ether (MTBE)	2019/10/10	95	60 - 140	91	60 - 130	<0.050	ug/g	NC	50
6378541	Methylene Chloride(Dichloromethane)	2019/10/10	107	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
6378541	o-Xylene	2019/10/10	91	60 - 140	92	60 - 130	<0.020	ug/g	NC	50
6378541	p+m-Xylene	2019/10/10	91	60 - 140	93	60 - 130	<0.020	ug/g	NC	50
6378541	Styrene	2019/10/10	74	60 - 140	75	60 - 130	<0.050	ug/g	NC	50
6378541	Tetrachloroethylene	2019/10/10	100	60 - 140	104	60 - 130	<0.050	ug/g	NC	50
6378541	Toluene	2019/10/10	96	60 - 140	96	60 - 130	<0.020	ug/g	NC	50
6378541	Total Xylenes	2019/10/10					<0.020	ug/g	NC	50
6378541	trans-1,2-Dichloroethylene	2019/10/10	100	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
6378541	trans-1,3-Dichloropropene	2019/10/10	85	60 - 140	80	60 - 130	<0.040	ug/g	NC	50
6378541	Trichloroethylene	2019/10/10	100	60 - 140	102	60 - 130	<0.050	ug/g	NC	50
6378541	Trichlorofluoromethane (FREON 11)	2019/10/10	116	60 - 140	116	60 - 130	<0.050	ug/g	NC	50
6378541	Vinyl Chloride	2019/10/10	110	60 - 140	108	60 - 130	<0.020	ug/g	NC	50
6378601	Moisture	2019/10/09							1.2	20
6378799	Chromium (VI)	2019/10/11	89	70 - 130	95	80 - 120	<0.2	ug/g	NC	35
6378849	WAD Cyanide (Free)	2019/10/10	94	75 - 125	96	80 - 120	<0.01	ug/g	NC	35
6379114	Moisture	2019/10/09							12	20
6380099	Available (CaCl2) pH	2019/10/10			100	97 - 103			0.55	N/A
6380263	Acid Extractable Antimony (Sb)	2019/10/11	80	75 - 125	103	80 - 120	<0.20	ug/g	15	30
6380263	Acid Extractable Arsenic (As)	2019/10/11	93	75 - 125	105	80 - 120	<1.0	ug/g	0.13	30
6380263	Acid Extractable Barium (Ba)	2019/10/11	NC	75 - 125	98	80 - 120	<0.50	ug/g	3.2	30
6380263	Acid Extractable Beryllium (Be)	2019/10/11	93	75 - 125	100	80 - 120	<0.20	ug/g	4.0	30
6380263	Acid Extractable Boron (B)	2019/10/11	90	75 - 125	103	80 - 120	<5.0	ug/g	5.6	30
6380263	Acid Extractable Cadmium (Cd)	2019/10/11	94	75 - 125	100	80 - 120	<0.10	ug/g	13	30

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6380263	Acid Extractable Chromium (Cr)	2019/10/11	94	75 - 125	105	80 - 120	<1.0	ug/g	5.7	30
6380263	Acid Extractable Cobalt (Co)	2019/10/11	90	75 - 125	105	80 - 120	<0.10	ug/g	2.4	30
6380263	Acid Extractable Copper (Cu)	2019/10/11	NC	75 - 125	104	80 - 120	<0.50	ug/g	1.7	30
6380263	Acid Extractable Lead (Pb)	2019/10/11	NC	75 - 125	104	80 - 120	<1.0	ug/g	1.2	30
6380263	Acid Extractable Mercury (Hg)	2019/10/11	86	75 - 125	95	80 - 120	<0.050	ug/g		
6380263	Acid Extractable Molybdenum (Mo)	2019/10/11	95	75 - 125	101	80 - 120	<0.50	ug/g	3.1	30
6380263	Acid Extractable Nickel (Ni)	2019/10/11	85	75 - 125	104	80 - 120	<0.50	ug/g	2.5	30
6380263	Acid Extractable Selenium (Se)	2019/10/11	94	75 - 125	102	80 - 120	<0.50	ug/g	2.9	30
6380263	Acid Extractable Silver (Ag)	2019/10/11	94	75 - 125	101	80 - 120	<0.20	ug/g	NC	30
6380263	Acid Extractable Thallium (Tl)	2019/10/11	94	75 - 125	105	80 - 120	<0.050	ug/g	15	30
6380263	Acid Extractable Uranium (U)	2019/10/11	94	75 - 125	102	80 - 120	<0.050	ug/g	0.82	30
6380263	Acid Extractable Vanadium (V)	2019/10/11	NC	75 - 125	105	80 - 120	<5.0	ug/g	0.96	30
6380263	Acid Extractable Zinc (Zn)	2019/10/11	NC	75 - 125	104	80 - 120	<5.0	ug/g	1.4	30
6380563	Acid Extractable Antimony (Sb)	2019/10/11	106	75 - 125	100	80 - 120	<0.20	ug/g	NC	30
6380563	Acid Extractable Arsenic (As)	2019/10/11	110	75 - 125	102	80 - 120	<1.0	ug/g	0.40	30
6380563	Acid Extractable Barium (Ba)	2019/10/11	112	75 - 125	103	80 - 120	<0.50	ug/g	6.2	30
6380563	Acid Extractable Beryllium (Be)	2019/10/11	106	75 - 125	99	80 - 120	<0.20	ug/g	0.68	30
6380563	Acid Extractable Boron (B)	2019/10/11	108	75 - 125	105	80 - 120	<5.0	ug/g	1.5	30
6380563	Acid Extractable Cadmium (Cd)	2019/10/11	105	75 - 125	103	80 - 120	<0.10	ug/g	NC	30
6380563	Acid Extractable Chromium (Cr)	2019/10/11	110	75 - 125	102	80 - 120	<1.0	ug/g	2.8	30
6380563	Acid Extractable Cobalt (Co)	2019/10/11	108	75 - 125	102	80 - 120	<0.10	ug/g	4.1	30
6380563	Acid Extractable Copper (Cu)	2019/10/11	109	75 - 125	104	80 - 120	<0.50	ug/g	1.4	30
6380563	Acid Extractable Lead (Pb)	2019/10/11	104	75 - 125	104	80 - 120	<1.0	ug/g	3.1	30
6380563	Acid Extractable Mercury (Hg)	2019/10/11	93	75 - 125	92	80 - 120	<0.050	ug/g	NC	30
6380563	Acid Extractable Molybdenum (Mo)	2019/10/11	110	75 - 125	104	80 - 120	<0.50	ug/g	NC	30
6380563	Acid Extractable Nickel (Ni)	2019/10/11	111	75 - 125	103	80 - 120	<0.50	ug/g	2.4	30
6380563	Acid Extractable Selenium (Se)	2019/10/11	110	75 - 125	103	80 - 120	<0.50	ug/g	NC	30
6380563	Acid Extractable Silver (Ag)	2019/10/11	107	75 - 125	103	80 - 120	<0.20	ug/g	NC	30
6380563	Acid Extractable Thallium (Tl)	2019/10/11	104	75 - 125	103	80 - 120	<0.050	ug/g	5.9	30
6380563	Acid Extractable Uranium (U)	2019/10/11	105	75 - 125	102	80 - 120	<0.050	ug/g	7.8	30
6380563	Acid Extractable Vanadium (V)	2019/10/11	113	75 - 125	104	80 - 120	<5.0	ug/g	7.0	30

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6380563	Acid Extractable Zinc (Zn)	2019/10/11	110	75 - 125	104	80 - 120	<5.0	ug/g	4.1	30
6380609	Hot Water Ext. Boron (B)	2019/10/11	87	75 - 125	93	75 - 125	<0.050	ug/g	2.3	40
6382349	F2 (C10-C16 Hydrocarbons)	2019/10/12	91	50 - 130	91	80 - 120	<10	ug/g	NC	30
6382349	F3 (C16-C34 Hydrocarbons)	2019/10/12	93	50 - 130	94	80 - 120	<50	ug/g	NC	30
6382349	F4 (C34-C50 Hydrocarbons)	2019/10/12	96	50 - 130	97	80 - 120	<50	ug/g	NC	30
6382354	1-Methylnaphthalene	2019/10/11	89	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40
6382354	2-Methylnaphthalene	2019/10/11	81	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40
6382354	Acenaphthene	2019/10/11	89	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
6382354	Acenaphthylene	2019/10/11	87	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40
6382354	Anthracene	2019/10/11	82	50 - 130	86	50 - 130	<0.0050	ug/g	NC	40
6382354	Benzo(a)anthracene	2019/10/11	98	50 - 130	102	50 - 130	<0.0050	ug/g	NC	40
6382354	Benzo(a)pyrene	2019/10/11	94	50 - 130	101	50 - 130	<0.0050	ug/g	NC	40
6382354	Benzo(b/j)fluoranthene	2019/10/11	90	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
6382354	Benzo(g,h,i)perylene	2019/10/11	88	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40
6382354	Benzo(k)fluoranthene	2019/10/11	94	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
6382354	Chrysene	2019/10/11	82	50 - 130	89	50 - 130	<0.0050	ug/g	NC	40
6382354	Dibenz(a,h)anthracene	2019/10/11	102	50 - 130	107	50 - 130	<0.0050	ug/g	NC	40
6382354	Fluoranthene	2019/10/11	93	50 - 130	99	50 - 130	<0.0050	ug/g	NC	40
6382354	Fluorene	2019/10/11	86	50 - 130	92	50 - 130	<0.0050	ug/g	NC	40
6382354	Indeno(1,2,3-cd)pyrene	2019/10/11	92	50 - 130	100	50 - 130	<0.0050	ug/g	NC	40
6382354	Naphthalene	2019/10/11	81	50 - 130	90	50 - 130	<0.0050	ug/g	NC	40
6382354	Phenanthrene	2019/10/11	89	50 - 130	95	50 - 130	<0.0050	ug/g	NC	40

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6382354	Pyrene	2019/10/11	92	50 - 130	97	50 - 130	<0.0050	ug/g	NC	40

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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BV Labs Job #: B9S2959
Report Date: 2019/10/16

Soil Engineers Ltd
Client Project #: 1908-E077
Sampler Initials: LT

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Brad Newman, Scientific Service Specialist

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

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Soil Engineers Ltd.
CONSULTING ENGINEERS
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BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	GRAVENHURST	PETERBOROUGH	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 440-2040	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705) 684-8522	FAX: (905) 725-1315	FAX: (905) 542-2769

APPENDIX 'D'

CERTIFICATE OF ANALYSIS
(GROUNDWATER SAMPLES)

REFERENCE NO. 1908-E077

Your Project #: 1908-E077
Your C.O.C. #: 675995-63-01

Attention: Laila Torabansari

Soil Engineers Ltd
90 West Beaver Creek Road
Unit 100
Richmond Hill, ON
CANADA L4B 1E7

Report Date: 2019/10/31
Report #: R5945568
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B9T9914
Received: 2019/10/24, 16:05

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
pH CaCl2 EXTRACT	1	2019/10/29	2019/10/29	CAM SOP-00413	EPA 9045 D m

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Methylnaphthalene Sum	1	N/A	2019/10/30	CAM SOP-00301	EPA 8270D m
1,3-Dichloropropene Sum	1	N/A	2019/10/29		EPA 8260C m
Petroleum Hydro. CCME F1 & BTEX in Water	2	N/A	2019/10/28	CAM SOP-00315	CCME PHC-CWS m
Petroleum Hydrocarbons F2-F4 in Water (1)	1	2019/10/30	2019/10/30	CAM SOP-00316	CCME PHC-CWS m
Dissolved Metals by ICPMS	1	N/A	2019/10/30	CAM SOP-00447	EPA 6020B m
PAH Compounds in Water by GC/MS (SIM)	1	2019/10/30	2019/10/30	CAM SOP-00318	EPA 8270D m
Volatile Organic Compounds and F1 PHCs	1	N/A	2019/10/29	CAM SOP-00230	EPA 8260C m

Remarks:

Bureau Veritas Laboratories are accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by BV Labs are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in BV Labs profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and BV Labs in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

BV Labs liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. BV Labs has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by BV Labs, unless otherwise agreed in writing. BV Labs is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by BV Labs, results relate to the supplied samples tested.

Your Project #: 1908-E077
Your C.O.C. #: 675995-63-01

Attention: Laila Torabansari

Soil Engineers Ltd
90 West Beaver Creek Road
Unit 100
Richmond Hill, ON
CANADA L4B 1E7

Report Date: 2019/10/31
Report #: R5945568
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: B9T9914

Received: 2019/10/24, 16:05

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.

Encryption Key

Antonella Brasil
Senior Project Manager
31 Oct 2019 12:13:34

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: Antonella.Brasil@bvlabs.com
Phone# (905)817-5817

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RESULTS OF ANALYSES OF SOIL

BV Labs ID		LCZ399	
Sampling Date		2019/10/07 10:00	
COC Number		675995-63-01	
	UNITS	BH 1/7	QC Batch
Inorganics			
Available (CaCl2) pH	pH	8.18	6412241
QC Batch = Quality Control Batch			

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PETROLEUM HYDROCARBONS (CCME)

BV Labs ID		LCZ400	LCZ402		
Sampling Date			2019/10/23		
COC Number		675995-63-01	675995-63-01		
	UNITS	TB	DUPMW	RDL	QC Batch
BTEX & F1 Hydrocarbons					
Benzene	ug/L	<0.20	<0.20	0.20	6410071
Toluene	ug/L	<0.20	<0.20	0.20	6410071
Ethylbenzene	ug/L	<0.20	<0.20	0.20	6410071
o-Xylene	ug/L	<0.20	<0.20	0.20	6410071
p+m-Xylene	ug/L	<0.40	<0.40	0.40	6410071
Total Xylenes	ug/L	<0.40	<0.40	0.40	6410071
F1 (C6-C10)	ug/L	<25	<25	25	6410071
F1 (C6-C10) - BTEX	ug/L	<25	<25	25	6410071
Surrogate Recovery (%)					
1,4-Difluorobenzene	%	106	108		6410071
4-Bromofluorobenzene	%	98	95		6410071
D10-Ethylbenzene	%	79	83		6410071
D4-1,2-Dichloroethane	%	100	96		6410071

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 DISSOLVED ICPMS METALS (WATER)

BV Labs ID		LCZ401		
Sampling Date		2019/10/23 10:00		
COC Number		675995-63-01		
	UNITS	MW	RDL	QC Batch
Metals				
Dissolved Antimony (Sb)	ug/L	<0.50	0.50	6407396
Dissolved Arsenic (As)	ug/L	<1.0	1.0	6407396
Dissolved Barium (Ba)	ug/L	250	2.0	6407396
Dissolved Beryllium (Be)	ug/L	<0.50	0.50	6407396
Dissolved Boron (B)	ug/L	61	10	6407396
Dissolved Cadmium (Cd)	ug/L	<0.10	0.10	6407396
Dissolved Chromium (Cr)	ug/L	<5.0	5.0	6407396
Dissolved Cobalt (Co)	ug/L	1.4	0.50	6407396
Dissolved Copper (Cu)	ug/L	6.0	1.0	6407396
Dissolved Lead (Pb)	ug/L	<0.50	0.50	6407396
Dissolved Molybdenum (Mo)	ug/L	0.64	0.50	6407396
Dissolved Nickel (Ni)	ug/L	2.3	1.0	6407396
Dissolved Selenium (Se)	ug/L	<2.0	2.0	6407396
Dissolved Silver (Ag)	ug/L	<0.10	0.10	6407396
Dissolved Thallium (Tl)	ug/L	<0.050	0.050	6407396
Dissolved Uranium (U)	ug/L	0.65	0.10	6407396
Dissolved Vanadium (V)	ug/L	<0.50	0.50	6407396
Dissolved Zinc (Zn)	ug/L	<5.0	5.0	6407396

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 PAHS (WATER)

BV Labs ID		LCZ401		
Sampling Date		2019/10/23 10:00		
COC Number		675995-63-01		
	UNITS	MW	RDL	QC Batch
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/L	<0.071	0.071	6406376
Polyaromatic Hydrocarbons				
Acenaphthene	ug/L	<0.050	0.050	6414365
Acenaphthylene	ug/L	<0.050	0.050	6414365
Anthracene	ug/L	<0.050	0.050	6414365
Benzo(a)anthracene	ug/L	<0.050	0.050	6414365
Benzo(a)pyrene	ug/L	<0.010	0.010	6414365
Benzo(b/j)fluoranthene	ug/L	<0.050	0.050	6414365
Benzo(g,h,i)perylene	ug/L	<0.050	0.050	6414365
Benzo(k)fluoranthene	ug/L	<0.050	0.050	6414365
Chrysene	ug/L	<0.050	0.050	6414365
Dibenz(a,h)anthracene	ug/L	<0.050	0.050	6414365
Fluoranthene	ug/L	<0.050	0.050	6414365
Fluorene	ug/L	<0.050	0.050	6414365
Indeno(1,2,3-cd)pyrene	ug/L	<0.050	0.050	6414365
1-Methylnaphthalene	ug/L	<0.050	0.050	6414365
2-Methylnaphthalene	ug/L	<0.050	0.050	6414365
Naphthalene	ug/L	<0.050	0.050	6414365
Phenanthrene	ug/L	<0.030	0.030	6414365
Pyrene	ug/L	<0.050	0.050	6414365
Surrogate Recovery (%)				
D10-Anthracene	%	117		6414365
D14-Terphenyl (FS)	%	111		6414365
D8-Acenaphthylene	%	116		6414365
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		LCZ401		
Sampling Date		2019/10/23 10:00		
COC Number		675995-63-01		
	UNITS	MW	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	6406380
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	6377771
Benzene	ug/L	<0.20	0.20	6377771
Bromodichloromethane	ug/L	<0.50	0.50	6377771
Bromoform	ug/L	<1.0	1.0	6377771
Bromomethane	ug/L	<0.50	0.50	6377771
Carbon Tetrachloride	ug/L	<0.20	0.20	6377771
Chlorobenzene	ug/L	<0.20	0.20	6377771
Chloroform	ug/L	<0.20	0.20	6377771
Dibromochloromethane	ug/L	<0.50	0.50	6377771
1,2-Dichlorobenzene	ug/L	<0.50	0.50	6377771
1,3-Dichlorobenzene	ug/L	<0.50	0.50	6377771
1,4-Dichlorobenzene	ug/L	<0.50	0.50	6377771
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	6377771
1,1-Dichloroethane	ug/L	<0.20	0.20	6377771
1,2-Dichloroethane	ug/L	<0.50	0.50	6377771
1,1-Dichloroethylene	ug/L	<0.20	0.20	6377771
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	6377771
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	6377771
1,2-Dichloropropane	ug/L	<0.20	0.20	6377771
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	6377771
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	6377771
Ethylbenzene	ug/L	<0.20	0.20	6377771
Ethylene Dibromide	ug/L	<0.20	0.20	6377771
Hexane	ug/L	<1.0	1.0	6377771
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	6377771
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	6377771
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	6377771
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	6377771
Styrene	ug/L	<0.50	0.50	6377771
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	6377771
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	6377771
Tetrachloroethylene	ug/L	<0.20	0.20	6377771
Toluene	ug/L	<0.20	0.20	6377771

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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O.REG 153 VOCS BY HS & F1-F4 (WATER)

BV Labs ID		LCZ401		
Sampling Date		2019/10/23 10:00		
COC Number		675995-63-01		
	UNITS	MW	RDL	QC Batch
1,1,1-Trichloroethane	ug/L	<0.20	0.20	6377771
1,1,2-Trichloroethane	ug/L	<0.50	0.50	6377771
Trichloroethylene	ug/L	<0.20	0.20	6377771
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	6377771
Vinyl Chloride	ug/L	<0.20	0.20	6377771
p+m-Xylene	ug/L	<0.20	0.20	6377771
o-Xylene	ug/L	<0.20	0.20	6377771
Total Xylenes	ug/L	<0.20	0.20	6377771
F1 (C6-C10)	ug/L	<25	25	6377771
F1 (C6-C10) - BTEX	ug/L	<25	25	6377771
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	6414362
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	6414362
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	6414362
Reached Baseline at C50	ug/L	Yes		6414362
Surrogate Recovery (%)				
o-Terphenyl	%	99		6414362
4-Bromofluorobenzene	%	85		6377771
D4-1,2-Dichloroethane	%	110		6377771
D8-Toluene	%	95		6377771

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

BV Labs ID: LCZ399
Sample ID: BH 1/7
Matrix: Soil

Collected: 2019/10/07
Shipped:
Received: 2019/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH CaCl2 EXTRACT	AT	6412241	2019/10/29	2019/10/29	Surinder Rai

BV Labs ID: LCZ400
Sample ID: TB
Matrix: Water

Collected:
Shipped:
Received: 2019/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	6410071	N/A	2019/10/28	Anca Ganea

BV Labs ID: LCZ401
Sample ID: MW
Matrix: Water

Collected: 2019/10/23
Shipped:
Received: 2019/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	6406376	N/A	2019/10/30	Automated Statchk
1,3-Dichloropropene Sum	CALC	6406380	N/A	2019/10/29	Automated Statchk
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	6414362	2019/10/30	2019/10/30	Anna Stuglik Rolland
Dissolved Metals by ICPMS	ICP/MS	6407396	N/A	2019/10/30	Arefa Dabhad
PAH Compounds in Water by GC/MS (SIM)	GC/MS	6414365	2019/10/30	2019/10/30	Bibin Alias Paul
Volatile Organic Compounds and F1 PHCs	GC/MSFD	6377771	N/A	2019/10/29	Yang (Philip) Yu

BV Labs ID: LCZ402
Sample ID: DUPMW
Matrix: Water

Collected: 2019/10/23
Shipped:
Received: 2019/10/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Petroleum Hydro. CCME F1 & BTEX in Water	HSGC/MSFD	6410071	N/A	2019/10/28	Anca Ganea

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	5.0°C

Revised Report (2019/10/31): Project # included as per client request.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6377771	4-Bromofluorobenzene	2019/10/28	95	70 - 130	98	70 - 130	86	%		
6377771	D4-1,2-Dichloroethane	2019/10/28	100	70 - 130	103	70 - 130	102	%		
6377771	D8-Toluene	2019/10/28	110	70 - 130	108	70 - 130	96	%		
6410071	1,4-Difluorobenzene	2019/10/28	103	70 - 130	101	70 - 130	103	%		
6410071	4-Bromofluorobenzene	2019/10/28	100	70 - 130	100	70 - 130	97	%		
6410071	D10-Ethylbenzene	2019/10/28	95	70 - 130	105	70 - 130	94	%		
6410071	D4-1,2-Dichloroethane	2019/10/28	100	70 - 130	96	70 - 130	95	%		
6414362	o-Terphenyl	2019/10/30	107	60 - 130	108	60 - 130	96	%		
6414365	D10-Anthracene	2019/10/30	105	50 - 130	109	50 - 130	119	%		
6414365	D14-Terphenyl (FS)	2019/10/30	70	50 - 130	100	50 - 130	101	%		
6414365	D8-Acenaphthylene	2019/10/30	105	50 - 130	106	50 - 130	110	%		
6377771	1,1,1,2-Tetrachloroethane	2019/10/28	103	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
6377771	1,1,1-Trichloroethane	2019/10/28	99	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
6377771	1,1,2,2-Tetrachloroethane	2019/10/28	101	70 - 130	106	70 - 130	<0.50	ug/L	NC	30
6377771	1,1,2-Trichloroethane	2019/10/28	108	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
6377771	1,1-Dichloroethane	2019/10/28	103	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
6377771	1,1-Dichloroethylene	2019/10/28	100	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6377771	1,2-Dichlorobenzene	2019/10/28	100	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
6377771	1,2-Dichloroethane	2019/10/28	95	70 - 130	99	70 - 130	<0.50	ug/L	NC	30
6377771	1,2-Dichloropropane	2019/10/28	100	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6377771	1,3-Dichlorobenzene	2019/10/28	103	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6377771	1,4-Dichlorobenzene	2019/10/28	101	70 - 130	97	70 - 130	<0.50	ug/L	NC	30
6377771	Acetone (2-Propanone)	2019/10/28	101	60 - 140	100	60 - 140	<10	ug/L	NC	30
6377771	Benzene	2019/10/28	98	70 - 130	100	70 - 130	<0.20	ug/L	NC	30
6377771	Bromodichloromethane	2019/10/28	96	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6377771	Bromoform	2019/10/28	97	70 - 130	101	70 - 130	<1.0	ug/L	NC	30
6377771	Bromomethane	2019/10/28	95	60 - 140	102	60 - 140	<0.50	ug/L	NC	30
6377771	Carbon Tetrachloride	2019/10/28	99	70 - 130	101	70 - 130	<0.20	ug/L	NC	30
6377771	Chlorobenzene	2019/10/28	99	70 - 130	98	70 - 130	<0.20	ug/L	NC	30
6377771	Chloroform	2019/10/28	100	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6377771	cis-1,2-Dichloroethylene	2019/10/28	100	70 - 130	103	70 - 130	<0.50	ug/L	NC	30

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6377771	cis-1,3-Dichloropropene	2019/10/28	86	70 - 130	92	70 - 130	<0.30	ug/L	NC	30
6377771	Dibromochloromethane	2019/10/28	101	70 - 130	103	70 - 130	<0.50	ug/L	NC	30
6377771	Dichlorodifluoromethane (FREON 12)	2019/10/28	102	60 - 140	106	60 - 140	<1.0	ug/L	NC	30
6377771	Ethylbenzene	2019/10/28	93	70 - 130	91	70 - 130	<0.20	ug/L	NC	30
6377771	Ethylene Dibromide	2019/10/28	104	70 - 130	104	70 - 130	<0.20	ug/L	NC	30
6377771	F1 (C6-C10) - BTEX	2019/10/28					<25	ug/L	NC	30
6377771	F1 (C6-C10)	2019/10/28	101	60 - 140	94	60 - 140	<25	ug/L	NC	30
6377771	Hexane	2019/10/28	104	70 - 130	105	70 - 130	<1.0	ug/L	NC	30
6377771	Methyl Ethyl Ketone (2-Butanone)	2019/10/28	103	60 - 140	107	60 - 140	<10	ug/L	NC	30
6377771	Methyl Isobutyl Ketone	2019/10/28	88	70 - 130	97	70 - 130	<5.0	ug/L	NC	30
6377771	Methyl t-butyl ether (MTBE)	2019/10/28	93	70 - 130	95	70 - 130	<0.50	ug/L	NC	30
6377771	Methylene Chloride(Dichloromethane)	2019/10/28	112	70 - 130	115	70 - 130	<2.0	ug/L	NC	30
6377771	o-Xylene	2019/10/28	92	70 - 130	92	70 - 130	<0.20	ug/L	NC	30
6377771	p+m-Xylene	2019/10/28	91	70 - 130	89	70 - 130	<0.20	ug/L	NC	30
6377771	Styrene	2019/10/28	73	70 - 130	76	70 - 130	<0.50	ug/L	NC	30
6377771	Tetrachloroethylene	2019/10/28	106	70 - 130	102	70 - 130	<0.20	ug/L	NC	30
6377771	Toluene	2019/10/28	98	70 - 130	96	70 - 130	<0.20	ug/L	NC	30
6377771	Total Xylenes	2019/10/28					<0.20	ug/L	NC	30
6377771	trans-1,2-Dichloroethylene	2019/10/28	100	70 - 130	100	70 - 130	<0.50	ug/L	NC	30
6377771	trans-1,3-Dichloropropene	2019/10/28	93	70 - 130	95	70 - 130	<0.40	ug/L	NC	30
6377771	Trichloroethylene	2019/10/28	98	70 - 130	99	70 - 130	<0.20	ug/L	NC	30
6377771	Trichlorofluoromethane (FREON 11)	2019/10/28	105	70 - 130	107	70 - 130	<0.50	ug/L	NC	30
6377771	Vinyl Chloride	2019/10/28	107	70 - 130	109	70 - 130	<0.20	ug/L	NC	30
6407396	Dissolved Antimony (Sb)	2019/10/30	109	80 - 120	100	80 - 120	<0.50	ug/L	NC	20
6407396	Dissolved Arsenic (As)	2019/10/30	104	80 - 120	98	80 - 120	<1.0	ug/L	2.9	20
6407396	Dissolved Barium (Ba)	2019/10/30	101	80 - 120	96	80 - 120	<2.0	ug/L	0.25	20
6407396	Dissolved Beryllium (Be)	2019/10/30	113	80 - 120	106	80 - 120	<0.50	ug/L	NC	20
6407396	Dissolved Boron (B)	2019/10/30	109	80 - 120	101	80 - 120	<10	ug/L	4.6	20
6407396	Dissolved Cadmium (Cd)	2019/10/30	107	80 - 120	99	80 - 120	<0.10	ug/L	NC	20
6407396	Dissolved Chromium (Cr)	2019/10/30	96	80 - 120	93	80 - 120	<5.0	ug/L	NC	20
6407396	Dissolved Cobalt (Co)	2019/10/30	99	80 - 120	98	80 - 120	<0.50	ug/L	6.7	20

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6407396	Dissolved Copper (Cu)	2019/10/30	105	80 - 120	97	80 - 120	<1.0	ug/L	NC	20
6407396	Dissolved Lead (Pb)	2019/10/30	102	80 - 120	99	80 - 120	<0.50	ug/L	NC	20
6407396	Dissolved Molybdenum (Mo)	2019/10/30	110	80 - 120	96	80 - 120	<0.50	ug/L	NC	20
6407396	Dissolved Nickel (Ni)	2019/10/30	95	80 - 120	94	80 - 120	<1.0	ug/L	NC	20
6407396	Dissolved Selenium (Se)	2019/10/30	102	80 - 120	99	80 - 120	<2.0	ug/L	NC	20
6407396	Dissolved Silver (Ag)	2019/10/30	70 (1)	80 - 120	93	80 - 120	<0.10	ug/L	NC	20
6407396	Dissolved Thallium (Tl)	2019/10/30	107	80 - 120	100	80 - 120	<0.050	ug/L	NC	20
6407396	Dissolved Uranium (U)	2019/10/30	101	80 - 120	97	80 - 120	<0.10	ug/L	NC	20
6407396	Dissolved Vanadium (V)	2019/10/30	98	80 - 120	94	80 - 120	<0.50	ug/L	4.7	20
6407396	Dissolved Zinc (Zn)	2019/10/30	102	80 - 120	98	80 - 120	<5.0	ug/L	NC	20
6410071	Benzene	2019/10/28	98	70 - 130	102	70 - 130	<0.20	ug/L	1.1	30
6410071	Ethylbenzene	2019/10/28	95	70 - 130	106	70 - 130	<0.20	ug/L	NC	30
6410071	F1 (C6-C10) - BTEX	2019/10/28					<25	ug/L	NC	30
6410071	F1 (C6-C10)	2019/10/28	103	70 - 130	99	70 - 130	<25	ug/L	NC	30
6410071	o-Xylene	2019/10/28	94	70 - 130	103	70 - 130	<0.20	ug/L	NC	30
6410071	p+m-Xylene	2019/10/28	92	70 - 130	103	70 - 130	<0.40	ug/L	NC	30
6410071	Toluene	2019/10/28	87	70 - 130	95	70 - 130	<0.20	ug/L	NC	30
6410071	Total Xylenes	2019/10/28					<0.40	ug/L	NC	30
6412241	Available (CaCl2) pH	2019/10/29			100	97 - 103			1.2	N/A
6414362	F2 (C10-C16 Hydrocarbons)	2019/10/30	127	50 - 130	123	60 - 130	<100	ug/L	NC	30
6414362	F3 (C16-C34 Hydrocarbons)	2019/10/30	NC	50 - 130	121	60 - 130	<200	ug/L	NC	30
6414362	F4 (C34-C50 Hydrocarbons)	2019/10/30	114	50 - 130	114	60 - 130	<200	ug/L	NC	30
6414365	1-Methylnaphthalene	2019/10/30	113	50 - 130	123	50 - 130	<0.050	ug/L	NC	30
6414365	2-Methylnaphthalene	2019/10/30	104	50 - 130	112	50 - 130	<0.050	ug/L	NC	30
6414365	Acenaphthene	2019/10/30	103	50 - 130	111	50 - 130	<0.050	ug/L	NC	30
6414365	Acenaphthylene	2019/10/30	106	50 - 130	112	50 - 130	<0.050	ug/L	NC	30
6414365	Anthracene	2019/10/30	102	50 - 130	110	50 - 130	<0.050	ug/L	NC	30
6414365	Benzo(a)anthracene	2019/10/30	110	50 - 130	119	50 - 130	<0.050	ug/L	NC	30
6414365	Benzo(a)pyrene	2019/10/30	103	50 - 130	113	50 - 130	<0.010	ug/L	NC	30
6414365	Benzo(b/j)fluoranthene	2019/10/30	102	50 - 130	114	50 - 130	<0.050	ug/L	NC	30
6414365	Benzo(g,h,i)perylene	2019/10/30	105	50 - 130	117	50 - 130	<0.050	ug/L	NC	30

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			Matrix Spike		SPIKED BLANK		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
6414365	Benzo(k)fluoranthene	2019/10/30	99	50 - 130	111	50 - 130	<0.050	ug/L	NC	30
6414365	Chrysene	2019/10/30	102	50 - 130	113	50 - 130	<0.050	ug/L	NC	30
6414365	Dibenz(a,h)anthracene	2019/10/30	102	50 - 130	112	50 - 130	<0.050	ug/L	NC	30
6414365	Fluoranthene	2019/10/30	110	50 - 130	120	50 - 130	<0.050	ug/L	NC	30
6414365	Fluorene	2019/10/30	104	50 - 130	111	50 - 130	<0.050	ug/L	NC	30
6414365	Indeno(1,2,3-cd)pyrene	2019/10/30	109	50 - 130	121	50 - 130	<0.050	ug/L	NC	30
6414365	Naphthalene	2019/10/30	99	50 - 130	105	50 - 130	<0.050	ug/L	NC	30
6414365	Phenanthrene	2019/10/30	107	50 - 130	115	50 - 130	<0.030	ug/L	NC	30
6414365	Pyrene	2019/10/30	109	50 - 130	118	50 - 130	<0.050	ug/L	NC	30

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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BV Labs Job #: B9T9914
Report Date: 2019/10/31

Soil Engineers Ltd
Client Project #: 1908-E077

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Anastassia Hamanov, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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