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A REPORT TO
TOWN OF NEW MARKET

PRELIMINARY PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

EXISTING RESIDENTIAL BUILDING

16780 YONGE STREET

TOWN OF NEWMARKET

Reference No. 1708-E004

November 20, 2017

DISTRIBUTION

3 Copies - Town of Newmarket

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It should be noted that the information supplied in this report may not be 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 the Town of Newmarket to carry out a Phase Two Environmental Site Assessment (Phase Two ESA), as defined by Ontario Regulation (O. Reg.) 153/04, as amended. The subject property is located at 16780 Yonge Street, in the Town of Newmarket (hereinafter referred to as "the 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).

The field work was performed at selected locations on the subject site. Soil and groundwater samples were collected and submitted for chemical analysis in accordance with the Table 8 Full Depth Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition for Residential/Parkland/ Institutional property use and for medium to fine textured soils (Table 8 Standards) as published in "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), April 15, 2011

Based on the findings of the Phase Two ESA and the delineation program, it is our opinion that shallow soil impacted with metals is located in the western and central portions of the subject site within an estimated area of 6,900 m^2 and 5,600 m^2, respectively, and extending to a depth of 0.7 mbgs. The concentration of petroleum hydrocarbon fraction F1 in the groundwater samples collected from one (1) monitoring well (BH/MW19) exceeded the Table 8 Standard.

We recommend that a remedial action plan be designed and implemented to address the identified impacted soil and groundwater at the subject site.

2.0 INTRODUCTION

Soil Engineers Ltd. (SEL) was retained by Ms. Sepideh Maidi of the Town of Newmarket 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 subject property is located at 16780 Yonge Street, in the Town of Newmarket (hereinafter referred to as "the 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 is irregular in shape and approximately 11.65 ac (4.71 ha.) in area. It is located at the northwest quadrant of Mulock Drive and Yong Street in the Town of Newmarket. The municipal address assigned to the subject site is 16780 Yong Street. The subject site consist of a single parcel with the Property Identification Number (PIN) 03589-1086 (LT). It is described in the Parcel Register as PT LOT 91 CON 1 (K), PT 6 65R13937 SAVE & EXCEPT PTS 2 & 3 65R14293 & SAVE & EXCEPT PT 1 EXPROP PLAN YR2071906; S/T TEMPORARY EASE OVER PT 2 EXPROP PALN YR2071906; SUBJECT TO A TEMPORARY EASEMENT UNTIL 2019/01/01 OVER PART 1 ON EXPROP PLAN YR2528795 COMMENCING 2016/12/08 AS IN YR2528795; TOWN OF NEWMARKET.

At the time of the site assessment, a residential building, a swimming pool and a pool house, a storage shed and a parking garage were located on the central and west portions of the subject site.

The subject site is located in a mixed parkland/residential/commercial area within the Town of

Newmarket. The neighbouring properties consist mainly of residential properties to the north and southwest, commercial properties to the east and southeast, parkland to the west and vacant land to the south. Mulock Drive and Yonge Street are adjacent to the east and south of the subject site, respectively.

Based on a 2003 Ontario based map a watercourse is present on the southeast portion of the subject site. The ground surface is relatively flat with minor undulations, and the grade at the subject site generally descends towards the southeast.

2.2 Property Ownership

This Phase Two ESA was commissioned to address the environmental concerns in accordance with our proposal dated August 29, 2017. Ms. Sepideh Majdi of Town of Newmarket approved the investigation on September 6, 2017. Our client can be contacted at:

Town of Newmarket
395 Mulock Drive
Newmarket, Ontario
L3Y 4X7

Attn: Ms. Sepideh Majdi

2.3 Current and Proposed Future Uses

The subject site is currently used for residential purposes. It is anticipated that any new development at the subject site will be provided with municipal services meeting urban standards.

2.4 Applicable Site Condition Standards

SEL has selected the applicable assessment criteria from Ontario Regulation 153/04, as amended, made under the Environmental Protection Act, 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 soil samples is between 5 and 9.
- The property is not a shallow soil property, as the bedrock was not encountered within 2.0 m of the ground surface during the investigation.
- The subject site is located in a mixed parkland/commercial/residential area within the Town of Newmarket. Based on the information obtained from the Phase One ESA, there is no water well located at the subject site. However, there are records of thirteen (13) water wells at the neighbouring properties within 250m from the subject site.
- Based on a 2003 Ontario Based Map, a watercourse is present on the southeast portion of the subject site.
- Generic criteria are to be used in this assessment.
- The subject site is currently used for residential purpose.
- Sieve analysis was conducted on soil samples BH1/6, BH6/6, and BH9/6 indicated that 93%, 96.7% and 96.7% of the soil particles passed through a 75 micron screen, respectively. Hence, the native soil at the subject site is considered as medium and fine textured soil.

Based on the above information, the Ministry of the Environment and Climate Change (MOECC) Table 8 Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition, for all property uses other than agricultural use and for medium and fine textured soil under Part XV.1 of EPA (Table 8 Standards) 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 mixed parkland/commercial/residential area in the Town of Newmarket. The neighbouring properties consist mainly of residential properties to the north and southwest, commercial properties to the east and southeast, parkland to the west and vacant land to the south across Mulock Drive.

According to the Physiographic map of Southern Ontario (2007), compiled by the Ontario Geological Survey and available for review through Google Earth on the Ontario Ministry of Northern Development and Mines website, the subject site is situated in the physiographical region known as the Simcoe Lowlands.

A review of a Geological Map of the area, located at the Geological Survey of Canada website indicates that the west portion of the subject site is underlain predominantly by glaciofluvial ice-contact deposits composed of gravel and sand and the east portion of the subject site is underlain by Newmarket Till material, predominantly composed of sandy silt to silt deposits.

Yonge Street and Mulock Drive are adjacent to the east and south of the subject site, respectively. A 2003 Ontario Based Map indicates that a watercourse is present at southeast portion of the subject site. The ground surface at the subject site appears uneven with a general slope descending towards the southeast. The subject site is located in the larger hydrogeological region known as Southern Ontario Lowlands. A watershed map from the Land Information Ontario website shows that the subject site is situated in the Lake Simcoe Watershed.

Based on the review of the Ministry of Natural Resources and Forestry's Natural Feature Map for listings of the various classes of natural areas located within the vicinity of the subject site, there is no Area of Natural or Scientific Interest (ANSI) or Environmentally Sensitive Area

(ESA) located at the subject site or neighbouring properties within the Phase One Study Area.

3.2 Past Investigations

The following previous investigation reports for the subject site were reviewed as part of this Preliminary Phase Two ESA:

- A Report to the Town of Newmarket, A Geotechnical Investigation for an Existing Residential Properly, 16780 Yonge Street, Town of Newmarket. Prepared by Soil Engineers Ltd., Reference No. 1708-S019 dated October, 2017.
- Phase One Environmental Site Assessment, Existing Residential Building, 16780 Yonge Street, Town of Newmarket, prepared by Soil Engineers Ltd. Reference No. 1708-E004 dated September 13, 2017.

The geotechnical investigation was conducted in conjunction with this Phase Two ESA. Sieve analysis was conducted on native soil samples BH1/6, BH6/6, and BH9/6 indicated that 93%, 96.7% and 96.7% of the soil particles passed through a 75 micron screen. Hence, the native soil at the subject site was classified as silt to silty clay (fine textured soil).

The Phase One ESA identified the following Areas of Environmental Concern (APECs) at the subject site:

APEC 1: Potential soil and groundwater impact due the previously reported presence of soil with elevated petroleum hydrocarbon concentrations and potential impact to groundwater at the location of the former underground fuel storage tank (UST) adjacent to the north-central portion of the on-site residential.

APEC 2: Potential soil/groundwater impact due to the presence of two (2) fuel oil aboveground storage tanks (ASTs) located in the basement of the residential building at the subject site at the north central portion of the subject site.

APEC 3: Potential soil/groundwater impact due to the presence of one (1) fuel AST located to the north of the parking garage at the subject site.

APEC 4: Potential soil impact due to the presence of one (1) fuel AST located adjacent to the west of the pool house at the subject site.

APEC 5: Potential soil impact due to the anticipated use of pesticides as part of former agricultural activities at the subject site.

It should be noted that fill material was encountered at borehole locations BH1, BH2 and BH3 during the field investigation. Therefore, the following additional concerns is accessed during this Preliminary Phase Two ESA.

APEC 6: Potential soil impact due to the presence of fill material of unknown quality at the subject site.

The Sampling and Analysis Plan for our Phase Two ESA was prepared and executed based on the findings of our Phase One ESA.

4.0 SCOPE OF THE INVESTIGATION

4.1 Overview of Site Investigation

The purpose of this investigation (Phase Two ESA) is to assess the soil and groundwater quality at the 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:

- Locate the underground and overhead utilities.
- Conduct a total of nine (9) boreholes to depths ranging from 2.87 to 6.6 m below ground surface (mbgs).
- Collect representative soil samples from the 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 monitoring wells in five (5) of the boreholes for groundwater sampling and testing.
- Conduct groundwater monitoring program and collect groundwater samples for chemical testing.
- Carry out analytical testing program on selected soil and groundwater samples, including quality assurance and quality control (QA/QC) samples, for one or more of the following parameters: metals and inorganics, volatile organic compounds (VOCs), organochlorine pesticides (OCs) and petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenzene and xylenes (BTEX).
- Review analytical testing results of submitted soil and groundwater samples using the applicable Site Condition Standards.

- Prepare a Phase Two ESA report containing the findings of the investigation.

The rationale for the selection of borehole 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 were investigated during the Phase Two ESA in accordance with the Sampling and Analysis Plans provided in Appendix 'A'. No sediment sampling was conducted, as no surface water was observed at the subject site at the time of this investigation.

Boreholes were advanced using a mobile drill rig equipped with split-spoon samplers. Soil samples were logged in the field, and headspace vapour screening was conducted for all retrieved soil samples using a combustible gas detector (RKI Eagle).

Groundwater monitoring wells were installed in 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). The groundwater samples scheduled for analysis of metal parameters were passed through a 0.45 micron filter as part of the sampling process.

4.3 Phase One Conceptual Site Model

A plan illustrating the features of the subject site and Phase One Study Area including locations of potential contaminating activities (PCAs) is presented in Drawing No. 1.

4.4 Deviations From Sampling and Analysis Plan

Fill material of unknown quality was encountered at three (3) borehole locations during the field investigations. The fill material was analyzed during this Phase Two ESA.

A soil and groundwater delineation program including drilling boreholes, installation of monitoring wells and the collection of soil and groundwater samples for chemical analysis was conducted in the areas of the identified impacted soil and groundwater.

4.5 Impediments

A tree, a garden and a pool house impeded access to the sampling location BH/MW1. Hence, the borehole was installed approximately 2 m south of the above ground fuel storage tank (AST) locations next to the pool house. However, a surface soil sample TP1, was collected underneath the AST.

The recharge rate and amount of groundwater in one (1) of the monitoring wells (BH/MW5) was very small. Hence, the well was developed and the groundwater samples were collected in two (2) sampling events without purging.

5.0 INVESTIGATION METHOD

5.1 General

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

The Phase Two ESA consisted of drilling nine (9) boreholes, installation of monitoring wells in five (5) selected boreholes, field measurements, monitoring, and collection of soil samples from the boreholes and groundwater samples from the installed monitoring wells for chemical analysis. The soil and groundwater samples were assessed for the potential contamination with respect to the APECs identified by our 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 Program

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

The field work for this investigation was conducted on August 31 and September 1, 2017 and consisted of drilling nine (9) boreholes (designated BH1 to BH9) to depths ranging from 2.1m to 9.0 mbgs. Five (5) of the boreholes were completed as monitoring wells for groundwater observation, sampling and testing. The locations of the boreholes are shown

on Drawing No. 2.

The boreholes were advanced using a track-mounted drill rig, equipped with sampling devices, supplied by a specialist drilling contractor, Pontil Drilling. Soil samples from the boreholes were recovered at regular intervals, using split spoon sampler for soil classification and visual and olfactory observations.

Drilling equipment 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 power washed to remove any adhered soils, foreign material and potential contaminants.

In addition, the spilt-spoon sampler and any sub-sampling equipment is decontaminated prior to each usage.

A hand dug test pit (TP1) was conducted at the location of an AST next to the pool house to collect a soil sample.

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

5.3 Soil and Groundwater Delineation

The field work for the delineation of impacted soil and groundwater was conducted on October 10 and 11, 2017. The program consisted of drilling eleven (11) boreholes (designated BH10 to BH20) and installation of two (2) monitoring wells in BH19 and BH20. The boreholes were advanced using a Pionjar drilling system and a mobile drill rig, equipped with sampling devices, supplied by a specialist drilling contractor, Sonic Soil sampling Inc.

5.4 Soil: Sampling

Soil samples from the boreholes were retrieved at regular intervals, using a stainless steel split spoon sampler. 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 by the sampler with new disposable gloves in order to avoid the risk of cross-contamination between the samples. 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. A small amount of the soil sample was retrieved by a disposable 'T' shaped Terracore sampler, and the soil samples from the Terracore sampler were stored in methanol vials for petroleum hydrocarbon fraction F1 and VOCs analyses.

The ground surface at the borehole/monitoring well locations was covered with a layer of topsoil, gravel or concrete. The subsurface soil underlying the topsoil, gravel and/or concrete consists of strata of silt, silty sand, silty clay and silty clay till at various depths and locations.

Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs provided in Appendix 'B'. The Borehole Location Plan is shown on Drawing No. 2. The locations of cross-sections for soil stratigraphy at the subject site is presented on Drawing No. 3. Geological Cross Sections A-A' and B-B', are presented on Drawing No. 4.

Based on soil vapour measurements and visual and olfactory observations, representative worst case soil samples from each borehole were selected and sent to the laboratory for chemical analyses.

5.5 Field Screening Measurements

The headspace vapour concentrations were measured using a portable RKI Eagle gas detector, TYPE 101 to include flammable gases with the exception of methane (methane elimination mode), and having a minimum detection level of 2 ppm (parts per million by volume). Prior to

taking the measurements, the instrument was calibrated to hexane standards for both ppm and lower explosive limit (LEL) scales according to the instruction manual for the instrument. Our technician was trained by the supplier for the proper calibration procedure. The instrument is calibrated or tuned up by the supplier (Pine Environmental Service Inc.) seasonally.

The results of the soil vapour measurement for samples at locations where volatile parameters were considered a concern are presented in the Borehole Logs, Appendix 'B'.

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

5.6 Groundwater: Monitoring Well Installation

A total of five (5) groundwater monitoring wells were installed at the subject site by Pontil Drilling Inc. Two (2) of the monitoring wells were installed in the basement of the building. The monitoring wells, installed inside the building, were constructed using 25 mm diameter PVC screen, 1.5 to 2.3 m in length, while the monitoring wells, installed out side the building, were constructed using 50 mm diameter PVC screen, 3 m in length. A PVC riser was capped at the top of the screen section to grade. A sand pack, consisting of clean silica sand, was placed around the screened zone with a bentonite seal placed above the sand pack. Each well was sealed with concrete to approximately 0.3 mbgs and the risers were protected by steel 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.

All monitoring wells installed at the subject site were instrumented with dedicated low-density polyethylene tubing to facilitate well development, purging and sampling requirements.

Groundwater development was performed following the drilling on September 1 and 6, 2017. The monitoring wells have been developed to remove any fluids that may have been introduced into the well during drilling and to remove particles that may have become entrained in the well and filter pack (three well casing volumes of groundwater in each well). Purged water was contained and stored in labeled containers at the subject site for future disposal).

5.7 Groundwater: Field Measurement of Water Quality Parameters

Groundwater monitoring and purging was conducted at the subject site on September 19, 2017. Water level measurements 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 product / surface sheen and any odours present during developing 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 potential cross-contamination between monitoring wells.

The measured water levels and field observations are presented in Table II.

5.8 Groundwater: Sampling

The well development was conducted on September 1 and 6, 2017. A minimum of thee (3) well casing volumes of groundwater from each well was purged to ensure potential contamination from drilling was flushed out of the system. Purge water was contained and stored on site for future disposal.

Groundwater sampling was conducted on September 6, 7 and 12, 2017, after purging and allowing the groundwater to stabilize. The groundwater purging and sampling activities were carried out using dedicated low-density polyethylene tubing. Groundwater samples were collected into laboratory-supplied containers, prepared with preservative for the analysis being conducted. The samples scheduled for analysis of metals were passed through a 0.45 micron

filter as part of the sampling process.

Due to the slow recharge rate and insufficient amount of groundwater in the monitoring well BH/MW5, groundwater samples were collected without purging.

5.9 Sediment: Sampling

Sediment was not assessed as part of this investigation as no surface water was observed at the subject site at the time of this investigaiton.

5.10 Analytical Testing

The soil and groundwater samples were analysed by AGAT Laboratories Ltd. (AGAT) in Mississauga, Ontario. AGAT is accredited by Canadian Association for Laboratory Accreditation (CALA) in accordance with ISO/IEC 17025:2005 – "General Requirements for the Competence of Testing and Calibration Laboratories" for all the parameters analysed during this investigation.

5.11 Residue Management Procedures

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

On November 3, 2017, Apex Environmental Services Inc. removed all the barrels and groundwater storage containers from the subject site. The material were taken to a licensed facility for disposal.

5.12 Elevation Surveying

The ground elevation of the boreholes were determined in the field using a GNSS Geoexplorer 6000 series surveying machine. The Elevations are presented on the Borehole Logs in Appendix 'B'.

The elevations at the borehole and monitoring well locations are presented in the Table 1 and borehole/monitoring well logs (Appendix B).

5.13 Quality Assurance and Quality Control Measures

The soil and groundwater Sampling and Analysis Plan provided in Appendix 'A' was prepared and executed 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. Reg. 511/09 and O. Reg. 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 as follows:

- The collection of at least one field duplicate sample per site for every sampling media for every ten (10) samples collected (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 ^{o}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 by 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 and trip blank samples are discussed in the Section 6.0 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 subsurface soil underlying the topsoil, gravel and/or concrete consist of strata of silt, silty sand, silty clay and silty clay till at various depths and locations. No bedrock was encountered during the Preliminary Phase Two ESA. Detailed descriptions of the encountered subsurface conditions are presented on the Borehole Logs provided in Appendix 'B'.

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

Topsoil

Topsoil, approximately 0.10 to 0.46 m in thickness, is contacted at the surface of the sampling locations BH1, BH2, BH6 to BH18.

Gravel and Concrete

Gravel, approximately 10 to 46 cm in thickness, is contacted at the surface of the sampling locations BH3, BH19 and BH20, and concrete approximately 13 cm in thickness was contacted in the basement at the sampling locations of BH4 and BH5.

Silty Sand Fill

At the sampling locations BH1 and BH2, a layer of silty sand to sandy silt fill is encountered below the topsoil layer to depths of approximately 0.8 mbgs.

Silty Clay Fill

A layer of silty clay fill was encountered below the gravel at the sampling location BH3, the topsoil in sampling locations BH10, BH13, BH15 and the gravel at sampling locations BH19 and BH20 . The silty clay fill appears to be reworked native material which extend to approximately 1.2 mbgs. Borehole BH10 was terminated within this layer.

Silt

A layer of silt was encountered below the fill at sampling location BH1 and the topsoil at the sampling locations BH6, BH7, BH8 and BH9. The silt layer extends to depths of 6.6 mbgs. Borehole BH 7 was terminated within this layer.

Sandy Silt

A layer of sandy silt was encountered below the silt layer at sampling location BH1. The sandy silt layer extended to depths of 6.7 mbgs. Borehole BH 1 was terminated within this layer

Silty Clay

A layer of silty clay was encountered below the fill and concrete layers at sampling locations BH2 to BH5, and the silt layer at sampling location BH6, BH8, BH9, BH11 to BH20 . The silty clay layer extends to depths of 6.7 mbgs. Borehole BH2 to BH6, BH8, BH9, and BH11 to BH20 were terminated within this layer

Silty Clay Till

The silty clay till was encountered at BH15 interbedding the silty clay layer at sampling location BH4. Borehole BH15 was terminated within this layer.

Hydrogeology

Groundwater monitoring program was conducted on September 19, 2017. Based on the field observation and groundwater monitoring records (as indicated in the section below), shallow groundwater is present in the silt and silty clay deposits. This hydrogeologic unit at the subject site was investigated in the Preliminary Phase Two ESA.

6.2 Groundwater: Elevations and Flow Direction

Five (5) monitoring wells were installed at selected borehole locations during the field investigation for the Preliminary Phase Two ESA on August 31 and September 1, 2017. The monitoring wells were installed at various depths, within the glacial till deposit. Groundwater monitoring data were documented during the groundwater monitoring/purging round on September 19, 2017.

During groundwater monitoring round on September 19, 2017, water levels were measured at depths of 2.64, 4.05, 3.45, 2.41 and 2.75 mbgs in the monitoring wells BH/MW1, BH/MW2, BH/MW3, BH/MW4 and BH/MW5, respectively.

The ground elevations of the monitoring wells were surveyed using a Trimble Geoexplorer 6000 series GeoXH handheld Global Navigation Satellite System. Water level and temperature measurements were taken using a water level meter (Dipper-T). The top of the well casings were used as a reference point to determine a depth to the groundwater table. The measurements were reduced to static elevations based on the monitoring well survey data. Shallow groundwater levels were used to determine the flow direction. Based on the groundwater monitoring records, the groundwater flow direction appears to be in the southeast direction. No free product or surface sheen was observed in any of the monitoring wells.

The residential building at the subject site is constructed with a basement. There is a swimming pool and a septic system within the subject site. Underground utilities (gas, hydro, Bell and water) were also found to be present in the vicinity of some of the building structures

at the subject site. The presence of subsurface structures may affect the flow rate and direction of the groundwater flow.

The groundwater data measured in the monitoring wells are summarized in the 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 monitoring records of September 19, 2017, the horizontal hydraulic gradient for the investigated aquifer within the silty clay till at the subject site is between 0.01 and 0.0.17 (average 0.014).

6.4 Fine-Medium Soil Texture

A grain size analyses was conducted as part of the geotechnical investigation (discussed in Section 3.2), at the subject site. The results of the analysis conducted on native soil samples BH1/6, BH6/6, and BH9/6, indicated that 93%, 96.7% and 96.7% of the soil particles passed through a 75 micron screen, respectively. Based on the results the native soil at the subject site is described as medium and fine testure. Therefore, the site condition standards for medium and fine textured soils were used in this assessment.

6.5 Soil: Field Screening

Head space vapour screening was conducted for retrieved soil samples at location where volatile parameter were a potential environmental concern, using a combustible gas detector (RKI Eagle).

Soil vapour measurements measured from non-detected to 5 ppm were recorded for the soil samples, indicating insignificant organic volatile vapours in all soil samples retrieved from the boreholes.

6.6 Soil Quality

Representative "worst case" soil sample from each borehole 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 metals and inorganics, organochlorine pesticides (OCs) and/or petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenze and xylenes (BTEX).

The soil test results were reviewed using the Table 8, Generic Site Condition Standards for Use within 30 m of a Water Body in a Potable Groundwater Condition for all property uses other than agricultural property use and for medium textured soils as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), April 15, 2011 (Table 8 Standards).

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

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

Metals and Inorganics

Five (5) original soil samples were submitted for analysis of metal and inorganic parameters, four (4) original soil samples and two (2) duplicate soil samples were submitted for analysis of metal parameters. One (1) soil sample was submitted for pH analysis.

The pH of the tested soil samples (representative samples of surface soil and subsurface soil) were found in the range of 5 to 9, which is within the limits for the use of the generic criteria of O. Reg. 153/04, as amended.

The concentrations of metal and inorganic parameters in the tested soil samples meet the Table 8 Standards, with the exception of elevated concentrations of lead in soil samples BH1/1, BH2/1 and BH3/1, and elevated concentration of zinc in soil sample BH2/1.

Subsequently, a delineation program was conducted. The analytical results of the delineation program indicated that the soil impacted with lead and zinc is located within the areas estimated at 6,900 m^2 on the west portion of the subject site and 5,600 m^2 on the central portion of the subject site. The impacted soil extend to a depth of approximately 0.7 mbgs. The location of the delineation boreholes and the areas of metal impacted soil and the wells with impacted groundwater at the subject site are shown on Drawing No. 6.

Organochlorine Pesticides (OCs)

Six (6) original soil samples were submitted for analysis of OC parameters. The test results indicate that the concentrations of the OC parameters in the analyzed soil samples were below laboratory detection limits (RDLs), with the exception of trace amounts of DDE in soil sample BH2/1. The concentration of OC parameter in all the soil samples, collected during this investigation, meet the Table 8 Standards.

Petroleum Hydrocarbons (PHCs)

Six (6) original soil samples were submitted for analysis of PHCs. The test results indicate that the concentrations of the PHC parameters in the analyzed soil samples collected during this investigation, were below the RDLs and meet the Table 8 Standards.

6.7 Groundwater Quality

Groundwater samples collected from the five (5) monitoring wells at the subject site were submitted to the laboratory for chemical analyses of metals and inorganics, and/or PHCs.

The groundwater test results were reviewed using the Table 8 Standards.

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

The Certificates of Analyses for the groundwater samples are presented in Appendix 'D'.

The findings of the groundwater test results are summarized below.

Metals and Inorganics

Five (5) original groundwater samples and one (1) duplicate groundwater sample were submitted for analysis of metals and inorganic parameters.

The concentrations and values of metals and inorganic parameters in the tested groundwater samples meet the Table 2 Standards.

Petroleum Hydrocarbons (PHCs)

Five (5) original groundwater samples were submitted for analysis of PHC (including BTEX) parameters. One (1) trip blank sample was submitted for analysis of PHC fraction F1 and BTEX analysis. The concentrations of the analyzed groundwater samples, collected during this investigation, and trip blank samples were below the laboratory RDLs and meet the Table 8 Standards.

During the delineation program two (2) monitoring wells were installed in the vicinity of the former UST location. Analytical results of two (2) groundwater samples from the wells indicated that the concentration of petroleum hydrocarbon fraction F2 in one (1) monitoring well BH/MW19 exceeded the Table 8 Standard.

6.8 Sediment Quality

Sediment was not assessed as part of this investigation, as there is no surface water at the subject site.

6.9 Quality Assurance and Quality Control Results

The Preliminary Phase Two ESA was carried out in accordance with the Sampling and Analysis Plan provided in Append 'A' 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 investigation, QC samples in the form of field duplicate and trip blank samples were analyzed. Field duplicate samples were collected in the field for analysis of metal and inorganics in soil and groundwater, and for PHC F1 and BTEX in groundwater. Analytical details for QA/QC samples are presented in Appendices 'C' and 'D'.

Field Duplicate

A total of three (3) field duplicate soil samples and two (2) field duplicate groundwater samples 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
DUP 1	BH 4/1	Soil	Metals
DUP 2	BH 1/1		
DUP-S1	BH13/1		
WDUP2	MW 1	Groundwater	Metals & Inorganics
DUP-W1	MW20		Petroleum Hydrocarbons

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

Trip Blank

One trip blank sample was submitted to the laboratory for analysis of petroleum hydrocarbon fraction F1 and BTEX. The concentrations of the parameter in the trip blank sample was found to be below the laboratory RDLs.

There was no issue with the trip blank that was shipped with the batch of the groundwater samples submitted for analysis.

The Certificates of Analysis for the QA/QC samples are included in Appendices ‘C’ and ‘D’.

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 Appendices ‘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, Reporting Detection Limits (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 Reported Detection Limits were met for all tested parameters.
- The result of the laboratory duplicate samples is similar to the results for the original samples and relative percent differences for 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.

7.0 CONCLUSIONS

The purpose of the Preliminary Phase Two ESA was to determine the soil and groundwater quality at the subject site, as related to the following Areas of Potential Environmental Concerns (APECs) identified in our Phase One ESA and during the drilling investigation:

APEC 1: Potential soil and groundwater impact due the previously reported presence of soil with elevated petroleum hydrocarbon concentrations and potential impact to groundwater at the location of the former underground fuel storage tank (UST) adjacent to the north-central portion of the on-site residential building.

APEC 2: Potential soil/groundwater impact due to the presence of two (2) fuel oil aboveground storage tanks (ASTs) located in the basement of the residential building at the subject site at the north central portion of the subject site.

APEC 3: Potential soil/groundwater impact due to the presence of one (1) fuel AST located to the north of the parking garage at the subject site.

APEC 4: Potential soil impact due to the presence of one (1) fuel AST located adjacent to the west of the pool house at the subject site.

APEC 5: Potential soil impact due to the anticipated use of pesticides as part of former agricultural activities at the subject site.

It should be noted that fill material was encountered at borehole locations BH1, BH2 and BH3 during the field investigation. Therefore, the follwing additional concerns is accessed during this Preliminary Phase Two ESA.

APEC 6: Potential soil impact due to the presence of fill material of unknown quality at the subject site.

The findings of the field investigation and analytical results of the Preliminary Phase Two ESA are summarized below.

- The field investigation for this Preliminary Phase Two ESA consisted of drilling nine (9) boreholes (designated as BH 1 to BH 9) to depths ranging from 2.87 to 6.7 m

below existing ground surface (mbgs). Five (5) of the boreholes (BH1, BH2, BH3, BH 4 and BH5) were completed as monitoring wells for groundwater observation, sampling and testing. A delineation program was conducted. The program consisted of drilling eleven (11) boreholes (designated BH10 to BH20) and installation of two (2) monitoring wells in BH19 and BH20.

- The ground surface at the borehole/monitoring well locations was covered with a layer of topsoil, gravel or concrete. The subsurface soil underlying the topsoil, gravel and/or concrete consists of strata of silt, silty sand, silty clay and silty clay till at various depths and locations
- The soil samples retrieved from the boreholes were examined for visual and olfactory evidence of potential contamination. No evidence of contamination was documented in any of the retrieved soil samples.
- Head space vapour screening was conducted for soil samples at locations where volatile parameters were considered a concern, using a combustible gas detector (RKI Eagle). Soil vapour measurements ranged from non-detect to 5 ppm were recorded for the soil samples, indicating insignificant volatile vapours in all of the soil samples retrieved from the boreholes.
- Based on the soil vapour measurements and visual and olfactory observations, representative "worst case" soil samples were selected from each borehole for chemical analyses. A total of thirty five (35) soil samples (including QA/QC samples) were submitted for analysis: metals and inorganics, organochlorine pesticides (OCs), and petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenzen and xylenes (BTEX) in the initial investigation and the following delineation program.
- Based on the field observation and groundwater monitoring records, shallow groundwater is present in the silt and silty clay deposit. Water levels were recorded at depths of 2.64, 4.05, 3.45, 2.41, 2.75, 3.83 and 4.70 mbgs in the monitoring wells BH/MW1, BH/MW2, BH/MW3, BH/MW4, BH/MW5, BH19/MW and BH20/MW respectively.
- Based on the available water table elevation, the horizontal hydraulic gradient for the investigated aquifer within the silty clay till at the subject site is between 0.01 and 0.017 (average 0.014).

- No visible sheen or odours were recorded in the groundwater at the) monitoring wells installed at the subject site. Sixteen (16) groundwater samples (including QA/QC samples) were submitted for analysis of metals and inorganics, OCs and PHC (including BTEX) in the initial stage of the investigation and the following delineation program.
- As part of the QA/AC program for the investigation, QC samples in the form of field duplicate and trip blank samples were analysed. Field duplicate samples were collected in the field and tested for metal parameters in soil and PHC fraction F1 and BTEX in groundwater. Two (2) trip blank were shipped with the batch of the groundwater samples for PHC fraction F1 and BTEX analysis.
- The analytical results were reviewed using the Table 8, Generic Site Condition Standards for Use within 30m of a Water Body in a Potable Groundwater Condition for all property uses other than agricultural property use as published in the "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act" (EPA), April 15, 2011 (Table 8 Standards).
- A review of the analytical results of the soil samples indicated that the concentration of the analyzed parameters in the soil and groundwater samples meet the Table 8 Standards with the exception of the concentrations of lead in soil samples BH1/1, BH2/1 and BH3/1, and concentrations of zinc in soil sample BH2/1, which exceeds the Table 8 Standards.
- Subsequently a delineation program was conducted. The analytical results of the delineation program indicated that the lead and zinc exceedances are located in an area estimated at 6,900 m^2 on the west portion of the subject site and zinc exceedances are located in an area estimated 5,600 m^2 on the central portion of the subject site. Analytical results of two (2) groundwater samples from the wells indicated that the concentration of petroleum hydrocarbon fraction F2 in the monitoring well BH/MW19 exceeded the Table 8 Standard.
- The result of the analysis of the duplicate samples are similar to the results for the original samples and relative percent differences for the detectable tested parameters are the within acceptable range.
- The results of the trip blank samples indicate that the tested parameters in the samples

were below the reported laboratory detection limits (RDLs). There was no issue with the trip blanks that were shipped with the batch of the groundwater samples submitted for analysis.

Based on the findings of the Preliminary Phase Two ESA and the delineation program, it is our opinion that shallow soil impacted with metals is located in the western and central portions of the subject site within the estimated area of 6,900 m^2 and 5,600 m^2, respectively, and extending to a depth of 0.7 mbgs. The concentration of petroleum hydrocarbon fraction F1 in one (1) monitoring well (BH/MW19) exceeds the Table 8 Standard.

We recommend that a remedial action plan be designed and implemented to address the identified impacted soil and groundwater at the subject site.

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8.0 REFERENCES

MOECC. "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.

MOECC. "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.

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

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APPENDIX 'A'

SAMPLING ANALYSIS PLAN

REFERENCE NO. 1708-E004

This Sampling and Analysis Plan is prepared for a Phase Two Environmental Site Assessment (Phase Two ESA) as defined by Ontario Regulation (O. Reg.) 153/04, as amended. The subject property is located at 16780 Yonge Street, in the Town of Newmarket (hereinafter referred to as "the subject site").

The Sampling and Analysis Plan is prepared based on the findings of our Phase One Environmental Site Assessment (Phase One ESA), Reference No. 1708-E004 dated September 13, 2017.

1) **OBJECTIVE**

The objective of the Phase Two ESA was to determine the soil and groundwater quality at the subject site, as related to the following Areas of Potential Environmental Concerns (APECs) identified in the Phase One ESA by SEL:

APEC 1: Potential soil and groundwater impact due the previously reported presence of soil with elevated petroleum hydrocarbon concentrations and potential impact to groundwater at the location of the former underground fuel storage tank (UST) adjacent to the north-central portion of the on-site residential.

APEC 2: Potential soil/groundwater impact due to the presence of two (2) fuel oil aboveground storage tanks (ASTs) located in the basement of the residential building at the subject site at the north central portion of the subject site.

APEC 3: Potential soil/groundwater impact due to the presence of one (1) fuel AST located to the north of the parking garage at the subject site.

APEC 4: Potential soil impact due to the presence of one (1) fuel AST located adjacent to the west of the pool house at the subject site.

APEC 5: Potential soil impact due to the anticipated use of pesticides as part of former agricultural activities at the subject site.

2) SCOPE OF WORK

The scope of work for this investigation includes:

- Locate the underground and overhead utilities.
- Conduct a total of nine (9) boreholes to depths ranging from 2.87 to 6.6 m below ground surface (mbgs).
- Collect representative soil samples from the 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 monitoring wells in five (5) of the boreholes for groundwater sampling and testing.
- Conduct groundwater monitoring program and collect groundwater samples for chemical testing.
- Carry out analytical testing program on selected soil and groundwater samples, including quality assurance and quality control (QA/QC) samples, for one or more of the following parameters: metals and inorganics, volatile organic compounds (VOCs), organochlorine pesticides (OCs) and petroleum hydrocarbons (PHCs) including benzene, toluene, ethylbenzene and xylenes (BTEX).
- Review analytical testing results of submitted soil and groundwater samples using the applicable Site Condition Standards.
- Prepare a Phase Two ESA report containing the findings of the investigation.

3) RATIONALE OF BOREHOLE / MONITORING WELL LOCATION

The rationale for the selection of the borehole/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 the presence of soil with elevated petroleum hydrocarbon concentrations and potential impact to groundwater at the location of the former underground fuel storage tank (UST) adjacent to the north-central portion of the residential building at site building.	BH/MW3 BH/MW4 BH/MW5
APEC 2: Potential soil/groundwater impact due to the presence of two (2) fuel oil aboveground storage tanks (ASTs) located on the north-central portion in the basement of the residential building at the subject site.	BH/MW5
APEC 3: Potential soil/groundwater impact due to the presence of one (1) fuel AST located to the north of the parking garage at the subject site.	BH/MW2
APEC 4: Potential soil impact due to the presence of one (1) fuel AST located adjacent to the west of the pool house at the subject site.	BH/MW1
APEC 5: Potential soil impact due to the anticipated use of pesticide as part of former agricultural activities at the subject site.	BH1, BH2, BH6, BH7, BH8, BH9

The locations of proposed borehole/monitoring well for the Phase Two ESA are 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 / MW		M & I	PHC	OCP	F1/BTEX	pH	Metals
SOIL	BH1	1	1	1	-	-	-
	BH2	1	1	1	-	-	-
	BH3	1	1	-	-	1	-
	BH4	1	1	-	-	-	-
	BH5	1	1	-	-	-	-
	BH6	-	-	1	-	-	1
	BH7	-	-	1	-	-	1
	BH8	-	-	1	-	-	1
	BH9	-	-	1	-	-	1
	Dup1	-	-	-	-	-	2

Borehole / MW		M & I	PHC	OCP	F1/BTEX	pH	Metals
GW	MW 1	1	1	-	-	-	-
	MW 2	1	1	-	-	-	-
	MW3	1	1	-	-	-	-
	MW4	-	1	-	-	-	1
	MW5	-	1	-	-	-	1
	WDups	-	-	-	-	-	1
	Trip Blank	-	-	-	1	-	-

5) SOIL AND GROUNDWATER SAMPLING PROCEDURES

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

7.2.2) Drilling Rig Decontamination

Geoprobe

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

CME 55

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

In addition, the 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.

7.2.3) Sample Logging and Field Screening

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

7.2.4) Field Screening and Calibration Procedures

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

The organic vapour readings are measured using a portable RKI Eagle gas detector, TYPE 101 (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%.

7.2.5) Soil Sampling

The soil from the disposable sampler liner is handled using new disposable gloves in order to avoid the risk of cross-contamination between the samples. Sufficient amounts of the soil samples are placed into clean glass jars with Teflon lined lids for analyses for Polychlorinated

Biphenyls, Polyaromatic Hydrocarbons, moisture content, medium to heavy PHCs, and Metals and Inorganics.

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

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

i. Field Blanks: Field blank samples for VOCs analysis are prepared to confirm that no contamination takes place during the soil sampling procedure.
ii. 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 and Groundwater Sampling**

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

Soil Engineers Ltd.
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APPENDIX 'B'

BOREHOLE LOGS

REFERENCE NO. 1708-E004

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 1

FIGURE NO.: 1

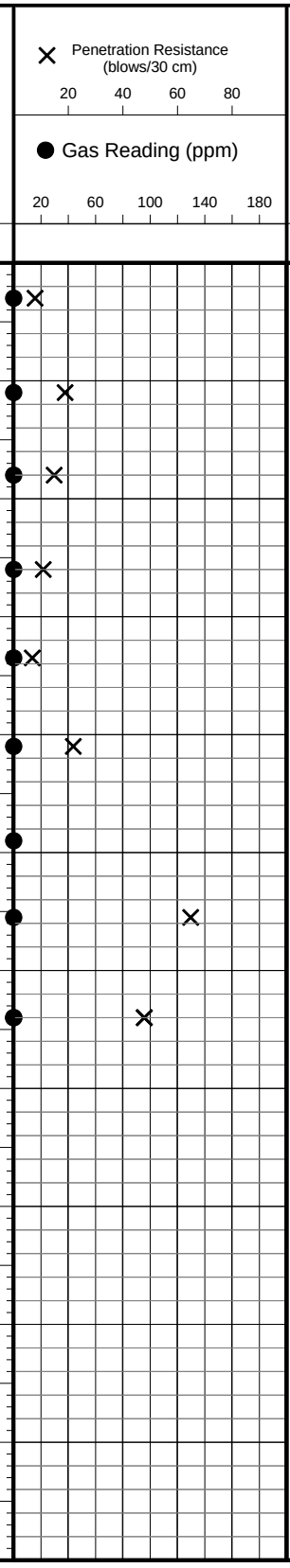
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: September 1, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
269.93	Ground Surface						
0.0	**25 cm TOPSOIL**						
	Brown, moist **SILTY SAND, FILL**	1	DO	0	8	0	BH1/1: M&I, OCP Dup-2: Metals
269.1							
0.8	Brown, moist **SILT** a trace of clay	2	DO	0	19	1	
		3	DO	0	15	2	
		4	DO	0	11		
		5	DO	0	7	3	
	brown / grey	6	DO	0	22	4	
	moist / wet	7	DO	0		5	BH1/7: PHC, pH
264.6							
5.3	Grey, wet	8	DO	0	65		
	SANDY SILT	9	DO	0	48	6	
263.2							
6.7	END OF BOREHOLE Installed 51 mm standpipe to 6.1 m. Bentonite seal from 0.15 to 2.2 m. Sand backfill from 2.2 to 6.1 m. 3 m screen from 3.1 to 6.1 m. Provided with flushmount protective casing.					7 8 9 10 11	



WATER LEVEL

W.L. @ 2.64 mbgs on September 19, 2017

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 2

FIGURE NO.: 2

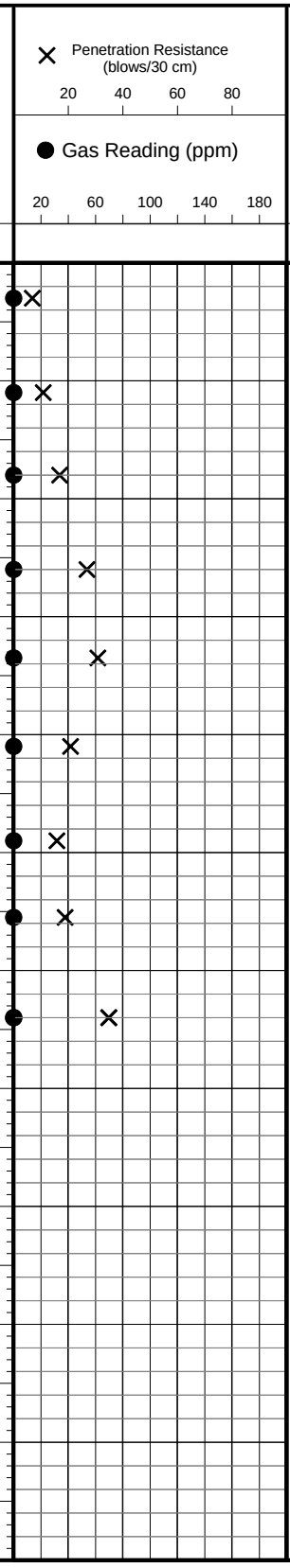
PROJECT DESCRIPTION: Existing Residential Property

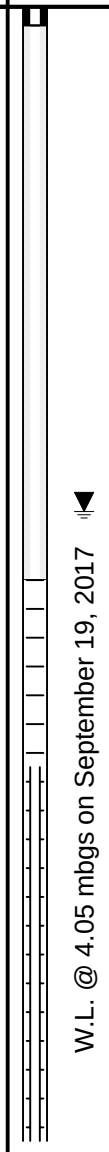
METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: August 31, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
272.19	Ground Surface						
0.0	**20 cm TOPSOIL**					0	
	Brown, moist	1	DO	0	7		BH2/1: M&I, OCP, PHC
271.4	**SANDY SILT, FILL**						
0.8		2	DO	0	11	1	
		3	DO	0	17	2	
	SILTY CLAY	4	DO	0	27		
		5	DO	0	31	3	
	brown / grey	6	DO	0	21	4	
	moist / wet	7	DO	0	16	5	
		8	DO	0	19		
						6	
		9	DO	0	35		
265.5 / 6.7	6.7 - 9.2 mbgs Augered for monitoring well installation					7	
						8	
						9	
9.2	END OF BOREHOLE Installed 51 mm standpipe to 9.1 m. Bentonite seal from 0.15 to 4.6 m. Sand backfill from 4.6 to 9.1 m. 3 m screen from 6.1 to 9.1 m. Provided with flushmount protective casing.					10	
						11	





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JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 3

FIGURE NO.: 3

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: August 31, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
272.81	Ground Surface						
0.0	**10 cm GRAVEL**	1	DO	0	4	0	BH3/1: M&I
	Brown, moist **SILTY CLAY, FILL**						
272.0 / 0.8	Firm	2	DO	0	3	1	
		3	DO	0	19	2	
	SILTY CLAY — moist / wet	4	DO	0	20		
		5	DO	0	15	3	
		6	DO	0	38	4	
		7A	DO	0	32		
		7B	DO	0		5	BH3/7B: PHC
	— brown / grey	8	DO	0	27		
						6	
266.1 / 6.7		9	DO	0			
	END OF BOREHOLE Installed 51 mm standpipe to 6.1 m. Bentonite seal from 0.15 to 2.4 m. Sand backfill from 2.4 to 6.1 m. 3 m screen from 3.1 to 6.1 m. Provided with flushmount protective casing.					7	
						8	
						9	
						10	
						11	

Penetration Resistance (blows/30 cm): 20 40 60 80

Gas Reading (ppm): 20 60 100 140 180

WATER LEVEL

W.L. @ 3.45 on September 19, 2017

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 4

FIGURE NO.: 4

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: August 31, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
271.64	Asphaltic Concrete						
0.0	**13 cm CONCRETE**						
	Brown, moist, soft **SILTY CLAY**	1	DO	0		0	BH4/1: M&I Dup-1: Metals
		2	DO	0		1	
		3	DO	0			
269.8 1.8	Brown, moist, firm	4A	DO	0		2	
269.5 2.1	**SILTY CLAY, TILL** Brown, wet, firm	4B	DO	0			
		5	DO	5		3	BH4/5: PHC
	SILTY CLAY	6	DO	5			
267.9 3.7	END OF BOREHOLE Installed 51 mm standpipe to 3.7 m. Concrete from 0.0 to 0.3 m. Bentonite seal from 0.3 to 0.8 m. Sand backfill from 0.8 to 3.7 m. 2.3 m screen from 1.4 to 3.7 m. Provided with flushmount protective casing.					4 5 6 7 8 9 10 11	

Penetration Resistance (blows/30 cm): 20 40 60 80

Gas Reading (ppm): 20 60 100 140 180

WATER LEVEL

W.L. @ 2.41 mbgs on September 19, 2017

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 5

FIGURE NO.: 5

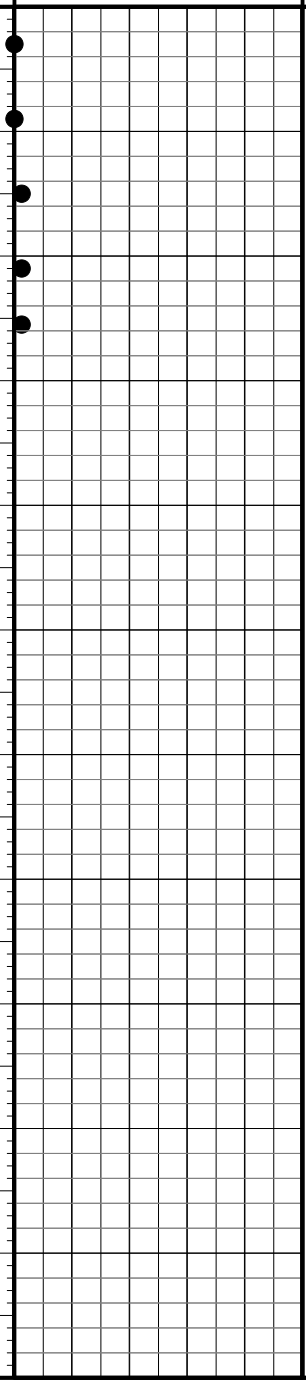
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: August 31, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
271.99	Asphaltic Concrete						
0.0	**13 cm CONCRETE**						
	Brown, damp to moist, firm	1	DO	0		0	BH5/1: M&I
		2	DO	0		1	
	SILTY CLAY	3	DO	5			BH5/3: PHC
		4	DO	5		2	
		5	DO	5			
269.1 / 2.9	END OF BOREHOLE Installed 51 mm standpipe to 2.9 m. Concrete from 0.0 to 0.3 m. Bentonite seal from 0.3 to 0.8 m. Sand backfill from 0.8 to 2.9 m. 1.5 m screen from 1.4 to 2.9 m. Provided with flushmount protective casing.					3 4 5 6 7 8 9 10 11	



WATER LEVEL

W.L. @ 2.75 mbgs on September 19, 2017

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 6

FIGURE NO.: 6

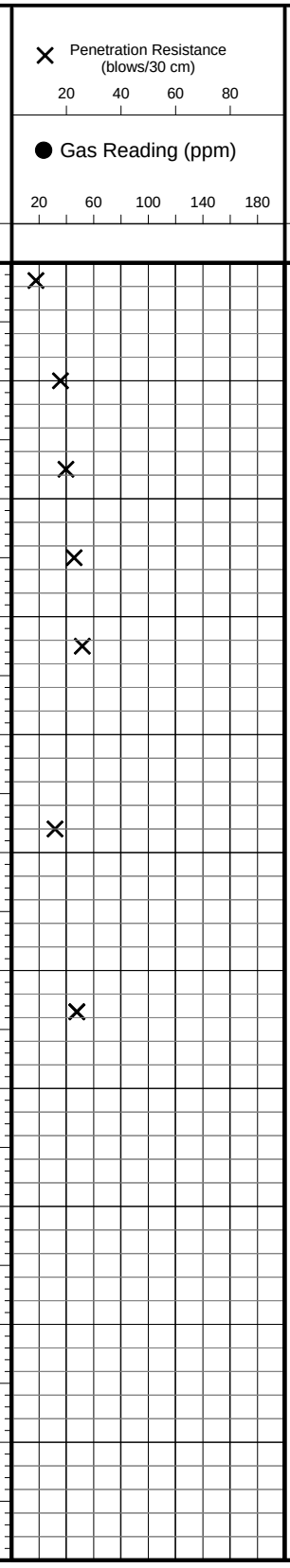
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: September 1, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
271.34	Ground Surface							
0.0	**38 cm TOPSOIL**	1A	DO		9	0		
	Brown	1B	DO				BH6/1B: Metals, OCP	
		2	DO		18	1		
	SILT some clay and sand seams	3	DO		20	2		
		4	DO		23			
		5	DO		26	3		
267.3 4.0	Grey					4		
	SILTY CLAY	6	DO		16	5		
		7	DO		24	6		
264.7 6.6	END OF BOREHOLE					7		
						8		
						9		
						10		
						11		



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JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 7

FIGURE NO.: 7

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: September 1, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
270.81	Ground Surface								
0.0	**38 cm TOPSOIL**	1A	DO		5	0			
	Brown	1B	DO					BH7/1: Metals, OCP	
		2	DO		9	1			
	SILT some clay and sand seams	3	DO		17	2			
		4	DO		22				
		5	DO		17	3			
						4			
		6	DO		25	5			
						6			
264.2		7	DO		54				
6.6	END OF BOREHOLE					7			
						8			
						9			
						10			
						11			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 8

FIGURE NO.: 8

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: September 1, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Ground Surface								
0.0	**36 cm TOPSOIL**	1A	DO		4	0			
	Brown	1B	DO					BH8/1: Metals, OCP	
		2	DO		20	1			
	SILT some clay and sand seams	3	DO		25	2			
		4	DO		30				
		5	DO		43	3			
						4			
4.6	Grey	6	DO		30	5			
	SILTY CLAY					6			
		7	DO		31				
6.6	END OF BOREHOLE					7			
						8			
						9			
						10			
						11			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 9

FIGURE NO.: 9

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Bomb

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: September 1, 2017

El. (masl) / Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
264.59	Ground Surface								
0.0	**43 cm TOPSOIL**	1A	DO		3	0			
	Brown	1B	DO					BH9/1: Metals, OCP	
		2	DO		16	1			
	SILT some clay and sand seams	3	DO		15	2			
		4	DO		23				
		5	DO		33	3			
260.6 / 4.0	Grey					4			
	SILTY CLAY	6	DO		25	5			
		7	DO		23	6			
258.0 / 6.6	END OF BOREHOLE					7			
						8			
						9			
						10			
						11			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 10

FIGURE NO.: 10

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Ground Surface								
0.0	**15 cm TOPSOIL**	1A	TO			0			
0.1	Dark Brown **SILTY CLAY, FILL** topsoil inclusions	1B	TO						
		2	TO			1		BH10/2: Metals	
1.2	END OF BOREHOLE					2			
						3			
						4			
						5			
						6			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 11

FIGURE NO.: 11

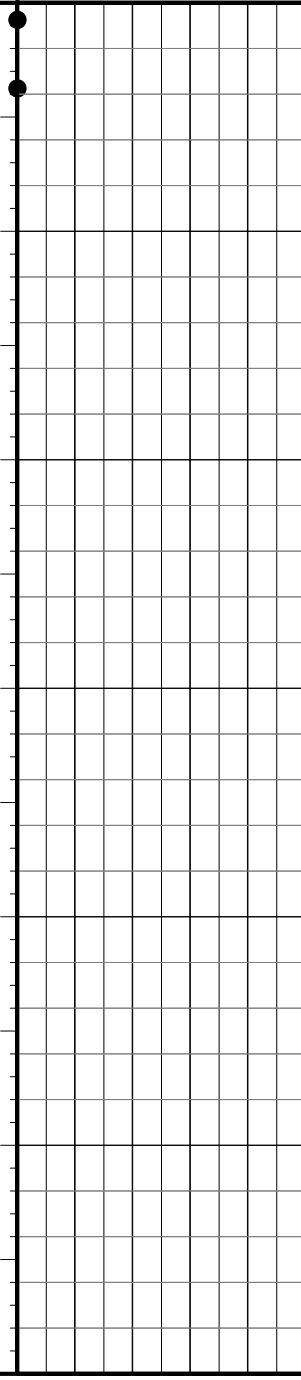
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
0.00	Ground Surface							
0.0	**15 cm TOPSOIL**	1A		0		0		
0.1	**SILTY CLAY**	1B		0			BH11/1B: Metals	
0.6	END OF BOREHOLE							



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JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 12

FIGURE NO.: 12

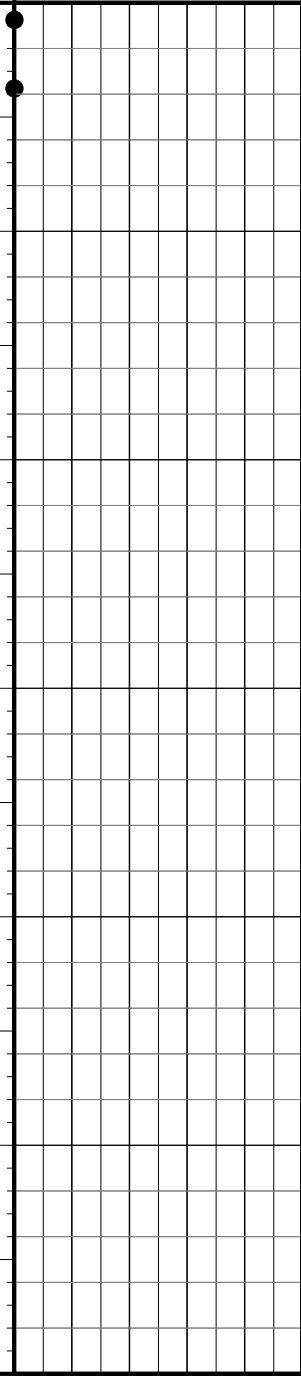
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
0.00	Ground Surface							
0.0	**36 cm TOPSOIL**	1A		0		0		
0.1	Brown **SILTY CLAY**	1B		0			BH12/1B: Metals	
0.6	END OF BOREHOLE					1		
						2		
						3		
						4		
						5		
						6		



Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 13

FIGURE NO.: 13

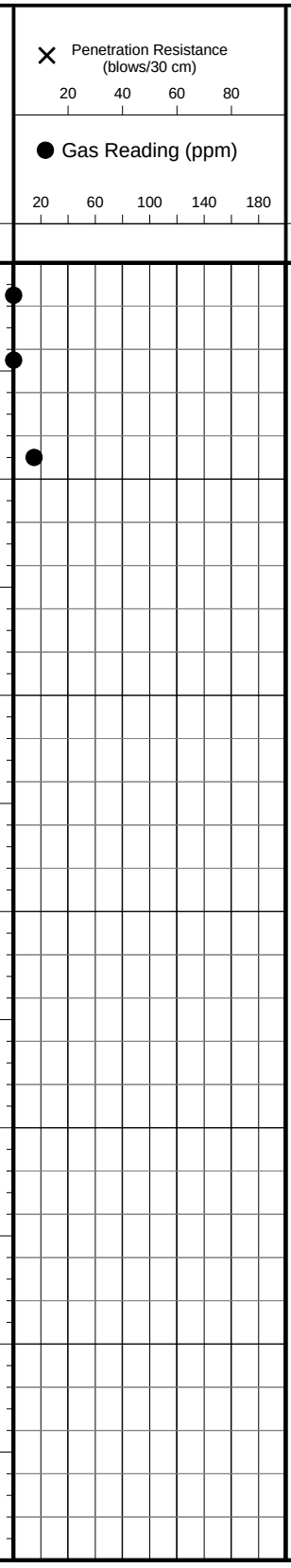
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
0.00	Ground Surface							
0.0	**30 cm TOPSOIL**	1A		0		0		
0.3	Brown **SILTY CLAY, FILL**	1B		0				
0.6	Brown **SILTY CLAY**	2		15		1	BH13/2: Dup-S1: Metals	
1.2	END OF BOREHOLE					2		
						3		
						4		
						5		
						6		



Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 14

FIGURE NO.: 14

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
0.00	Ground Surface							
0.0	**15 cm TOPSOIL**	1A		0		0		
0.1	Brown **SILTY CLAY**	1B		0			BH14/1B: Metals	
0.6	END OF BOREHOLE							

Penetration Resistance (blows/30 cm): 20 40 60 80

Gas Reading (ppm): 20 60 100 140 180

Depth Scale (mbgs): 0 1 2 3 4 5 6

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 15

FIGURE NO.: 15

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS	WATER LEVEL
0.00	Gravel							
0.0	**15 cm GRAVEL**					0		
0.1	Dark Brown	1A		0				
0.3	**SILTY CLAY, FILL** topsoil inclusions	1B		0				
	Brown **SILTY CLAY, TILL** some sand seams @ 1.2 m	2		0		1	BH15/2: Metals	
1.2	END OF BOREHOLE					2 3 4 5 6		

Penetration Resistance (blows/30 cm): 20 40 60 80

Gas Reading (ppm): 20 60 100 140 180

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 16

FIGURE NO.: 16

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Ground Surface								
0.0	**45 cm TOPSOIL**	1A		0		0			
0.5	Brown	1B		0				BH16/1B: Metals	
0.6	**SILTY CLAY**								
	END OF BOREHOLE					1			
						2			
						3			
						4			
						5			
						6			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 17

FIGURE NO.: 17

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Ground Surface								
0.0	**30 cm TOPSOIL**	1A		0		0			
0.3	Brown **SILTY CLAY**	1B		0				BH17/1B: Metals	
0.6	END OF BOREHOLE					1			
						2			
						3			
						4			
						5			
						6			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 18

FIGURE NO.: 18

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Ground Surface								
0.0	**30 cm TOPSOIL**	1A				0		BH18/1B: Metals	
0.3	Brown **SILTY CLAY**	1B							
0.6	END OF BOREHOLE					1			
						2			
						3			
						4			
						5			
						6			

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 19

FIGURE NO.: 19

PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	Penetration Resistance (blows/30 cm) 20 40 60 80 / Gas Reading (ppm) 20 60 100 140 180	REMARKS	WATER LEVEL
0.00	Gravel								
0.0	**46 cm GRAVEL**					0			
0.1	Brown **SILTY CLAY, FILL** some roots and topsoil	1		0					
0.8	Brown, moist **SILTY CLAY**	2		0		1			
		3				2			
		4							
		5		30		3			
		6				4		470 BH19/6: PHC	
4.6	END OF BOREHOLE Installed 51 mm standpipe to 4.6 m. Concrete from 0.0 to 0.15 m. Bentonite seal from 0.15 to 0.9 m. Sand backfill from 0.9 to 4.6 m. 3 m screen from 1.5 to 4.6 m. Provided with flushmount protective casing.					5 6			W.L. @ 3.83 mbgs on October 10, 2017

Soil Engineers Ltd.

JOB NO.: 1708-E004

LOG OF BOREHOLE NO.: 20

FIGURE NO.: 20

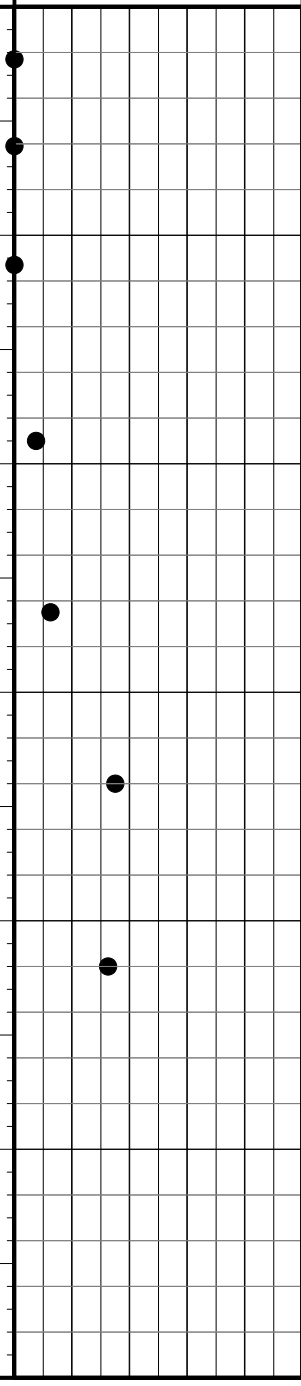
PROJECT DESCRIPTION: Existing Residential Property

METHOD OF BORING: Pionjar

PROJECT LOCATION: 16780 Yonge Street
Town of Newmarket

DRILLING DATE: October 10, 2017

El. (masl) Depth (mbgs)	SOIL DESCRIPTION	SAMPLES Number	Type	Gas Reading	N-Value	Depth Scale (mbgs)	REMARKS
0.00	Gravel with some soil						
0.0	**46 cm GRAVEL**	1A		0		0	
0.5	Brown, moist **SILTY CLAY, FILL** with topsoil	1B		0			
0.8	Brown, moist **SILTY CLAY**	2		0		1	
		3		15		2	
		4		25		3	
		5		70			BH20/5: PHC
3.8	3.8 - 4.6 mbgs Augered for monitoring welll installation	6		65		4	
4.6	END OF BOREHOLE Installed 51 mm standpipe to 4.6 m. Bentonite seal from 0.3 to 0.9 m. Sand backfill from 0.9 to 4.6 m. 3 m screen from 1.5 to 4.6 m. Provided with flushmount protective casing.					5 6	



Soil Engineers Ltd.

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL (416) 754-8515 · FAX (905) 881-8335

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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 'C'

CERTIFICATE OF ANALYSIS (SOIL SAMPLES)

REFERENCE NO. 1708-E004

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

CLIENT NAME: **SOIL ENGINEERS LIMITED**
90 WEST BEAVER CREEK ROAD, UNIT 100
RICHMOND HILL , ON L4B 1E7
(416) 754-8515

ATTENTION TO: **Efua Khumbah**

PROJECT: **1708-E004**

AGAT WORK ORDER: **17T257803**

SOIL ANALYSIS REVIEWED BY: **Nivine Basily, Inorganics Report Writer**

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

DATE REPORTED: **Sep 20, 2017**

PAGES (INCLUDING COVER): **11**

VERSION*: **1**

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

*NOTES

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

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

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

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

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

DATE RECEIVED: 2017-09-05 **DATE REPORTED: 2017-09-20**

		SAMPLE DESCRIPTION:		BH1/1	BH2/1	BH3/1	BH4/1	BH5/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-09-01	2017-08-31	2017-08-31	2017-08-31	2017-08-31
Parameter	Unit	G / S	RDL	8700451	8700461	8700465	8700468	8700479
Antimony	µg/g	1.3	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	18	10	6	4	4
Barium	µg/g	220	2	52	101	74	50	53
Beryllium	µg/g	2.5	0.5	<0.5	0.5	<0.5	<0.5	<0.5
Boron	µg/g	36	5	7	6	6	5	6
Boron (Hot Water Soluble)	µg/g	1.5	0.10	0.62	0.36	0.27	<0.10	<0.10
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	70	2	12	16	13	11	13
Cobalt	µg/g	22	0.5	4.0	6.0	5.0	4.7	5.9
Copper	µg/g	92	1	18	19	14	14	15
Lead	µg/g	120	1	**124**	**344**	**214**	8	7
Molybdenum	µg/g	2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/g	82	1	9	15	11	11	14
Selenium	µg/g	1.5	0.4	0.4	0.6	<0.4	<0.4	<0.4
Silver	µg/g	0.5	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/g	86	1	20	25	22	21	23
Zinc	µg/g	290	5	65	**402**	72	30	33
Chromium VI	µg/g	0.66	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide	µg/g	0.051	0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Mercury	µg/g	0.27	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Electrical Conductivity	mS/cm	0.7	0.005	0.187	0.149	0.128	0.154	0.114
Sodium Adsorption Ratio	NA	5	NA	0.061	0.042	0.115	1.27	0.287
pH, 2:1 CaCl2 Extraction	pH Units		NA	7.24	7.73	7.52	7.72	7.86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8700451-8700479 EC & SAR were determined on the DI water extract obtained from the 2:1 leaching procedure (2 parts DI water:1 part soil). pH was determined on the 0.01M CaCl2 extract prepared at 2:1 ratio.

Certified By: Divine Basily

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

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

DATE RECEIVED: 2017-09-05 **DATE REPORTED: 2017-09-20**

		SAMPLE DESCRIPTION:		DUP 1	DUP 2	BH6/1	BH7/1	BH8/1	BH9/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-08-31	2017-09-01	2017-09-01	2017-09-01	2017-09-01	2017-09-01
Parameter	**Unit**	**G / S**	**RDL**	**8700484**	**8700495**	**8700502**	**8700504**	**8700506**	**8700508**
Antimony	µg/g	1.3	0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Arsenic	µg/g	18	1	4	10	3	4	4	3
Boron	µg/g	36	5	6	7	7	6	<5	<5
Barium	µg/g	220	2	50	60	63	77	57	77
Beryllium	µg/g	2.5	0.5	<0.5	<0.5	<0.5	0.6	<0.5	0.5
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	70	2	12	13	15	18	15	17
Cobalt	µg/g	22	0.5	5.9	4.7	5.1	6.7	5.2	6.5
Copper	µg/g	92	1	14	20	13	18	13	15
Lead	µg/g	120	1	7	105	15	15	23	9
Molybdenum	µg/g	2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/g	82	1	13	11	12	18	12	17
Selenium	µg/g	1.5	0.4	<0.4	0.5	<0.4	<0.4	0.5	<0.4
Silver	µg/g	0.5	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/g	86	1	24	19	25	33	27	32
Zinc	µg/g	290	5	31	67	42	46	49	40

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: Divine Basily

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

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

DATE RECEIVED: 2017-09-05 **DATE REPORTED: 2017-09-20**

		SAMPLE DESCRIPTION:		**BH1/7**
		SAMPLE TYPE:		**Soil**
		DATE SAMPLED:		**2017-09-01**
Parameter	**Unit**	**G / S**	**RDL**	**8700453**
pH, 2:1 CaCl2 Extraction	pH Units		NA	7.67

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8700453 pH was determined on the 0.01M CaCl2 extract obtained from 2:1 leaching procedure (2 parts extraction fluid:1 part wet soil).

Certified By: Divine Basily

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

O. Reg. 153(511) - OC Pesticides (Soil)

DATE RECEIVED: 2017-09-05 **DATE REPORTED: 2017-09-20**

		SAMPLE DESCRIPTION:		BH1/1	BH2/1	BH6/1	BH7/1	BH8/1	BH9/1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-09-01	2017-08-31	2017-09-01	2017-09-01	2017-09-01	2017-09-01
Parameter	**Unit**	**G / S**	**RDL**	**8700451**	**8700461**	**8700502**	**8700504**	**8700506**	**8700508**
Hexachloroethane	µg/g	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Gamma-Hexachlorocyclohexane	µg/g	0.01	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor	µg/g	0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aldrin	µg/g	0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Heptachlor Epoxide	µg/g	0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan	µg/g	0.04	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlordane	µg/g	0.05	0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
DDE	µg/g	0.05	0.007	<0.007	0.024	<0.007	<0.007	<0.007	<0.007
DDD	µg/g	0.05	0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007
DDT	µg/g	1.4	0.007	<0.007	0.032	<0.007	<0.007	<0.007	<0.007
Dieldrin	µg/g	0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endrin	µg/g	0.04	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Methoxychlor	µg/g	0.05	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobenzene	µg/g	0.02	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Hexachlorobutadiene	µg/g	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Moisture Content	%		0.1	12.5	7.5	21.3	16.1	27.1	15.2
Surrogate	**Unit**	**Acceptable Limits**							
TCMX	%	50-140		70	66	60	72	76	68
Decachlorobiphenyl	%	60-130		72	76	86	94	90	80

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8700451-8700508 Results are based on the dry weight of the soil.
Note: DDT applies to the total of op'DDT and pp'DDT, DDD applies to the total of op'DDD and pp'DDD and DDE applies to the total of op'DDE and pp'DDE. Endosulfan applies to the total of Endosulfan I and Endosulfan II.
Chlordane applies to the total of Alpha-Chlordane and Gamma-Chlordane.

Certified By:

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

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

DATE RECEIVED: 2017-09-05 **DATE REPORTED: 2017-09-20**

		SAMPLE DESCRIPTION:		BH1/7	BH2/1	BH3/7B	BH4/5	BH5/3	TP-1
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-09-01	2017-08-31	2017-08-31	2017-08-31	2017-08-31	2017-09-01
Parameter	**Unit**	**G / S**	**RDL**	**8700453**	**8700461**	**8700466**	**8700472**	**8700482**	**8700510**
Benzene	µg/g	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Toluene	µg/g	0.2	0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Ethylbenzene	µg/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Xylene Mixture	µg/g	0.05	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5	<5	<5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	25	5	<5	<5	<5	<5	<5	<5
F2 (C10 to C16)	µg/g	10	10	<10	<10	<10	<10	<10	<10
F3 (C16 to C34)	µg/g	240	50	78	<50	<50	<50	<50	88
F4 (C34 to C50)	µg/g	120	50	<50	<50	<50	<50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	120	50	NA	NA	NA	NA	NA	NA
Moisture Content	%		0.1	13.8	12.0	16.4	13.0	16.6	34.6
Surrogate	**Unit**	**Acceptable Limits**							
Terphenyl	%	60-140		80	65	71	77	91	67

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8700453-8700510 Results are based on sample dry weight.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By:

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

Guideline Violation

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

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

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8700451	BH1/1	ON T8 S RPI/ICC	O. Reg. 153(511) - Metals & Inorganics (Soil)	Lead	µg/g	120	124
8700461	BH2/1	ON T8 S RPI/ICC	O. Reg. 153(511) - Metals & Inorganics (Soil)	Lead	µg/g	120	344
8700461	BH2/1	ON T8 S RPI/ICC	O. Reg. 153(511) - Metals & Inorganics (Soil)	Zinc	µg/g	290	402
8700465	BH3/1	ON T8 S RPI/ICC	O. Reg. 153(511) - Metals & Inorganics (Soil)	Lead	µg/g	120	214

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Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

Soil Analysis

RPT Date: Sep 20, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Soil)															
Antimony	8700461	8700461	<0.8	<0.8	NA	< 0.8	110%	70%	130%	90%	80%	120%	79%	70%	130%
Arsenic	8700461	8700461	10	10	1.1%	< 1	111%	70%	130%	98%	80%	120%	82%	70%	130%
Barium	8700461	8700461	101	107	6.1%	< 2	97%	70%	130%	97%	80%	120%	71%	70%	130%
Beryllium	8700461	8700461	0.5	0.5	NA	< 0.5	77%	70%	130%	109%	80%	120%	76%	70%	130%
Boron	8700461	8700461	6	6	NA	< 5	71%	70%	130%	108%	80%	120%	86%	70%	130%
Boron (Hot Water Soluble)	8700461	8700461	0.36	0.39	NA	< 0.10	101%	60%	140%	94%	70%	130%	95%	60%	140%
Cadmium	8700461	8700461	<0.5	0.5	NA	< 0.5	97%	70%	130%	97%	80%	120%	83%	70%	130%
Chromium	8700461	8700461	16	17	1.1%	< 2	75%	70%	130%	98%	80%	120%	76%	70%	130%
Cobalt	8700461	8700461	6.0	5.9	0.7%	< 0.5	87%	70%	130%	100%	80%	120%	70%	70%	130%
Copper	8700461	8700461	19	19	0.2%	< 1	94%	70%	130%	114%	80%	120%	86%	70%	130%
Lead	8700461	8700461	344	423	20.6%	< 1	102%	70%	130%	110%	80%	120%	103%	70%	130%
Molybdenum	8700461	8700461	<0.5	<0.5	NA	< 0.5	98%	70%	130%	100%	80%	120%	85%	70%	130%
Nickel	8700461	8700461	15	15	1.0%	< 1	100%	70%	130%	108%	80%	120%	86%	70%	130%
Selenium	8700461	8700461	0.6	0.5	NA	< 0.4	102%	70%	130%	102%	80%	120%	83%	70%	130%
Silver	8700461	8700461	<0.2	<0.2	NA	< 0.2	95%	70%	130%	103%	80%	120%	79%	70%	130%
Thallium	8700461	8700461	<0.4	<0.4	NA	< 0.4	93%	70%	130%	102%	80%	120%	85%	70%	130%
Uranium	8700461	8700461	<0.5	<0.5	NA	< 0.5	94%	70%	130%	104%	80%	120%	88%	70%	130%
Vanadium	8700461	8700461	25	25	1.1%	< 1	94%	70%	130%	110%	80%	120%	78%	70%	130%
Zinc	8700461	8700461	402	417	3.6%	< 5	91%	70%	130%	108%	80%	120%	82%	70%	130%
Chromium VI	8696038		<0.2	<0.2	NA	< 0.2	97%	70%	130%	101%	80%	120%	97%	70%	130%
Cyanide	8696169		<0.040	<0.040	NA	< 0.040	91%	70%	130%	104%	80%	120%	103%	70%	130%
Mercury	8700461	8700461	<0.10	<0.10	NA	< 0.10	103%	70%	130%	103%	80%	120%	78%	70%	130%
Electrical Conductivity	8700461	8700461	0.149	0.159	6.5%	< 0.005	95%	90%	110%						
Sodium Adsorption Ratio	8700461	8700461	0.042	0.036	15.4%	NA									
pH, 2:1 CaCl2 Extraction	8698497		8.65	8.60	0.6%	NA	101%	80%	120%						

Comments:

O. Reg. 153(511) - ORPs (Soil)									
pH, 2:1 CaCl2 Extraction	8698497	8.65	8.60	0.6%	NA	101%	90%	110%	

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

Certified By: Divine Basily

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

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AGAT Laboratories

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http://www.agatlabs.com

Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

PROJECT: 1708-E004

SAMPLING SITE:

AGAT WORK ORDER: 17T257803

ATTENTION TO: Efua Khumbah

SAMPLED BY:PC, JS

Trace Organics Analysis

RPT Date: Sep 20, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - OC Pesticides (Soil)															
Hexachloroethane	8700508	8700508	< 0.01	< 0.01	NA	< 0.01	108%	50%	140%	62%	50%	140%	82%	50%	140%
Gamma-Hexachlorocyclohexane	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	84%	50%	140%	74%	50%	140%
Heptachlor	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	96%	50%	140%	74%	50%	140%	68%	50%	140%
Aldrin	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	72%	50%	140%	88%	50%	140%
Heptachlor Epoxide	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	107%	50%	140%	74%	50%	140%	84%	50%	140%
Endosulfan	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	76%	50%	140%	84%	50%	140%
Chlordane	8700508	8700508	< 0.007	< 0.007	NA	< 0.007	105%	50%	140%	82%	50%	140%	82%	50%	140%
DDE	8700508	8700508	< 0.007	< 0.007	NA	< 0.007	108%	50%	140%	93%	50%	140%	86%	50%	140%
DDD	8700508	8700508	< 0.007	< 0.007	NA	< 0.007	109%	50%	140%	84%	50%	140%	96%	50%	140%
DDT	8700508	8700508	< 0.007	< 0.007	NA	< 0.007	100%	50%	140%	91%	50%	140%	86%	50%	140%
Dieldrin	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	105%	50%	140%	82%	50%	140%	82%	50%	140%
Endrin	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	102%	50%	140%	86%	50%	140%	78%	50%	140%
Methoxychlor	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	95%	50%	140%	98%	50%	140%	94%	50%	140%
Hexachlorobenzene	8700508	8700508	< 0.005	< 0.005	NA	< 0.005	93%	50%	140%	76%	50%	140%	82%	50%	140%
Hexachlorobutadiene	8700508	8700508	< 0.01	< 0.01	NA	< 0.01	116%	50%	140%	60%	50%	140%	76%	50%	140%
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	8696039		< 0.02	< 0.02	NA	< 0.02	82%	60%	130%	90%	60%	130%	105%	60%	130%
Toluene	8696039		< 0.08	< 0.08	NA	< 0.08	83%	60%	130%	85%	60%	130%	97%	60%	130%
Ethylbenzene	8696039		< 0.05	< 0.05	NA	< 0.05	88%	60%	130%	85%	60%	130%	96%	60%	130%
Xylene Mixture	8696039		< 0.05	< 0.05	NA	< 0.05	92%	60%	130%	87%	60%	130%	97%	60%	130%
F1 (C6 to C10)	8696039		< 5	< 5	NA	< 5	75%	60%	130%	88%	85%	115%	73%	70%	130%
F2 (C10 to C16)	8700436		< 10	< 10	NA	< 10	99%	60%	130%	98%	80%	120%	96%	70%	130%
F3 (C16 to C34)	8700436		< 50	< 50	NA	< 50	101%	60%	130%	100%	80%	120%	96%	70%	130%
F4 (C34 to C50)	8700436		< 50	< 50	NA	< 50	96%	60%	130%	94%	80%	120%	91%	70%	130%

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

Certified By:

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Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T257803

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:PC, JS

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

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CANADA L4Z 1Y2
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Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED | **AGAT WORK ORDER: 17T257803**

PROJECT: 1708-E004 | **ATTENTION TO: Efua Khumbah**

SAMPLING SITE: | **SAMPLED BY:PC, JS**

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Hexachloroethane	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Gamma-Hexachlorocyclohexane	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Heptachlor	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Aldrin	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Heptachlor Epoxide	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Endosulfan	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Chlordane	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
DDE	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
DDD	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
DDT	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Dieldrin	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Endrin	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Methoxychlor	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Hexachlorobenzene	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Hexachlorobutadiene	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
TCMX	ORG-91-5112	EPA SW-846 3541,3620 & 8081	GC/ECD
Decachlorobiphenyl	ORG-91-5113	EPA SW-846 3541,3620 & 8081	GC/ECD
Moisture Content		MOE E3139	BALANCE
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID

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AGAT Laboratories

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 17T257803

Cooler Quantity: 1 2 3

Arrival Temperatures: 4.8 | 4.5 | 4.3 / 2.6 | 3.3 | 3

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: Soil Engineers Ltd.
Contact: Efua
Address: 90 West Beaver Creek Unit 100, Richmond Hill
Phone: 416 754 8515 Fax:
Reports to be sent to:
1. Email: ekhumbah@soilengineersltd.com
2. Email: paul.coulson@soilengineersltd.com

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☑ Regulation 153/04
Table 1 (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture (Check One)
☐ Coarse
☐ Fine

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

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

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

Report Guideline on Certificate of Analysis ☑ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 1708-E004
Site Location:
Sampled By: PC, JS
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (exc. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	Metals Reg 153	Metals P1				
BH1/1	Sept 1	10	2	S			X									X									
BH1/7	Sept 1	10	2										X							X					
BH2/1	Aug 31	14:00	4				X						X			X									
BH3/1		11	1				X																		
BH3/7B		11	2										X												
BH4/1		14:00	1				X																		
BH4/5		14:00	2										X												
BH5/1		16:00	1				X																		
BH5/3		16:00	2										X												
DUP 1		16:00	1																	X					
DUP 2	Sept 1	10:00	1																	X					

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Janet	Sept 5	10:45		2017/9/5	10:46
	2017/9/5	3:30			

Page 1 of 2

No: T 057321

AGAT Laboratories

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #:

Cooler Quantity: 1 cooler

Arrival Temperatures:

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: SEL
Contact: Eve
Address: 90 West Beaver Creek Unit 100
Richmond Hill
Phone: 416 754 8515 Fax:
Reports to be sent to:
1. Email: elchumbah
2. Email: Paul. Carlson.

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☑ Regulation 153/04
Table 1 *Indicate One*
☐ Ind/Com
☐ Res/Park
☐ Agriculture
Soil Texture *(Check One)*
☐ Coarse
☐ Fine

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

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

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

Report Guideline on Certificate of Analysis ☑ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 1708 - Eoc 4
Site Location:
Sampled By: PC, JS
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	Metals (Reg 153)				
BH 6/1	Sept 1	2:40	2	S													X			X					
BH 7/1	↓	10:44	2	↓													X			X					
BH 8/1	↓	11:44	2	↓													X			X					
BH 9/1	↓	1:10	2	↓													X			X					

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Janet	Sept 5	10:45	Rou	2017/9/5	10:46
Rou	2017/9/5	3:30			

Page 2 of 2

Nº: T 056602

Document ID: DIV-76-1111-014

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

Date Issued: February 22, 2017

AGAT Laboratories

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 17T257803

Cooler Quantity:

Arrival Temperatures: 4.2 4 8.5 3.3

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: SEL
Contact: Efua
Address: 90 West Beaver Creek
Richmond Hill
Phone: 416 754 8515 Fax:
Reports to be sent to:
1. Email: dchumbah@soilengineersltd.com
2. Email: Paul_Coulson@soilengineersltd.com

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☑ Regulation 153/04
Table 1 (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture

Soil Texture (Check One)
☐ Coarse
☐ Fine

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

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

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

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

Turnaround Time (TAT) Required:

Regular TAT ☑ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 1708-E004
Site Location:
Sampled By: PC
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☑ No ☐

Company:
Contact:
Address:
Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides))	ORPs: ☐ B-HWS ☐ Cl- ☐ CN ☐ Cr6+ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4 + BTEX	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
TP-1	Sept 1,17	9:30	2	S	Please include as part of COC No. T 057321								X						

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Janet	Sept 5,17	12:00			
	2017/9/6	4:20		2017/9/6	

Page 1 of 1

Nº: T 057322

Pink Copy - Client 1 Yellow Copy - AGAT 1 White Copy- AGAT

Date Issued: February 22, 2017

Soil Field Duplicates - Relative Percent Differences
Metals and Inorganic Parameters

Address 16780 Yonge Street, Newmarket
Date 30-Aug-17

Location		DUP 1	BH4/1		Alert
AGAT I.D.	RDL	8700484	8700468	RPD (%)	Limit
Antimony	0.8	nd	nd	nc	30%
Arsenic	1	4.00	4.00	nc	30%
Boron	5	6.00	5.00	nc	30%
Barium	2	50.00	50.00	nc	30%
Beryllium	0.5	nd	nd	nc	30%
Cadmium	0.5	nd	nd	nc	30%
Chromium	2	12.00	11.00	9	30%
Cobalt	0.5	5.90	4.70	23	30%
Copper	1	14.00	14.00	0	30%
Lead	1	7.00	8.00	13	30%
Molybdenum	0.5	nd	nd	nc	30%
Nickel	1	13.00	11.00	17	30%
Selenium	0.4	nd	nd	nc	30%
Silver	0.2	nd	nd	nc	30%
Thallium	0.4	nd	nd	nc	30%
Uranium	0.5	nd	nd	nc	30%
Vanadium	1	24.00	21.00	nc	30%
Zinc	5	31.00	30.00	3	30%

Note:
nd - not detected; nv - no alert value; nc - not calculable, since one (or both) of the results are <5x RDL
Results shown are in ug/g (ppm).
Exceedance of alert limits is in **bold** and highlighted.

Soil Engineers Ltd.

Project No. 1708-E004

Soil Field Duplicates - Relative Percent Differences
Metals and Inorganic Parameters

Address 16780 Yonge Street, Newmarket
Date 30-Aug-17

Location		DUP 2	BH1/1		Alert
AGAT I.D.	RDL	8,700,495.00	8,700,451.00	RPD (%)	Limit
Antimony	0.8	nd	nd	nc	30%
Arsenic	1	10.00	18.00	nc	30%
Boron	5	7.00	7.00	nc	30%
Barium	2	60.00	52.00	nc	30%
Beryllium	0.5	nd	nd	nc	30%
Cadmium	0.5	nd	nd	nc	30%
Chromium	2	13.00	12.00	8.00	30%
Cobalt	0.5	4.70	4.00	16.09	30%
Copper	1	20.00	18.00	10.53	30%
Lead	1	105.00	124.00	16.59	30%
Molybdenum	0.5	nd	nd	nc	30%
Nickel	1	11.00	9.00	20.00	30%
Selenium	0.4	0.50	0.40	22.22	30%
Silver	0.2	nd	nd	nc	30%
Thallium	0.4	nd	nd	nc	30%
Uranium	0.5	nd	nd	nc	30%
Vanadium	1	19.00	20.00	nc	30%
Zinc	5	67.00	65.00	3.03	30%

Note:
nd - not detected; nv - no alert value; nc - not calculable, since one (or both) of the results are <5x RDL
Results shown are in ug/g (ppm).
Exceedance of alert limits is in **bold** and highlighted.

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

CLIENT NAME: SOIL ENGINEERS LIMITED
90 WEST BEAVER CREEK ROAD, UNIT 100
RICHMOND HILL , ON L4B 1E7
(416) 754-8515

ATTENTION TO: Efua Khumbah

PROJECT: 1708-E0064

AGAT WORK ORDER: 17T270386

SOIL ANALYSIS REVIEWED BY: Amanjot Bhela, Inorganic Coordinator

TRACE ORGANICS REVIEWED BY: Gyulhan Yalamova, Report Reviewer

DATE REPORTED: Oct 16, 2017

PAGES (INCLUDING COVER): 7

VERSION*: 1

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

*NOTES

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

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

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

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

AGAT Laboratories

5835 COOPERS AVENUE
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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-10-11

DATE REPORTED: 2017-10-16

		SAMPLE DESCRIPTION:		BH10/2	BH11/1B	BH12/1B	BH15/2	BH13/2	BH14/1B	BH16/1B	BH17/1B
		SAMPLE TYPE:		Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
		DATE SAMPLED:		2017-10-10	2017-10-10	2017-10-10	2017-10-10	2017-10-10	2017-10-10	2017-10-10	2017-10-10
Parameter	Unit	G / S	RDL	8806700	8806701	8806702	8806703	8806707	8806708	8806709	8806710
Boron	µg/g	36	5	5	5	<5	6	<5	<5	<5	<5
Barium	µg/g	220	2	72	49	55	47	38	38	30	50
Beryllium	µg/g	2.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Cadmium	µg/g	1.2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	µg/g	70	2	18	15	17	14	12	13	11	14
Cobalt	µg/g	22	0.5	6.4	5.0	5.3	5.1	4.0	5.1	3.2	4.7
Copper	µg/g	92	1	12	9	9	11	6	10	5	9
Lead	µg/g	120	1	49	5	5	14	4	5	3	4
Molybdenum	µg/g	2	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/g	82	1	10	7	7	7	4	7	4	5
Silver	µg/g	0.5	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	µg/g	86	1	26	21	25	23	19	22	19	21
Zinc	µg/g	290	5	62	25	26	30	19	24	16	23

Certified By: Amanjot Bhela

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

AGAT Laboratories

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FAX (905)712-5122
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-10-11

DATE REPORTED: 2017-10-16

		SAMPLE DESCRIPTION:		BH18/1B	DUP-S1
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-10-10	2017-10-11
Parameter	Unit	G / S	RDL	8806711	8815147
Boron	µg/g	36	5	<5	<5
Barium	µg/g	220	2	38	44
Beryllium	µg/g	2.5	0.5	<0.5	<0.5
Cadmium	µg/g	1.2	0.5	<0.5	<0.5
Chromium	µg/g	70	2	11	13
Cobalt	µg/g	22	0.5	4.0	4.5
Copper	µg/g	92	1	9	8
Lead	µg/g	120	1	13	4
Molybdenum	µg/g	2	0.5	<0.5	<0.5
Nickel	µg/g	82	1	5	5
Silver	µg/g	0.5	0.2	<0.2	<0.2
Thallium	µg/g	1	0.4	<0.4	<0.4
Uranium	µg/g	2.5	0.5	<0.5	<0.5
Vanadium	µg/g	86	1	19	22
Zinc	µg/g	290	5	24	22

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: Amanjot Bhela

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http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-10-11

DATE REPORTED: 2017-10-16

		SAMPLE DESCRIPTION:		BH19/6	BH20/5
		SAMPLE TYPE:		Soil	Soil
		DATE SAMPLED:		2017-10-10	2017-10-10
Parameter	Unit	G / S	RDL	8806704	8806705
Benzene	µg/g	0.02	0.02	<0.02	<0.02
Toluene	µg/g	0.2	0.08	<0.08	<0.08
Ethylbenzene	µg/g	0.05	0.05	<0.05	<0.05
Xylene Mixture	µg/g	0.05	0.05	<0.05	<0.05
F1 (C6 to C10)	µg/g		5	<5	<5
F1 (C6 to C10) minus BTEX	µg/g	25	5	<5	<5
F2 (C10 to C16)	µg/g	10	10	<10	<10
F3 (C16 to C34)	µg/g	240	50	<50	<50
F4 (C34 to C50)	µg/g	120	50	<50	<50
Gravimetric Heavy Hydrocarbons	µg/g	120	50	NA	NA
Moisture Content	%		0.1	13.0	13.9
Surrogate	Unit	Acceptable Limits			
Terphenyl	%	60-140		74	86

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 S RPI/ICC
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8806704-8806705 Results are based on sample dry weight.
The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and n-C34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16-C50 and are only determined if the chromatogram of the C34 - C50 hydrocarbons indicates that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6 - C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 + nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153, results are considered valid without determining the PAH contribution if not requested by the client.
Quality Control Data is available upon request.

Certified By:

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

AGAT Laboratories

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Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Soil Analysis

RPT Date: Oct 16, 2017

PARAMETER	Batch	Sample Id	DUPLICATE Dup #1	DUPLICATE Dup #2	DUPLICATE RPD	Method Blank	REFERENCE MATERIAL Measured Value	REFERENCE MATERIAL Acceptable Limits Lower	REFERENCE MATERIAL Acceptable Limits Upper	METHOD BLANK SPIKE Recovery	METHOD BLANK SPIKE Acceptable Limits Lower	METHOD BLANK SPIKE Acceptable Limits Upper	MATRIX SPIKE Recovery	MATRIX SPIKE Acceptable Limits Lower	MATRIX SPIKE Acceptable Limits Upper
O. Reg. 153(511) - Metals (Excluding Hydrides) (Soil)															
Boron	8803255		<5	<5	NA	< 5	89%	70%	130%	101%	80%	120%	75%	70%	130%
Barium	8803255		46	48	4.3%	< 2	94%	70%	130%	89%	80%	120%	92%	70%	130%
Beryllium	8803255		<0.5	<0.5	NA	< 0.5	85%	70%	130%	102%	80%	120%	90%	70%	130%
Cadmium	8803255		<0.5	<0.5	NA	< 0.5	102%	70%	130%	101%	80%	120%	102%	70%	130%
Chromium	8803255		13	14	7.4%	< 2	88%	70%	130%	98%	80%	120%	106%	70%	130%
Cobalt	8803255		8.1	8.3	2.4%	< 0.5	93%	70%	130%	100%	80%	120%	99%	70%	130%
Copper	8803255		29	30	3.4%	< 1	88%	70%	130%	107%	80%	120%	102%	70%	130%
Lead	8803255		11	12	8.7%	< 1	99%	70%	130%	98%	80%	120%	98%	70%	130%
Molybdenum	8803255		<0.5	<0.5	NA	< 0.5	94%	70%	130%	99%	80%	120%	100%	70%	130%
Nickel	8803255		16	17	6.1%	< 1	94%	70%	130%	101%	80%	120%	98%	70%	130%
Silver	8803255		<0.2	<0.2	NA	< 0.2	78%	70%	130%	96%	80%	120%	91%	70%	130%
Thallium	8803255		<0.4	<0.4	NA	< 0.4	90%	70%	130%	94%	80%	120%	95%	70%	130%
Uranium	8803255		<0.5	<0.5	NA	< 0.5	91%	70%	130%	95%	80%	120%	99%	70%	130%
Vanadium	8803255		19	20	5.1%	< 1	90%	70%	130%	94%	80%	120%	100%	70%	130%
Zinc	8803255		52	54	3.8%	< 5	97%	70%	130%	109%	80%	120%	110%	70%	130%

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

Certified By: Amanjot Bhela

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

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FAX (905)712-5122
http://www.agatlabs.com

Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 16, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Soil)															
Benzene	8802861		< 0.02	< 0.02	NA	< 0.02	106%	60%	130%	115%	60%	130%	116%	60%	130%
Toluene	8802861		< 0.08	< 0.08	NA	< 0.08	99%	60%	130%	115%	60%	130%	111%	60%	130%
Ethylbenzene	8802861		< 0.05	< 0.05	NA	< 0.05	101%	60%	130%	110%	60%	130%	114%	60%	130%
Xylene Mixture	8802861		< 0.05	< 0.05	NA	< 0.05	95%	60%	130%	116%	60%	130%	114%	60%	130%
F1 (C6 to C10)	8802861		< 5	< 5	NA	< 5	75%	60%	130%	86%	85%	115%	79%	70%	130%
F2 (C10 to C16)	8806704	8806704	< 10	< 10	NA	< 10	108%	60%	130%	80%	80%	120%	70%	70%	130%
F3 (C16 to C34)	8806704	8806704	< 50	< 50	NA	< 50	113%	60%	130%	82%	80%	120%	73%	70%	130%
F4 (C34 to C50)	8806704	8806704	< 50	< 50	NA	< 50	99%	60%	130%	95%	80%	120%	92%	70%	130%

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

Certified By:

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

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

AGAT Laboratories

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

Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T270386

PROJECT: 1708-E0064

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Soil Analysis			
Boron	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Barium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Chromium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Copper	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Lead	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Nickel	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Silver	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Thallium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Uranium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Zinc	MET-93-6103	EPA SW-846 3050B & 6020A	ICP-MS
Trace Organics Analysis			
Benzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Toluene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Ethylbenzene	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
Xylene Mixture	VOL-91-5009	EPA SW-846 5035 & 8260	P & T GC/MS
F1 (C6 to C10)	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5009	CCME Tier 1 Method	P & T GC/FID
F2 (C10 to C16)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F3 (C16 to C34)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
F4 (C34 to C50)	VOL-91-5009	CCME Tier 1 Method, EPA SW846 8015	GC / FID
Gravimetric Heavy Hydrocarbons	VOL-91-5009	CCME Tier 1 Method	BALANCE
Moisture Content	VOL-91-5009	CCME Tier 1 Method	BALANCE
Terphenyl	VOL-91-5009		GC/FID

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

AGAT Laboratories

1 mel

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 17T 270386

Cooler Quantity:

Arrival Temperatures: 5.6 | 5.7 | 6.0 | 4.9 | 5.1 | 5.3

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: SEC

Contact: G Fue

Address: 90 West Beaver Creek Rd
Richmond Hill

Phone: 416 754 8575 Fax:

Reports to be sent to:

1. Email: ekhumbah@soilengineerlltd.ca
2. Email: mrinali.kakkar@soilengineerlltd.ca

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 1 *Indicate One*
☐ Ind/Com
☒ Res/Park
☐ Agriculture

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

☐ Sewer Use
☐ Sanitary
☐ Storm

Region _____ *Indicate One*

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

Indicate One

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

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 1708-G0064

Site Location:

Sampled By:

AGAT Quote #: PO:

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

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company:

Contact:

Address:

Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	Metals and Inorganics: ☐ All Metals ☒ 153 Metals (excl. Hydrides) ☐ Hydride Metals	ORPs: ☐ B-HWS ☐ Cl ☐ CN ☐ Cr^{6+} ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4 + BTEX	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use
BH 10/2	Oct 10/17		1	S			X												
BH 11/1B			1				X												
BH 12/1B			1				X												
BH 15/2			1				X												
BH 19/6			2										X						
BH 20/5			2										X						
BH 13/2	Oct 11/17		1				X												
BH 14/1B			1				X												
BH 16/1B			1				X												
BH 17/1B			1				X												
BH 18/1B			1				X												

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Mrinali Kakkar	Oct 11/17	4PM	[illegible]	10/11/17	100
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign): [illegible]	Date 10/11/17	Time 340	Samples Received By (Print Name and Sign):	Date	Time

Page 2 of 2

Nº: T 046109

Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL (416) 754-8515 · FAX (905) 881-8335

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. 1708-E004

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

CLIENT NAME: SOIL ENGINEERS LIMITED
90 WEST BEAVER CREEK ROAD, UNIT 100
RICHMOND HILL , ON L4B 1E7
(416) 754-8515

ATTENTION TO: Efua Khumbah

PROJECT: 1708-E004

AGAT WORK ORDER: 17T258470

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

WATER ANALYSIS REVIEWED BY: Yris Verastegui, Report Reviewer

DATE REPORTED: Sep 26, 2017

PAGES (INCLUDING COVER): 9

VERSION*: 1

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

*NOTES

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

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

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-09-08

DATE REPORTED: 2017-09-26

		SAMPLE DESCRIPTION:		MW1	MW2	MW3	MW4	MW5
		SAMPLE TYPE:		Water	Water	Water	Water	Water
		DATE SAMPLED:		2017-09-06	2017-09-06	2017-09-06	2017-09-07	2017-09-12
Parameter	Unit	G / S	RDL	8708101	8708112	8708121	8708130	8715989
Benzene	µg/L	5	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Toluene	µg/L	22	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Ethylbenzene	µg/L	2.4	0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Xylene Mixture	µg/L	300	0.20	<0.20	<0.20	<0.20	<0.20	<0.20
F1 (C6 to C10)	µg/L		25	<25	<25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	420	25	<25	<25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	<100	<100	<100	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500	NA	NA	NA	NA	NA
Surrogate	Unit	Acceptable Limits						
Terphenyl	%	60-140		90	93	101	86	73

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8708101-8715989 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable

Certified By: NPopnikolof

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-09-08

DATE REPORTED: 2017-09-26

		SAMPLE DESCRIPTION:		Trip Blank
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-09-06
Parameter	Unit	G / S	RDL	8708138
Benzene	µg/L	5	0.20	<0.20
Toluene	µg/L	22	0.20	<0.20
Ethylbenzene	µg/L	2.4	0.10	<0.10
Xylene Mixture	µg/L	300	0.20	<0.20
F1 (C6 to C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L	420	25	<25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8708138 The C6-C10 fraction is calculated using Toluene response factor.
Total C6-C10 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
Extraction and holding times were met for this sample.
NA = Not Applicable

Certified By: NPopnikolof

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

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Certificate of Analysis

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-09-08

DATE REPORTED: 2017-09-26

		SAMPLE DESCRIPTION:		MW1	MW2		MW3
		SAMPLE TYPE:		Water	Water		Water
		DATE SAMPLED:		2017-09-06	2017-09-06		2017-09-06
Parameter	Unit	G / S	RDL	8708101	8708112	RDL	8708121
Antimony	µg/L	6	1.0	<1.0	<1.0	1.0	<1.0
Arsenic	µg/L	25	1.0	3.5	1.0	1.0	<1.0
Barium	µg/L	1000	2.0	156	166	2.0	153
Beryllium	µg/L	4	0.5	<0.5	<0.5	0.5	<0.5
Boron	µg/L	5000	10.0	35.5	22.0	10.0	91.7
Cadmium	µg/L	2.1	0.2	<0.2	<0.2	0.2	<0.2
Chromium	µg/L	50	2.0	<2.0	<2.0	2.0	<2.0
Cobalt	µg/L	3.8	0.5	<0.5	<0.5	0.5	<0.5
Copper	µg/L	69	1.0	2.4	1.8	1.0	3.1
Lead	µg/L	10	0.5	<0.5	<0.5	0.5	1.8
Molybdenum	µg/L	70	0.5	0.8	2.5	0.5	1.6
Nickel	µg/L	100	1.0	<1.0	<1.0	1.0	<1.0
Selenium	µg/L	10	1.0	<1.0	<1.0	1.0	<1.0
Silver	µg/L	1.2	0.2	<0.2	<0.2	0.2	<0.2
Thallium	µg/L	2	0.3	<0.3	<0.3	0.3	<0.3
Uranium	µg/L	20	0.5	0.8	0.6	0.5	1.8
Vanadium	µg/L	6.2	0.4	<0.4	1.1	0.4	<0.4
Zinc	µg/L	890	5.0	<5.0	8.6	5.0	<5.0
Mercury	µg/L	0.29	0.02	<0.02	<0.02	0.02	<0.02
Chromium VI	µg/L	25	5	<5	<5	5	<5
Cyanide	µg/L	52	2	<2	<2	2	<2
Sodium	µg/L	490000	500	12000	11700	1000	96500
Chloride	µg/L	790000	500	15400	12900	1000	459000
Electrical Conductivity	uS/cm		2	579	596	2	1890
pH	pH Units		NA	8.27	8.16	NA	8.13

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8708101-8708121 Elevated RDLs indicate the degree of sample dilutions prior to analyses to keep analytes within the calibration range, reduce matrix interference and to avoid contaminating the instrument.

Certified By: Iris Verástegui

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-09-08

DATE REPORTED: 2017-09-26

		SAMPLE DESCRIPTION:		MW4	DUP	MW5 - Sept. 19th
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-09-07	2017-09-06	2017-09-19
Parameter	Unit	G / S	RDL	8708130	8708137	8742664
Barium	µg/L	1000	2.0	73.9	154	41.5
Beryllium	µg/L	4	0.5	<0.5	<0.5	<0.5
Boron	µg/L	5000	10.0	32.0	36.7	52.2
Cadmium	µg/L	2.1	0.2	<0.2	<0.2	<0.2
Chromium	µg/L	50	2.0	3.1	<2.0	<2.0
Cobalt	µg/L	3.8	0.5	<0.5	<0.5	<0.5
Copper	µg/L	69	1.0	4.0	<1.0	4.2
Lead	µg/L	10	0.5	1.6	<0.5	0.8
Molybdenum	µg/L	70	0.5	2.8	0.7	8.3
Nickel	µg/L	100	1.0	<1.0	<1.0	<1.0
Silver	µg/L	1.2	0.2	<0.2	<0.2	<0.2
Thallium	µg/L	2	0.3	<0.3	<0.3	<0.3
Uranium	µg/L	20	0.5	0.6	0.8	0.9
Vanadium	µg/L	6.2	0.4	<0.4	<0.4	1.6
Zinc	µg/L	890	5.0	8.0	<5.0	7.8

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

Certified By: Iris Verástegui

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

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Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Sep 26, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Water)															
Benzene	8675094		< 0.20	< 0.20	NA	< 0.20	87%	50%	140%	98%	60%	130%	89%	50%	140%
Toluene	8675094		< 0.20	< 0.20	NA	< 0.20	95%	50%	140%	89%	60%	130%	95%	50%	140%
Ethylbenzene	8675094		< 0.10	< 0.10	NA	< 0.10	94%	50%	140%	90%	60%	130%	87%	50%	140%
Xylene Mixture	8675094		< 0.20	< 0.20	NA	< 0.20	91%	50%	140%	98%	60%	130%	94%	50%	140%
F1 (C6 to C10)	8675094		< 25	< 25	NA	< 25	86%	60%	140%	94%	60%	140%	86%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	104%	60%	140%	61%	60%	140%	63%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	108%	60%	140%	80%	60%	140%	108%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	81%	60%	140%	95%	60%	140%	91%	60%	140%

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

Certified By: NPopnikolof

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

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

AGAT Laboratories

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

Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Water Analysis

RPT Date: Sep 26, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - Metals & Inorganics (Water)															
Antimony	8708101	8708101	<1.0	<1.0	NA	< 1.0	105%	70%	130%	93%	80%	120%	98%	70%	130%
Arsenic	8708101	8708101	3.5	3.7	NA	< 1.0	108%	70%	130%	107%	80%	120%	105%	70%	130%
Barium	8708101	8708101	156	152	2.6%	< 2.0	98%	70%	130%	98%	80%	120%	96%	70%	130%
Beryllium	8708101	8708101	<0.5	<0.5	NA	< 0.5	108%	70%	130%	108%	80%	120%	108%	70%	130%
Boron	8708101	8708101	35.5	35.9	NA	< 10.0	108%	70%	130%	105%	80%	120%	100%	70%	130%
Cadmium	8708101	8708101	<0.2	<0.2	NA	< 0.2	106%	70%	130%	102%	80%	120%	115%	70%	130%
Chromium	8708101	8708101	<2.0	<2.0	NA	< 2.0	105%	70%	130%	104%	80%	120%	100%	70%	130%
Cobalt	8708101	8708101	<0.5	<0.5	NA	< 0.5	108%	70%	130%	107%	80%	120%	101%	70%	130%
Copper	8708101	8708101	2.4	2.6	NA	< 1.0	109%	70%	130%	109%	80%	120%	101%	70%	130%
Lead	8708101	8708101	<0.5	<0.5	NA	< 0.5	102%	70%	130%	105%	80%	120%	98%	70%	130%
Molybdenum	8708101	8708101	0.8	0.8	NA	< 0.5	105%	70%	130%	102%	80%	120%	99%	70%	130%
Nickel	8708101	8708101	<1.0	<1.0	NA	< 1.0	105%	70%	130%	104%	80%	120%	96%	70%	130%
Selenium	8708101	8708101	<1.0	<1.0	NA	< 1.0	103%	70%	130%	105%	80%	120%	104%	70%	130%
Silver	8708101	8708101	<0.2	<0.2	NA	< 0.2	101%	70%	130%	104%	80%	120%	95%	70%	130%
Thallium	8708101	8708101	<0.3	<0.3	NA	< 0.3	108%	70%	130%	104%	80%	120%	102%	70%	130%
Uranium	8708101	8708101	0.8	0.8	NA	< 0.5	99%	70%	130%	98%	80%	120%	99%	70%	130%
Vanadium	8708101	8708101	<0.4	<0.4	NA	< 0.4	103%	70%	130%	101%	80%	120%	99%	70%	130%
Zinc	8708101	8708101	<5.0	<5.0	NA	< 5.0	104%	70%	130%	107%	80%	120%	100%	70%	130%
Mercury	8708101	8708101	<0.02	<0.02	NA	< 0.02	106%	70%	130%	106%	80%	120%	103%	70%	130%
Chromium VI	8708833		<5	<5	NA	< 5	105%	70%	130%	100%	80%	120%	104%	70%	130%
Cyanide	8708101	8708101	<2	<2	NA	< 2	100%	70%	130%	99%	80%	120%	87%	70%	130%
Sodium	8710363		1620	1600	NA	< 500	99%	70%	130%	100%	80%	120%	96%	70%	130%
Chloride	8705648		57500	57200	0.5%	< 100	91%	70%	130%	105%	70%	130%	110%	70%	130%
Electrical Conductivity	8707787		787	809	2.8%	< 2	109%	90%	110%						
pH	8707787		8.12	7.97	1.9%	NA	100%	90%	110%						
O. Reg. 153(511) - Metals (Excluding Hydrides) (Water)															
Barium	8742664	8742664	41.5	42.0	1.2%	< 2.0	99%	70%	130%	100%	80%	120%	92%	70%	130%
Beryllium	8742664	8742664	<0.5	<0.5	NA	< 0.5	100%	70%	130%	104%	80%	120%	106%	70%	130%
Boron	8742664	8742664	52.2	49.4	NA	< 10.0	103%	70%	130%	103%	80%	120%	91%	70%	130%
Cadmium	8742664	8742664	<0.2	<0.2	NA	< 0.2	100%	70%	130%	100%	80%	120%	104%	70%	130%
Chromium	8742664	8742664	<2.0	<2.0	NA	< 2.0	101%	70%	130%	100%	80%	120%	97%	70%	130%
Cobalt	8742664	8742664	<0.5	<0.5	NA	< 0.5	93%	70%	130%	97%	80%	120%	100%	70%	130%
Copper	8742664	8742664	4.2	4.6	NA	< 1.0	98%	70%	130%	103%	80%	120%	98%	70%	130%
Lead	8742664	8742664	0.8	0.8	NA	< 0.5	95%	70%	130%	100%	80%	120%	91%	70%	130%
Molybdenum	8742664	8742664	8.3	8.0	3.7%	< 0.5	92%	70%	130%	94%	80%	120%	93%	70%	130%
Nickel	8742664	8742664	<1.0	<1.0	NA	< 1.0	97%	70%	130%	102%	80%	120%	99%	70%	130%
Silver	8742664	8742664	<0.2	<0.2	NA	< 0.2	100%	70%	130%	108%	80%	120%	94%	70%	130%
Thallium	8742664	8742664	<0.3	<0.3	NA	< 0.3	98%	70%	130%	102%	80%	120%	93%	70%	130%
Uranium	8742664	8742664	0.9	1.0	NA	< 0.5	93%	70%	130%	97%	80%	120%	99%	70%	130%

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Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Water Analysis (Continued)

RPT Date: Sep 26, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
Vanadium	8742664	8742664	1.6	1.6	NA	< 0.4	98%	70%	130%	100%	80%	120%	101%	70%	130%
Zinc	8742664	8742664	7.8	8.5	NA	< 5.0	101%	70%	130%	107%	80%	120%	107%	70%	130%

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

Certified By: Iris Verástegui

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Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T258470

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID
Water Analysis			
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Mercury	MET-93-6100	EPA SW-846 7470 & 245.1	CVAAS
Chromium VI	INOR-93-6034	SM 3500-Cr B	SPECTROPHOTOMETER
Cyanide	INOR-93-6052	MOE METHOD CN- 3015 & SM 4500 CN- I	TECHNICON AUTO ANALYZER
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE

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AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
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webearth.agatlabs.com

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 17T258470

Cooler Quantity: new

Arrival Temperatures: 3.5 | 3.8 | 3.7
2.2 | 2.5 | 2.8

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: SEL
Contact: Efua
Address: 90 West Beaver Creek Rd
Richmond Hill
Phone: 416 754 8515 Fax:
Reports to be sent to:
1. Email: mineli.kakkar@soilengineers.ltd.ca
2. Email: e.kheumbah@soilengineers.ltd.ca

Regulatory Requirements:

☐ No Regulatory Requirement
(Please check all applicable boxes)

☒ Regulation 153/04
Table 1 *Indicate One*
☐ Ind/Com
☒ Res/Park
☐ Agriculture

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

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

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

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

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)
☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 170B-G004
Site Location:
Sampled By:
AGAT Quote #: PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Invoice Information:

Bill To Same: Yes ☐ No ☐
Company:
Contact:
Address:
Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics	All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (incl. Hydrides)	ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN⁻ ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4 + BTEX	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	F1 & TEX
MW1	Sept 6/17	12pm		GW		Y	X							X							
MW2		1pm				Y	X							X							
MW3		2pm				Y	X							X							
MW4	Sept 6/17	1:30pm				Y		X						X							
Dup	Sept 6/17					Y		X													
Trip Blank																				X	

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
				2017/09/08	12:23
	2017/9/8	2:20			

Page 1 of 1

N°: T 056604

Ground Water Field Duplicates - Relative Percent Differences
Metals and Inorganics

Address 16780 Yonge Street, Newmarket
Date 06-Sep-17

Location		**DUP**	**MW1**		Alert
AGAT I.D.	RDL	**8708137**	**8708101**	RPD (%)	Limit
Barium	2.0	154.00	156.00	1.29	0.20
Beryllium	0.5	nd	nd	nc	0.20
Boron	10.0	36.70	35.50	nc	0.20
Cadmium	0.2	nd	nd	nc	0.20
Chromium	2.0	nd	nd	nc	0.20
Cobalt	0.5	nd	nd	nc	0.20
Copper	1.0	nd	2.40	nc	0.20
Lead	0.5	nd	nd	nc	0.20
Molybdenum	0.5	0.70	0.80	nc	0.20
Nickel	1.0	nd	nd	nc	0.20
Silver	0.2	nd	nd	nc	0.20
Thallium	0.3	nd	nd	nc	0.20
Uranium	0.5	0.80	0.80	nc	0.20
Vanadium	0.4	nd	nd	nc	0.20
Zinc	5.0	nd	nd	nc	0.20

Note:
nd - not detected; nc - not calculable, since one (or both) of the results are <5x RDL
Results shown are in ug/L (ppb).
Exceedance of alert limits is in **bold**.

Soil Engineers Ltd.

Project No. 1708-e004

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

CLIENT NAME: SOIL ENGINEERS LIMITED
90 WEST BEAVER CREEK ROAD, UNIT 100
RICHMOND HILL , ON L4B 1E7
(416) 754-8515

ATTENTION TO: Efua Khumbah

PROJECT: 1708-E004

AGAT WORK ORDER: 17T270950

TRACE ORGANICS REVIEWED BY: Neli Popnikolova, Senior Chemist

DATE REPORTED: Oct 16, 2017

PAGES (INCLUDING COVER): 6

VERSION*: 1

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

*NOTES

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

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

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 17T270950

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-10-12

DATE REPORTED: 2017-10-16

		SAMPLE DESCRIPTION:		MW19	MW20	DUP-W1
		SAMPLE TYPE:		Water	Water	Water
		DATE SAMPLED:		2017-10-12	2017-10-12	2017-10-12
Parameter	Unit	G / S	RDL	8810691	8810709	8810716
Benzene	µg/L	5	0.20	0.44	0.23	0.21
Toluene	µg/L	22	0.20	1.4	1.8	1.5
Ethylbenzene	µg/L	2.4	0.10	0.34	0.24	0.18
Xylene Mixture	µg/L	300	0.20	1.3	1.5	1.1
F1 (C6 to C10)	µg/L		25	<25	<25	<25
F1 (C6 to C10) minus BTEX	µg/L	420	25	<25	<25	<25
F2 (C10 to C16)	µg/L	150	100	180	<100	<100
F3 (C16 to C34)	µg/L	500	100	<100	<100	<100
F4 (C34 to C50)	µg/L	500	100	<100	<100	<100
Gravimetric Heavy Hydrocarbons	µg/L	500	500	NA	NA	NA
Surrogate	Unit	Acceptable Limits				
Terphenyl	%	60-140		84	96	97

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8810691-8810716 The C6-C10 fraction is calculated using Toluene response factor.
The C10 - C16, C16 - C34, and C34 - C50 fractions are calculated using the average response factor for n-C10, n-C16, and nC34.
Gravimetric Heavy Hydrocarbons are not included in the Total C16 - C50 and are only determined if the chromatogram of the C34 - C50 Hydrocarbons indicated that hydrocarbons >C50 are present.
The chromatogram has returned to baseline by the retention time of nC50.
Total C6-C50 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
nC10, nC16 and nC34 response factors are within 10% of their average.
C50 response factor is within 70% of nC10 + nC16 nC34 average.
Linearity is within 15%.
Extraction and holding times were met for this sample.
Fractions 1-4 are quantified with the contribution of PAHs. Under Ontario Regulation 153/04, results are considered valid without determining the PAH contribution if not requested by the client.
NA = Not Applicable

Certified By: NPopnikolof

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Certificate of Analysis

AGAT WORK ORDER: 17T270950

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

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

DATE RECEIVED: 2017-10-12

DATE REPORTED: 2017-10-16

		SAMPLE DESCRIPTION:		Trip Blank
		SAMPLE TYPE:		Water
		DATE SAMPLED:		2017-10-12
Parameter	Unit	G / S	RDL	8810722
Benzene	µg/L	5	0.20	<0.20
Toluene	µg/L	22	0.20	<0.20
Ethylbenzene	µg/L	2.4	0.10	<0.10
Xylene Mixture	µg/L	300	0.20	<0.20
F1 (C6 to C10)	µg/L		25	<25
F1 (C6 to C10) minus BTEX	µg/L	420	25	<25

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard: Refers to ON T8 GW
Guideline values are for general reference only. The guidelines provided may or may not be relevant for the intended use. Refer directly to the applicable standard for regulatory interpretation.

8810722 The C6-C10 fraction is calculated using Toluene response factor.
Total C6-C10 results are corrected for BTEX contributions.
This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.
nC6 and nC10 response factors are within 30% of Toluene response factor.
Extraction and holding times were met for this sample.
NA = Not Applicable

Certified By: NPopnikolof

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

AGAT Laboratories

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

Guideline Violation

AGAT WORK ORDER: 17T270950

PROJECT: 1708-E004

CLIENT NAME: SOIL ENGINEERS LIMITED

ATTENTION TO: Efua Khumbah

SAMPLEID	SAMPLE TITLE	GUIDELINE	ANALYSIS PACKAGE	PARAMETER	UNIT	GUIDEVALUE	RESULT
8810691	MW19	ON T8 GW	O. Reg. 153(511) - PHCs F1 - F4 (Water)	F2 (C10 to C16)	µg/L	150	180

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

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

Quality Assurance

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T270950

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

Trace Organics Analysis

RPT Date: Oct 16, 2017			DUPLICATE				REFERENCE MATERIAL			METHOD BLANK SPIKE			MATRIX SPIKE		
PARAMETER	Batch	Sample Id	Dup #1	Dup #2	RPD	Method Blank	Measured Value	Acceptable Limits		Recovery	Acceptable Limits		Recovery	Acceptable Limits	
								Lower	Upper		Lower	Upper		Lower	Upper
O. Reg. 153(511) - PHCs F1 - F4 (Water)															
Benzene	8810691	8810691	0.44	0.51	NA	< 0.20	85%	50%	140%	102%	60%	130%	99%	50%	140%
Toluene	8810691	8810691	1.4	1.7	19.4%	< 0.20	79%	50%	140%	100%	60%	130%	93%	50%	140%
Ethylbenzene	8810691	8810691	0.34	0.49	NA	< 0.10	73%	50%	140%	80%	60%	130%	80%	50%	140%
Xylene Mixture	8810691	8810691	1.3	1.7	26.7%	< 0.20	82%	50%	140%	97%	60%	130%	95%	50%	140%
F1 (C6 to C10)	8810691	8810691	< 25	< 25	NA	< 25	79%	60%	140%	89%	60%	140%	87%	60%	140%
F2 (C10 to C16)		TW	< 100	< 100	NA	< 100	97%	60%	140%	61%	60%	140%	61%	60%	140%
F3 (C16 to C34)		TW	< 100	< 100	NA	< 100	102%	60%	140%	69%	60%	140%	76%	60%	140%
F4 (C34 to C50)		TW	< 100	< 100	NA	< 100	86%	60%	140%	91%	60%	140%	82%	60%	140%

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

Certified By: NPopnikolof

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

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

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

Method Summary

CLIENT NAME: SOIL ENGINEERS LIMITED

AGAT WORK ORDER: 17T270950

PROJECT: 1708-E004

ATTENTION TO: Efua Khumbah

SAMPLING SITE:

SAMPLED BY:

PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Trace Organics Analysis			
Benzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Toluene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Ethylbenzene	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
Xylene Mixture	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10)	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F1 (C6 to C10) minus BTEX	VOL-91-5010	MOE PHC-E3421	(P&T)GC/FID
F2 (C10 to C16)	VOL-91-5010	MOE PHC-E3421	GC/FID
F3 (C16 to C34)	VOL-91-5010	MOE PHC-E3421	GC/FID
F4 (C34 to C50)	VOL-91-5010	MOE PHC-E3421	GC/FID
Gravimetric Heavy Hydrocarbons	VOL-91-5010	MOE PHC-E3421	BALANCE
Terphenyl	VOL-91-5010		GC/FID

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

AGAT Laboratories

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

Chain of Custody Record

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

Laboratory Use Only

Work Order #: 17T270950

Cooler Quantity: 2 x sm blue

Arrival Temperatures: 1.2 | 1.1 | 1.1°C
2.3 | 2.1 | 2.2°C

Custody Seal Intact: ☐Yes ☐No ☐N/A

Notes: ice

Report Information:

Company: SEL

Contact: Gfua

Address: 90 West Beaver Creek Rd
Richmond Hill

Phone: 416 754 3515 Fax:

Reports to be sent to:

1. Email: ekhumbah@soilengineersltd.com
2. Email: Mrinali.Kalra@soilengineersltd.com

Regulatory Requirements:

☐ No Regulatory Requirement

(Please check all applicable boxes)

☒ Regulation 153/04
Table 1 (Indicate One)
☐ Ind/Com
☐ Res/Park
☐ Agriculture

Soil Texture (Check One)
☐ Coarse
☐ Fine

☐ Sewer Use
☐ Sanitary
☐ Storm

Region _____ (Indicate One)
☐ MISA

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

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

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Turnaround Time (TAT) Required:

Regular TAT ☐ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

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

OR Date Required (Rush Surcharges May Apply):

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

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

Project Information:

Project: 17708-G004

Site Location:

Sampled By:

AGAT Quote #: PO:

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

Invoice Information:

Bill To Same: Yes ☐ No ☐

Company:

Contact:

Address:

Email:

Sample Matrix Legend

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

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	Metals and Inorganics (O. Reg 153: ☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals ☐ 153 Metals (Incl. Hydrides); ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR)	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	PHCs F1 - F4 + BTEX	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	F1/BTEX
MW19	Oct 12/17	11Am	4	GW									X						X
MW20	↓	12:30PM	4	↓									X						
DUP-W1	↓		4	↓									X						
Trip Blank	↓		3	↓															

Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Mrinali Kalra	Oct 12/17	2:00pm			
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
Samples Relinquished By (Print Name and Sign):	Date	Time	Samples Received By (Print Name and Sign):	Date	Time
				Oct 12	3:50

Page 1 of 1

Nº: T 061997

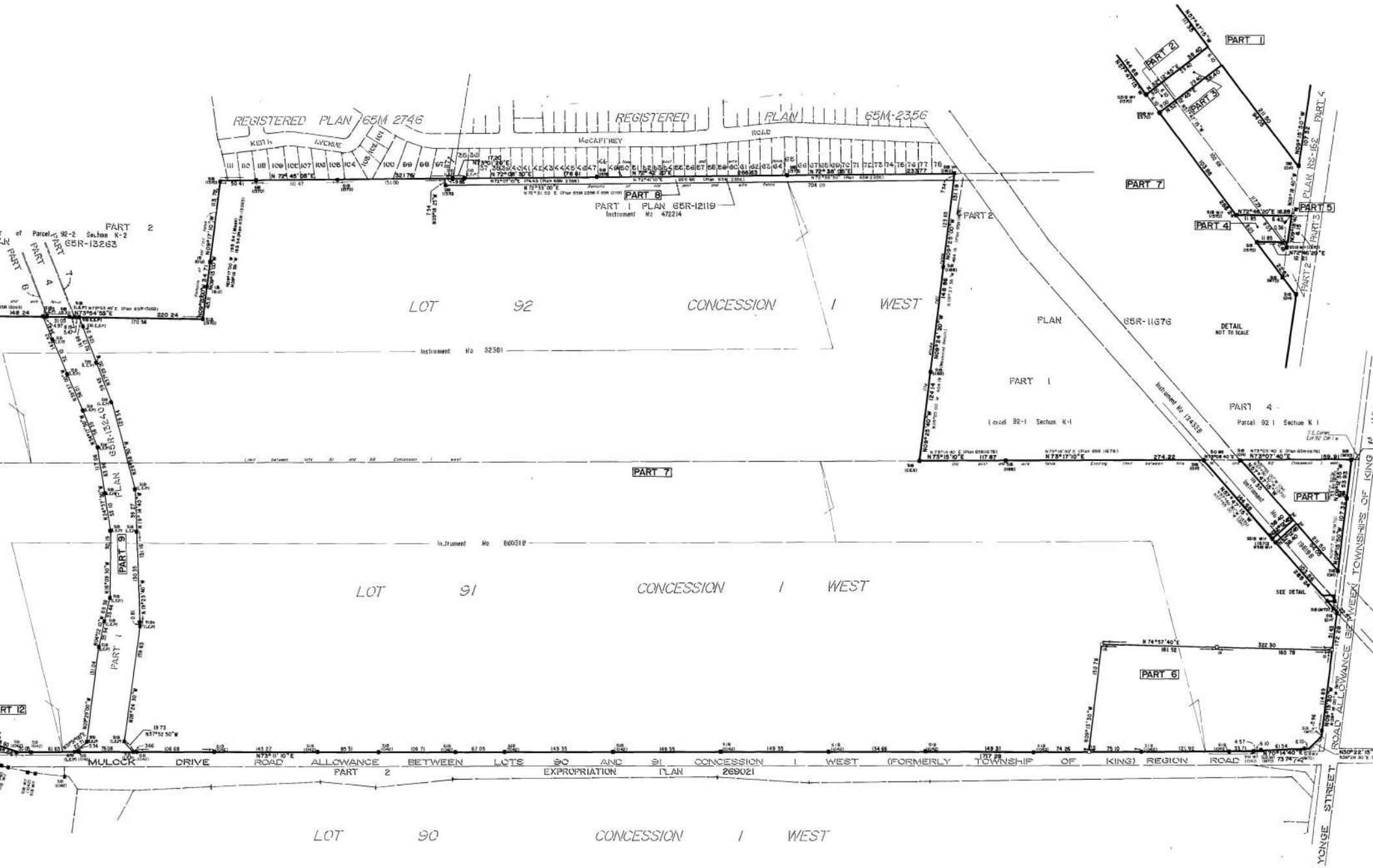
Soil Engineers Ltd.
CONSULTING ENGINEERS
GEOTECHNICAL • ENVIRONMENTAL • HYDROGEOLOGICAL • BUILDING SCIENCE
90 WEST BEAVER CREEK ROAD, SUITE #100, RICHMOND HILL, ONTARIO L4B 1E7 · TEL (416) 754-8515 · FAX (905) 881-8335

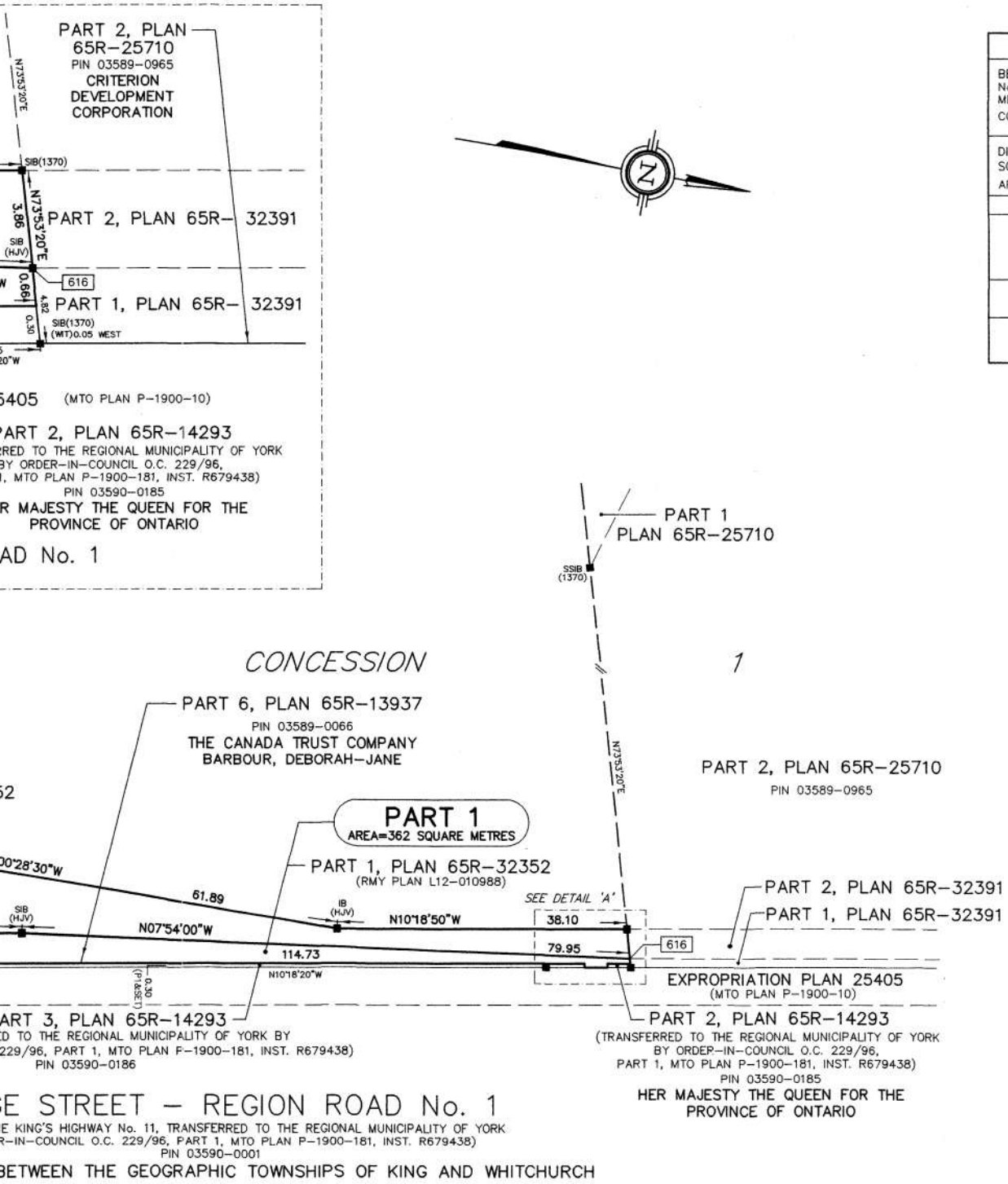
BARRIE	MISSISSAUGA	OSHAWA	NEWMARKET	GRAVENHURST	PETERBOROUGH	HAMILTON
TEL: (705) 721-7863	TEL: (905) 542-7605	TEL: (905) 440-2040	TEL: (905) 853-0647	TEL: (705) 684-4242	TEL: (905) 440-2040	TEL: (905) 777-7956
FAX: (705) 721-7864	FAX: (905) 542-2769	FAX: (905) 725-1315	FAX: (905) 881-8335	FAX: (705)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

APPENDIX 'E'

PROPERTY SURVEY PLAN

REFERENCE NO. 1708-E004


REGISTERED PLAN 65M 2746
REGISTERED PLAN 65M-2356
KEITH AVENUE
McCAFFREY ROAD
PART 8
PART 1 PLAN 65R-12119
Instrument No 472214
PART 2
PART 7
PART 9
PART 6
PART 1
PART 4
PART 3
PART 5
PART 12
LOT 92 CONCESSION 1 WEST
LOT 91 CONCESSION 1 WEST
LOT 90 CONCESSION 1 WEST
Instrument No 32361
Instrument No 86031B
PLAN 65R-11676
DETAIL NOT TO SCALE
SEE DETAIL
MULOCK DRIVE ROAD ALLOWANCE BETWEEN LOTS 90 AND 91 CONCESSION 1 WEST (FORMERLY TOWNSHIP OF KING) REGION ROAD
PART 2 EXPROPRIATION PLAN 269021
YONGE STREET
ROAD ALLOWANCE BETWEEN TOWNSHIPS OF KING



BEARINGS AND CO-ORDINATE VALUES

BEARINGS AND CO-ORDINATES ARE GRID AND ARE DERIVED FROM SPECIFIED CONTROL POINTS No. 00819730030 AND No. 00919734532 AND ARE REFERRED TO THE 6° UNIVERSAL TRANSVERSE MERCATOR GRID PROJECTION, ZONE 17, CENTRAL MERIDIAN 81°00' WEST LONGITUDE, NAD83 (ORIGINAL).
CO-ORDINATES TO URBAN ACCURACY PER SEC. 14(2) OF O. REG. 216/10.

DISTANCES ARE GROUND AND CAN BE CONVERTED TO GRID BY MULTIPLYING BY THE COMBINED SCALE FACTOR OF 0.99974520.
AREAS SHOWN HEREON ARE CALCULATED FROM GROUND DISTANCES.

POINT ID	EASTING	NORTHING
SCP 00819730030	621973.59	4877691.19
SCP 00919734532	622411.55	4875181.94
ORP 409	622080.73	4877055.29
ORP 616	622062.26	4877179.64

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

DISTANCES AND CO-ORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

NOTES

■	DENOTES	SURVEY MONUMENT FOUND
IB	DENOTES	IRON BAR
SIB	DENOTES	STANDARD IRON BAR
SSIB	DENOTES	SHORT STANDARD IRON BAR
CM	DENOTES	CONCRETE MONUMENT
WIT	DENOTES	WITNESS
HJV	DENOTES	HOLDING JONES VANDERVEEN INC., O.L.S.
MTO	DENOTES	MINISTRY OF TRANSPORTATION OF ONTARIO
RMY	DENOTES	THE REGIONAL MUNICIPALITY OF YORK
1370	DENOTES	KRCMAR SURVEYORS LTD., O.L.S.
ORP	DENOTES	OBSERVED REFERENCE POINT
SCP	DENOTES	SPECIFIED CONTROL POINT
P1	DENOTES	PLAN 65R-32352

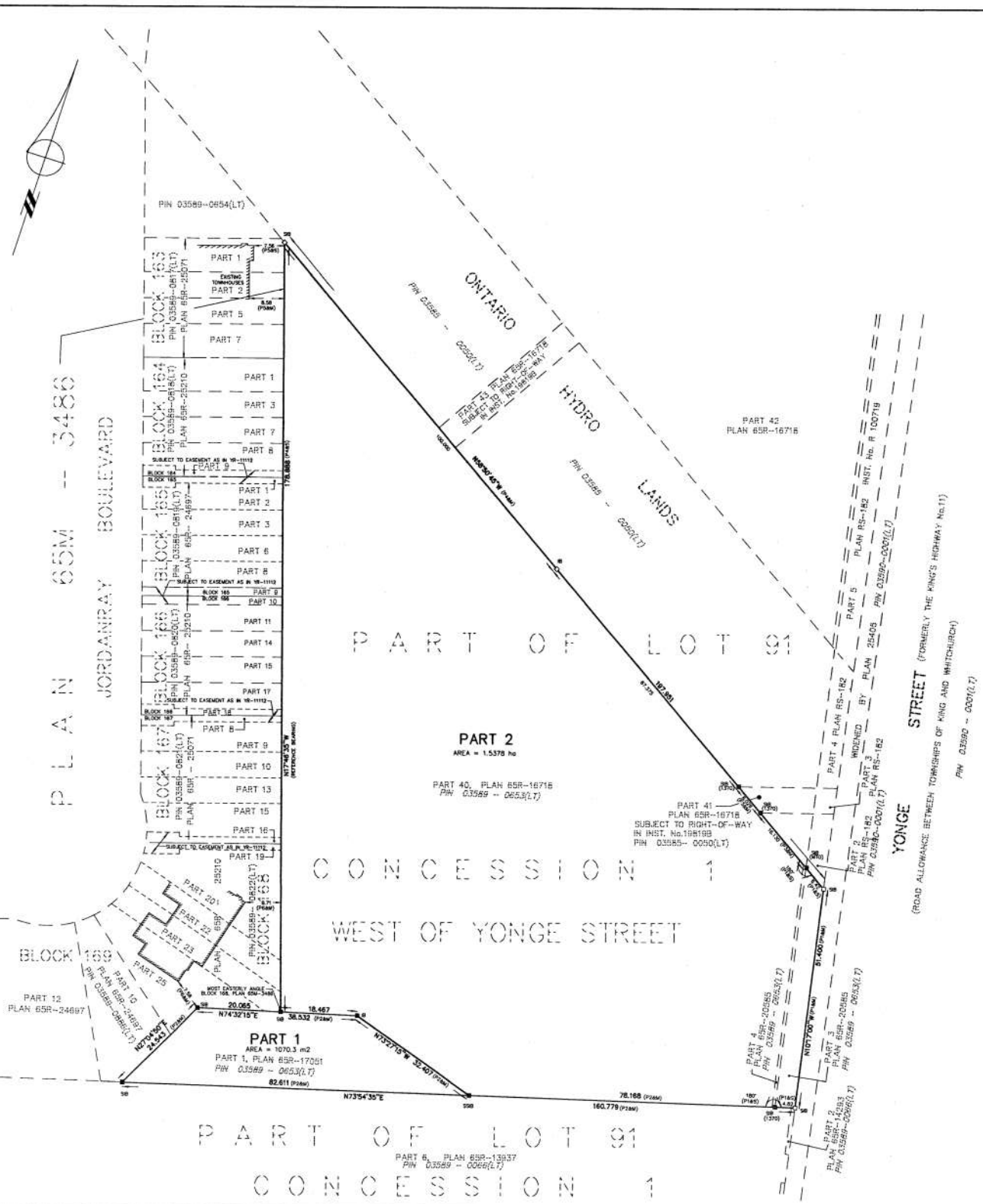
SURVEYOR'S CERTIFICATE

I CERTIFY THAT:

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE EXPROPRIATIONS ACT AND THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.
2. THE SURVEY WAS COMPLETED ON OCTOBER 30, 2013.

OCTOBER 30, 2013
DATE

GARY B. VANDERVEEN
ONTARIO LAND SURVEYOR



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

DATE JANUARY 30 ,2003

DARIO STARCEVIC
ONTARIO LAND SURVEYOR

PLAN 65R-2

RECEIVED AND DEPOSITED

DATE Feb. 6

Asst Reg.
LAND REGISTRAR FOR THE L
DIVISION OF YORK REGION

SCHEDULE OF PARTS

PART	PART OF LOT	CONCESSION	ALL OF PIN
1	91	1 W.Y.S.	03589-0653(LT)
2			

PLAN OF SURVEY OF
PART OF LOT 91, CONCESSI
WEST OF YONGE STREET
TOWN OF NEWMARKET
(GEOGRAPHIC TOWNSHIP OF KING, COUNTY OF
REGIONAL MUNICIPALITY OF YOR

SCALE 1:500

10 0 10 20 30 40m

KRCMAR SURVEYORS LTD. 2003

METRIC : DISTANCES SHOWN ON THIS PLAN ARE IN METRE AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.304

NOTE

BEARINGS ARE GRID AND ARE REFERRED TO THE EASTERLY LIMIT OF BLOCKS 163 TO 168 INCLUSIVE AS SHOWN ON PLAN 65M-3486, HAVING A BEARING OF N17°46'35"W

LEGEND

⊕	DENOTES SURVEY MONUMENT PLANTED
◆	DENOTES SURVEY MONUMENT FOUND
SIB	DENOTES STANDARD IRON BAR
IB	DENOTES IRON BAR
SSIB	DENOTES SHORT STANDARD IRON BAR
P1	DENOTES PLAN 65R-20585
P2	DENOTES PLAN 65R-17051
P3	DENOTES PLAN 65R-16718
P4	DENOTES PLAN 65M-3486
P5	DENOTES PLAN 65R-25071
P6	DENOTES PLAN 65R-25210
(OH)	DENOTES ONTARIO HYDRO
1370	DENOTES KRCMAR SURVEYORS LTD.
MTO	DENOTES MINISTRY OF TRANSPORTATION OF ONTARIO
W.Y.S.	DENOTES WEST OF YONGE STREET

ALL FOUND MONUMENTS WERE BY KRCMAR SURVEYORS LTD. UNLESS OTHERWISE NOTED

SURVEYOR'S CERTIFICATE

I CERTIFY THAT

1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT AND THE LAND TITLES ACT ACT AND THE REGULATIONS MADE UNDER THEM;
2. THE SURVEY WAS COMPLETED ON THE 30 DAY OF JANUARY

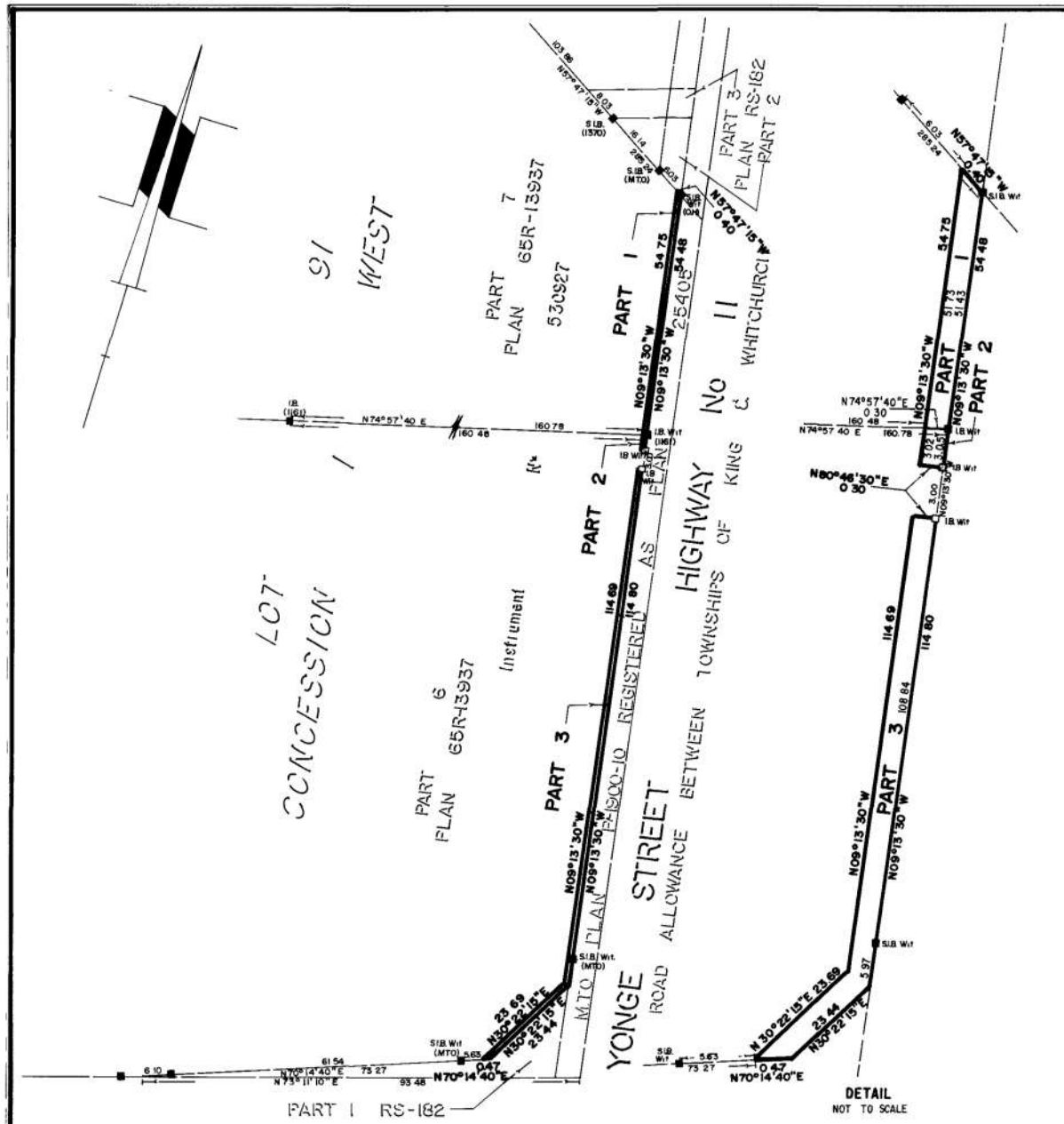
DATE JANUARY 30 ,2003

DARIO STARCEVIC
ONTARIO LAND SURVEYOR

FIELD:	DRAWN:	CHECKED:	JOB NO
LP/VS	BA	DS	
DWG NAME: 89217R48.dwg	PLOT INFO: 16:04 10/May/2002		WORK ORDER

1137 Centre Street Thornhill ON L4J 3M6
905.738.0053 F 905.738.9221 www.krcmar.ca

KRCM



MULOCK DRIVE - REGION ROAD 74
ROAD ALLOWANCE BETWEEN LOTS 90 & 91 CONCESSION 1
(FORMERLY TOWNSHIP OF KING)

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER *THE REGISTRY ACT*

DATE April 18, 1990

DONALD A CANNON
ONTARIO LAND SURVEYOR

PLAN 65R-14293

RECEIVED AND DEPOSITED
DATE 26th APRIL, 1990

Linda Foote
ASS'T DEP LAND REGISTRAR
FOR THE LAND REGISTRY DIVISION OF YORK REGION (No 65)

CAUTION THIS PLAN IS NOT A PLAN OF SUBDIVISION WITHIN THE MEANING OF *THE PLANNING ACT*

METRIC DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0 3048

PART SCHEDULE

PART	LOT	CONC.	AREA	INSTRUMENT No
1	Part of 91	1 w	15 5 m²	530927
2	Part of 91	1 w	0 9 m²	530927
3	Part of 91	1 w	41 5 m²	530927

PLAN OF SURVEY OF PART OF
LOT 91 CONCESSION 1 WEST
(FORMERLY TOWNSHIP OF KING)
TOWN OF NEWMARKET
REGIONAL MUNICIPALITY OF YORK
SCALE 1 800
0 5m 10m 15m 20m 30m 40m 50m
WILLIAM J PLAXTON LIMITED - 1990

NOTES AND LEGEND

—o—	Denotes	Set Monumentation
—■—	"	Found Monumentation
Meas	"	Measured
Wit	"	Witness
SIB	"	Standard Iron Bar
IB	"	Iron Bar
MTO	"	Ministry of Transportation, Ontario
OH	"	Ontario Hydro
1161	"	W J Plaxton Limited OLS
1370	"	V Krcmar Limited OLS

Bearings shown are astronomic, referred to the N09°13'30"W of the west limit of YONGE STREET as shown on Plan 65R - 13937

SURVEYOR'S CERTIFICATE

I certify that

1 This survey and plan are correct and in accordance with *The Surveys Act* and *The Registry Act* and the regulations made thereunder
2 The survey was completed on the 16th day of April, 1990

Date April 18, 1990

DONALD A CANNON ONTARIO LAND SURVEYOR

WILLIAM J. PLAXTON LIMITED
WILLIAM J PLAXTON B.A. O.L.S DONALD A CANNON O.L.S.
ONTARIO LAND SURVEYORS
1896A AVENUE ROAD TORONTO M5M 3Z8 (416) 789-2124

FOR: Mr WILLIAM G CHAPIN solicitor
DATE APRIL 18, 1990 CHECKED: D.A.C. DRAWN BY: D.C. PROJECT No 9067

65R 14293