FISHER ENVIRONMENTAL LTD.

**ENGINEERING**

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CALA
Canadian Association for Laboratory Accreditation Inc.

# PHASE II ENVIRONMENTAL SITE ASSESSMENT

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Project No. FE-P 20-10069

March 4, 2020

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| **Project Name:** | Phase II Environmental Site Assessment |
| **Project Address:** | 86 Thomas Street, Mississauga, Ontario |
| **Project Number:** | FE-P 20-10069 |
| **Issued on:** | March 4, 2020 |

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# GLOSSARY OF ACRONYMS

| | |
|---|---|
| asl: | Above Sea Level |
| bgs: | Below Ground Surface |
| BTEX: | Benzene, Toluene, Ethylbenzene and Xylenes |
| CPC: | Contaminants of Potential Concern |
| CSA: | Canadian Standards Association |
| ESA: | Environmental Site Assessment |
| MECP: | Ministry of the Environment, Conservation and Parks |
| MOE: | Ministry of the Environment |
| OHSA: | Occupational Health and Safety Act |
| PCA: | Potentially Contaminating Activity |
| PCB: | Polychlorinated Biphenyls |
| pH: | potential of Hydrogen |
| PHC (F1-F4): | Petroleum Hydrocarbons (Fractions 1 to 4) |
| ppb: | Parts per Billion |
| ppm: | Parts per Million |
| RSC: | Record of Site Condition |
| UST: | Underground Storage Tank |
| VOC: | Volatile Organic Compounds |

# 1. EXECUTIVE SUMMARY

Fisher Environmental Ltd. (Fisher) was commissioned by Mr. Rocco Forgione to carry out a Phase II Environmental Site Assessment (ESA) of the property located at 86 Thomas Street, Mississauga, Ontario, hereinafter referred to as the "Site". The subsurface soil and groundwater investigation was carried out between February 5 and 19, 2020.

The Site is located on the north side of Thomas Street approximately 400 m west of the intersection of Queen Street South in Mississauga, Ontario. The Site is bounded by vacant land to the north and east, residential houses to the west and Thomas Street to the south. The Site has an area of approximately 1,680 $m^2$. The legal description of the Site is Part of Lot 4, Concession 4 W, City of Mississauga, Regional Municipality of Peel, Ontario.

The Site is currently vacant and undeveloped and covered with snow. According to the property owner, Mr. Forgione, in September 2019, the surface of the entire site was graded and leveled and approximately 2.4 to 3 meters of surface soil was removed from the Site. Historically, the Site was occupied by a two-storey residential house with a basement, which were demolished and removed from the site approximately in 2009.

In January 2010, Terraprobe conducted a Phase I ESA for the Site. Based on the information gathered and observations made during this investigation, the report revealed evidence of potential environmental contamination associated with an adjacent property at 80 Thomas Street (up-gradient to the north and east of the subject site). This property is occupied by CTS of Canada Co., an automotive products manufacturing, and was identified as a registered hazardous waste generator. Identification of potential environmental contamination was based on current/previous potentially contaminating activities and hazardous waste generators at 80 Thomas Street.

It was recommended that a Phase II ESA be conducted at the identified areas of potential environmental concern at the subject property, to determine the location and concentration of potential contaminants in the soil or groundwater on, in or under the phase one property.

In the current investigation, three (3) boreholes were advanced in the investigated property to depths of up to 5.60 m bgs, and in three (3) of them, BH1(MW), BH2(MW) and BH3(MW), monitoring wells were installed to facilitate groundwater level monitoring and sampling.

On the basis of the boreholes completed, the stratigraphy at the investigated areas of the Site generally consists of brown to grey clayey silt till to up to 5.60 bgs, underlying by very dense soil most likely bedrock.

Groundwater static level measurement was taken at the monitoring well locations on February 19, 2020, and it was noted at depths ranging from 2.03 m bgs in BH2(MW) to 4.85 m bgs in BH1(MW). Based on the static water levels measured in three (3) monitoring wells, the local groundwater flow direction was determined to be northeast.

A total of nine (9) soil and six (6) groundwater samples were submitted to the laboratory for Metals, PHC(F1-F4), VOC, PCB, and/or pH analysis.

For the purpose of this Phase II ESA, the appropriate standards were identified as: Table 3 (Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition – Residential/Parkland/Institutional Property Use for soil samples and All Types of Property Use for groundwater samples, medium to fine textured soil) as contained in the MOE Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, hereinafter referred to as the “MOE Standards”.

**Findings - Soil**

The results of chemical analysis for all nine (9) soil samples were found to be in compliance with the applicable MOE Standards.

**Findings - Groundwater**

The results of chemical analysis for all six (6) groundwater samples were found to be in compliance with the applicable MOE standards.

**Recommendations**

Based on the current subsurface investigation, it is concluded that no evidence of soil and groundwater contamination has occurred at the selected sampling locations. No further investigation is recommended at this time.

## 2. INTRODUCTION

Fisher Environmental Ltd. (Fisher) was commissioned by Mr. Rocco Forgione to carry out a Phase II Environmental Site Assessment (ESA) of the property located at 86 Thomas Street, Mississauga, Ontario, hereinafter referred to as the "Site". The subsurface soil and groundwater investigation was carried out between February 5 and 19, 2020.

## 3. PROPERTY DESCRIPTION

The Site is located on the north side of Thomas Street approximately 400 m west of the intersection of Queen Street South in Mississauga, Ontario. The Site is bounded by vacant land to the north and east, residential houses to the west and Thomas Street to the south. The Site has an area of approximately 1,680 $m^2$. The legal description of the Site is Part of Lot 4, Concession 4 W, City of Mississauga, Regional Municipality of Peel, Ontario. Please refer to Appendix A for a Site Location Map.

The Site is currently vacant and undeveloped and covered with snow. According to Mr. Forgione, the property owner, the Site was occupied by a two-storey residential house with a basement, which were demolished and removed from the site in 2009. In addition, in September 2019, the surface of the entire site was graded and leveled and approximately 2.4 to 3 meters of surface soil was removed from the Site.

## 4. EXISTING REPORTS REVIEW

The following previous report was reviewed and used as a source of background information:

**TABLE 1: PREVIOUS REPORTS**

| | |
|---|---|
| **Report Title:** | Phase I Environmental Site Assessment, 86 Thomas Street, Mississauga, Ontario |
| **Prepared By:** | Terraprobe |
| **Date:** | January 12, 2010. |
| **Findings and Conclusions** | |
| Based on the information gathered and observations made during this investigation, the report revealed evidence of potential environmental contamination associated with an adjacent property at 80 Thomas Street (up-gradient to the north and east of the subject site). This property is occupied by CTS of Canada Co., an automotive products manufacturing, and was identified as a registered hazardous waste generator. Identification of potential environmental contamination was based on current/ previous potentially contaminating activities and hazardous waste generators at 80 Thomas Street. | |

It was recommended that a Phase II ESA be conducted at the identified areas of potential environmental concern at the subject property, to determine the location and concentration of potential contaminants in the soil or groundwater on, in or under the phase one property.

## 5. SCOPE OF WORK

The current Phase II ESA was conducted in accordance with the CAN/CSA-Z769-00 standards, as published in March 2000 and reaffirmed in 2013, by the CSA Group.

A Phase II ESA involves sampling and testing of materials considered, usually by the outcome of a Phase I ESA or other investigation, to be possible instances of environmental contamination. The project, as carried out, fulfills the scope of a "Reconnaissance" type investigation in which conditions are previously unknown, and the aim is to establish whether any environmental contamination is present. Normal environmental assessment protocol reserves a detailed investigation for a subsequent phase if the reconnaissance survey indicates a requirement for further contaminant delineation.

The scope of this work generally consisted of the following:

- **Field Program -** Clearance of underground utilities and advancement of three (3) boreholes to depths of up to 6.00 m or resistance, and installation of three (3) groundwater monitoring wells.
- **Laboratory Testing Program -** Recovery and analysis of selected soil and groundwater samples for Metals, PHC (F1-F4), VOC, PCB, and/or pH.
- **Data Evaluation -** Comparison of results of chemical analyses with the applicable MOE (currently MECP) Standards.
- **Reporting -** Provision of final engineering report detailing findings of performed works, and any further recommendations.

As conducted, the present investigation may lack information or analytical work that are specific requirements for filing a Record of Site Condition (RSC) under Part XV.1 of the EPA and Amended O. Reg. 153/04, therefore, if a RSC is necessary, the property owner or its agent should undertake complementary investigations required under the RSC filing process.

# 6. FIELD PROGRAM

The subsurface soil and groundwater investigation (Phase II ESA) was carried out between February 5 and 19, 2020. The field work was conducted by Raja Ramdial, under supervision of Larissa Sakhnenko, of Fisher Environmental Ltd. who directed drilling and sampling operations, and assured proper chain of custody procedures for the recovered soil and groundwater samples.

Three (3) boreholes were advanced in the investigated property to depths of up to 5.60 m bgs, and in all of them monitoring wells were installed to facilitate groundwater level monitoring and sampling.

## *6.1. Site Preparation*

Site preparation included the location of public and private underground services by referring to the respective utilities: Mississauga Hydro, Enbridge Gas, Bell Canada, Public Works, water, sewer and light cables to avoid potential disruptions to the utilities during the drilling. Soil drilling was conducted following receipt of clearance from all utilities for the given borehole locations.

## *6.2. Boreholes, Soil and Groundwater Sampling*

The borehole locations were selected by an initial rationale as being the most likely locations of contamination. Refer to the attached Site Plan with Borehole and Monitoring Well Locations (Figure 1 in Appendix A) and Table 2 for description of borehole locations rationale.

Three (3) boreholes were advanced in the investigated property on February 5, 2020. Borehole drilling was carried out using a GeoProbe drilling rig. The boreholes were extended to depths of up to 5.60 m, at which point native material had been reached.

**TABLE 2: BOREHOLE LOCATION RATIONALE**

| Borehole # | Borehole Location and Reason |
|---|---|
| BH1(MW) | Evaluate sub-surface soil and groundwater condition at the northeast corner of the Site in close proximity to the former off-site transformer location and in relation to potential impacts that may have historically originated from off-site industrial operation. |
| BH2(MW) | Evaluate sub-surface soil and groundwater condition along the north boundary of the Site in relation to potential impacts that may have historically originated from off-site industrial operation. |

| Borehole # | Borehole Location and Reason |
|---|---|
| BH3(MW) | Evaluate sub-surface soil and groundwater condition along the east boundary of the Site in relation to potential impacts that may have historically originated from off-site industrial operation. |

Fisher retains Terra Firma Environmental Services Ltd. (Terra Firma) as our drilling contractor. Terra Firma maintains licensure for drilling (Water Well Drillers, Environmental Protection Act, Well Contractor License No. 6946) as required by the MOE, and conducted drilling and soil sampling works in accordance with CSA Standard Z769-00 (reaffirmed in 2013) and the Ontario Ministry of Environment and Energy (MOEE, currently MECP) "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario", December 1996, and in compliance with Occupational Health and Safety regulations.

The intrusive subsurface investigation was conducted by means of a GeoProbe® Model 420M / 7822DT direct push machine. The GeoProbe® applies static weight and hammer percussion to a rod string in order to advance the probing sampling rods into the subsurface. Soil samples were collected at 0.60 m (2 ft) intervals and at stratigraphic boundaries.

Soil and groundwater samples were collected and handled in accordance with generally accepted sampling and handling procedures used by the environmental consulting industry. For guidance, these practices rely on the 1996 MOEE publication "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario". To minimize the potential for cross contamination between soil samples, the split spoon sampler used to collect soil samples from the boreholes was brushed clean of soil and then washed in municipal water containing phosphate free detergent, rinsed in municipal water and then rinsed with distilled water.

As well, new disposable nitrile gloves and stainless-steel spatula were used during each sampling event to remove the soil cores from the sampler and to transfer the samples into plastic bags and/or glass jars.

Through each soil sample, the lithology and esthetic evidence of impacts (debris, staining and odours) were recorded as part of field quality control (QC) procedures. Additionally each sample was screened in the field for headspace vapour concentration (combustible soil vapour and total organic vapour) using the 10.6 eV lamp MiniRae 2000 PID calibrated to 100 ppm Isobutylene. The samples were kept out of direct sunlight during field storage and the headspace measurements were made after at least two hours had elapsed since the sample *was bagged*

*and the sample had* reached a minimum temperature of 15ºC. The headspace monitoring was performed on the samples as a preliminary screening for analysis.

Selection of samples to be submitted for laboratory analysis are based on the headspace vapour concentration, physical evidence of odours/ staining, apparent water table and/or proximity to potential contaminant sources. If no odours/staining are noted in the soil samples, the samples with the highest field screening measurement (i.e. highest headspace vapour concentration) are selected for laboratory analysis. Soil samples from the boreholes selected for potential chemical analysis of organic parameters were placed directly into laboratory supplied glass jars at the time of sampling, labeled and packed with minimal headspace. Samples were kept in coolers provided with cold packs during field storage and transportation to Fisher Environmental Laboratories for analysis.

Two (2) field duplicate soil sample had been submitted to the lab for analysis for quality assurance/ quality control (QA/QC) purposes.

Following sampling, groundwater monitoring wells were installed in all three (3) boreholes, in accordance to O. Reg. 903.

## *6.3. Monitoring Wells Program*

Three (3) monitoring wells were installed on the subject property. The wells were constructed of 52 mm ID diameter PVC pipes, which were pre-cleaned at the factory and delivered to the Site in sealed plastic bags. Further construction details of the monitoring wells are provided on the “Log of Boreholes” attached in Appendix B.

Groundwater sampling in the installed monitoring wells was conducted using bailers, where single-use (disposable) bailers are slowly lowered into the water column, allowed to fill, and removed.

Installed monitoring wells were sampled on February 9, 2020. It was noted that BH1(MW) located at the northeast corner was dry and very little water was found in BH3(MW) located near the east boundary of the Site. Additional groundwater sampling was conducted on February 19, 2020. Prior to sampling, three (3) well volumes of groundwater were purged from each well to ensure the sampling of “fresh” formation water.

Laboratory supplied sample containers were used to collect groundwater samples which were labeled, stored in coolers provided with cold packs during field storage and transportation to Fisher Environmental Laboratories for analysis.

One (1) field duplicate groundwater sample has been submitted to the lab for analysis for QA/QC purposes.

Groundwater static level measurement was conducted prior to sampling. The groundwater static level measurements are summarized in Table 3 below.

**TABLE 3: GROUNDWATER STATIC LEVEL MEASUREMENTS**

| Location | Well Depth, m bgs | Groundwater Static Level, m bgs (February 9, 2020) | Groundwater Static Level, m bgs (February 19, 2020) | Groundwater Relative Elevation, m asl |
|---|---|---|---|---|
| BH1(MW) | 5.14 | Dry | 4.85 | 95.15 |
| BH2(MW) | 5.17 | 3.50 | 2.03 | 97.97 |
| BH3(MW) | 5.60 | 5.40 | 4.46 | 95.54 |

The ground relative elevations were established using the benchmark “top of the concrete sidewalk near the southwest corner of the Site”, as having an assumed elevation of 100.00 m asl.

Groundwater generally flows from areas of high hydraulic head towards areas of low hydraulic head. To assess the direction of groundwater movement, the hydraulic head is measured at each well location. This is accomplished by taking water level measurements and referencing them to a known benchmark to determine their elevation. Water level measurements having higher elevations suggest greater hydraulic head. Conversely, lower elevations of the water table are indicative of a lesser hydraulic head.

Based on general topography and the distance to the nearest open water body – Mullet Creek, located approximately 230 m east, the local groundwater flow direction is predicted to be east.

Based on the static water levels measured in the three (3) monitoring wells, and relative ground elevations measured at the corresponding locations, the local groundwater flow direction was calculated to be northeast.

The localized shallow groundwater flow direction may be influenced by the presence of underground utilities, building foundation, variations in vertical and horizontal stratigraphy, depth of wells' screened intervals and/or well trauma.

## *6.4. Well Record Filed with the MECP*

Groundwater monitoring well installations for this project are regulated under Regulation 903 of the Ontario Water Resources Act. The regulation reveals certain responsibilities on Fisher or Terra Firma and the property owner. As a condition to Terra Firma providing groundwater monitoring well installation services, our client has accepted responsibility for ensuring that the property owner accepts the following conditions:

1. The name and address of the property owner have been provided.
2. Terra Firma has permission to submit well records to the Ministry and to the property owner and to report multiple installations on a single well record.
3. Well tags on installations must not be removed or destroyed.
4. Unless otherwise agreed, installations will be decommissioned by the property owner within 180 days of installation.
5. The property owner is responsible for future decommissioning of all installations in accordance with the regulation.
6. The property owner is responsible for any expenses associated with controlling and decommissioning installations that have, or may have in the future, artesian conditions.
7. Maintenance of well installations in accordance with the regulation will be by the property owner. This includes ensuring that seals remain adequate for preventing water or gas migration between formations and to/from surface, that seals do not deteriorate and that wells are decommissioned.
8. The client and property owner accept responsibility for the inherent risk associated with industry standard installations, and acknowledge that conditions and materials do not remain constant with time nor that they can be completely quantified or predicted in advance.

## 6.5. Site Topography and Geology

The Google Earth indicates that the ground surface elevation in the vicinity of the property is approximately 158 to 160 m asl. The Site area is flat and leveled. There is approximately 2 m drop in grade at the west property boundary and the Site is at the same elevation with the north, east and south adjacent land.

The closest body of water is Mullet Creek, which runs north-south, approximately 230 m east of the Site, which connects to the Credit River further south, eventually flowing to the south east towards Lake Ontario. Based on the general topography of the Site and surrounding area and distance to the closest open water body (Mullet Creek), the near-surface groundwater at the Site is inferred to flow to the east.

According to Sharp, D.R., 1980: Quaternary Geology of Toronto and Surrounding Area Southern Ontario; Ontario Survey Preliminary Map. P. 2204, Geological Series, the Site is situated in an area characterized as Young Tills: clayey silt till.

On the basis of the boreholes completed, the stratigraphy at the investigated areas of the Site generally consists of brown to grey clayey silt till to up to 5.6 bgs, underlying by very dense soil most likely bedrock. Bedrock in the vicinity of the Site is expected to be grey shale with limestone interbeds of the Georgian Bay Formation. A description of the subsurface conditions encountered at the boreholes locations is presented in Appendix B - Log of Boreholes.

## 6.6. Head Space Combustible Vapours

A 10.6 eV lamp MiniRae 2000 PID calibrated to 100 ppm Isobutylene was used to measure combustible vapours in the soil samples. Vapour concentrations were read during the soil sampling and all soil samples had concentrations of 0 ppm. The headspace readings for all collected soil samples are shown on the Log of Boreholes attached in Appendix B of this report.

## 6.7. Visual Olfactory Soil / Groundwater Quality

During the borehole-drilling program, the following visual/olfactory observations were made:

- No fill materials were encountered.
- No odours were noted in any collected soil or groundwater samples.

## *6.8. Selection of Analytical Samples and Parameters*

Selection of samples for environmental analysis was based on expectations of Site conditions, and proximity of potential contaminant sources.

Nine (9) soil samples were submitted to the laboratory for Metals, PHC (F1-F4), VOC, PCB, and/or pH analysis. Six (6) groundwater samples were collected from the three (3) installed groundwater wells, and were submitted to the laboratory for Metals, PHC (F1-F4), VOC and PCB analysis.

**TABLE 4: RATIONALE FOR ANALYTICAL PARAMETER**

| Parameter | Description |
|---|---|
| *Metals* | Various metallic elements can cause adverse environmental effects at relatively low concentrations. Such metals are associated with industrial activities and/or the use of fill materials of unknown quality, both historic and current, and it is common practice to include Metals analysis in subsurface soil investigations. Four (4) soil and four (4) groundwater samples collected at the Site were submitted for Metals analysis. |
| *PHC(F1-F4)* | PHC are components of gasoline, diesel and other petroleum products for which soil quality guidelines have been developed. These compounds are widely utilized and often included in the evaluation of a Site's overall subsurface condition. Four (4) soil and four (4) groundwater samples collected at the Site were submitted for PHC (F1-F4) analysis. |
| *VOC* | VOC are any volatile compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, and exempt compounds. VOC are included in gasoline, diesel, crude oil, lubricant, waste oil, adhesive, paint, stain, solvents, resin, monomer, and/or any other material containing VOC. Note that VOC analysis includes Benzene, Toluene, Ethylbenzene, Xylene (BTEX) parameters. Four (4) soil and four (4) groundwater samples collected at the Site were submitted for VOC analysis. |
| *PCB* | PCBs are mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCB were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. One (1) soil and one (1) groundwater sample collected at the Site were submitted for PCB analysis. |
| *pH* | Soil pH is referred to as the "acidity" of the soil. When the soil pH is too "acid" (low pH) or too "alkaline" (high pH), nutrients present in the soil become locked-up or unavailable. Two (2) soil samples collected at the Site were submitted for pH analysis. |

# 7. LABORATORY PROGRAM

## *7.1. General*

Recovered soil and groundwater samples were submitted to Fisher Environmental Laboratories for analysis. As a Canadian Association for Laboratory Accreditation (CALA) registered analytical facility, QA/QC procedures were maintained consistent with CALA requirements and standard laboratory practices. The laboratories ensured that analytical sub-samples were, by appearance, representative of the whole sample as collected in the field.

## *7.2. Data Evaluation*

### 7.2.1. Soil and Groundwater Standards

The MOE presents Soil and Groundwater Standards, under the Publication “Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act” April 15, 2011. These standards present soil and groundwater criteria, which have been developed with regard to toxicological data. They are levels at and below which no environmental or safety concerns, or adverse conditions, are anticipated for environments or persons with average sensitivity.

The subject property has been used for residential purposes, and it is our understanding that the property will maintain its current residential land use.

With regards to the potability status of the groundwater, it is understood that the surrounding area relies on municipal water as a source of drinking water. For the purpose of assessing the soil and groundwater quality at the subject site in accordance to the requirements for site assessment, under Part XV.1 of the EPA and Ontario Regulation 153/04, it is our intention to utilize a non-potable groundwater condition standard.

As specified by O. Reg. 153/04, "coarse textured soil is defined as material having more than 50 percent (by mass) of particles that are 75 μm or larger in mean diameter. Materials having more than 50 percent (by mass) of particles that are smaller than 75 μm in mean diameter are medium and fine textured soils." “When at least 1/3 of the soil at the property, measured by volume, consists of coarse textured soil, the standard for coarse textured soil shall apply. In any other case, the standard for medium and fine textured soil may be applied”.

A grain size analysis was not completed at the time of the investigation, however, considering the visually identified soil types encountered at the borehole locations, and the distribution of boreholes across the Site, the generally more conservative site condition standards for coarse textured soil have been applied.

For the purpose of this Phase II ESA, the appropriate standards were identified as: Table 3 (Full Depth Generic Site Condition Standards in a Non-Potable Groundwater Condition – Residential/Parkland/Institutional Property Use for soil samples and All Types of Property Use for groundwater samples, medium to fine textured soil) as contained in the MOE Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011, hereinafter referred to as the "MOE Standards".

The criteria values are presented with the results of analysis in the last column of the Certificates of Analysis (Appendix C).

### 7.2.2. Soil and Groundwater Quality

Nine (9) soil and six (6) groundwater samples were submitted to the laboratory for Metals, PHC (F1-F4), VOC, PCB, and/or pH analysis. A copy of the Laboratory Certificates of Analysis is provided in Appendix C. Results of the chemical analyses are summarized in Table 6.

**TABLE 5: EXCEEDANCES OF APPLICABLE SITE CONDITION STANDARDS**

| Borehole | Sample Depth | Sample # | Parameters Analyzed | Exceedances of April 15, 2011 Table 3 MOE Standards, Residential/Parkland/Institutional Property Use (R/P/I) Non-Potable Groundwater condition |
|---|---|---|---|---|
| **Soil (20-4038) - February 5, 2020** | | | | |
| BH1(MW) | 0.00-0.60 m | 20-4038-1 | PCB | No Exceedances |
| BH1(MW) | 3.00-3.60 m | 20-4038-2 | Metals<br>PHC (F1-F4)<br>pH | No Exceedances<br>No Exceedances<br>8.3 |
| BH1(MW) | 4.55-5.15 m | 20-4038-3 | VOC | No Exceedances |
| BH1(MW) | 4.55-5.15 m | 20-4038-4 Duplicate | VOC | No Exceedances |
| BH2(MW) | 3.00-3.60 m | 20-4038-5 | Metals<br>PHC (F1-F4) | No Exceedances<br>No Exceedances |
| BH2(MW) | 4.55-5.15 m | 20-4038-6 | VOC<br>pH | No Exceedances<br>8.3 |

| Borehole | Sample Depth | Sample # | Parameters Analyzed | Exceedances of April 15, 2011 Table 3 MOE Standards, Residential/Parkland/Institutional Property Use (R/P/I) Non-Potable Groundwater condition |
|---|---|---|---|---|
| BH3(MW) | 3.00-3.60 m | 20-4038-7 | Metals<br>PHC (F1-F4) | No Exceedances<br>No Exceedances |
| BH3(MW) | 3.00-3.60 m | 20-4038-8 Duplicate | Metals<br>PHC (F1-F4) | No Exceedances<br>No Exceedances |
| BH3(MW) | 4.55-5.15 m | 20-4038-9 | VOC | No Exceedances |
| **Groundwater (20-4070) - February 9, 2020** | | | | |
| BH2(MW) | Groundwater | 20-4070-1 | VOC | No Exceedances |
| BH3(MW) | Groundwater | 20-4070-2 | VOC | No Exceedances |
| **Groundwater (20-4114) - February 19, 2020** | | | | |
| BH1(MW) | Groundwater | 20-4114-1 | Metals<br>PHC (F1-F4)<br>VOC<br>PCB | No Exceedances<br>No Exceedances<br>No Exceedances<br>No Exceedances |
| BH2(MW) | Groundwater | 20-4114-2 | Metals<br>PHC (F1-F4) | No Exceedances<br>No Exceedances |
| BH3(MW) | Groundwater | 20-4114-3 | Metals<br>PHC (F1-F4)<br>VOC | No Exceedances<br>No Exceedances<br>No Exceedances |
| BH3(MW) | Groundwater | 20-4114-4 Duplicate | Metals<br>PHC (F1-F4) | No Exceedances<br>No Exceedances |

NOTES: PHC (F1-F4)*: Petroleum Hydrocarbons fractions (F1-F4)
F1 (C6-C10) Gasoline less BTEX
F2 (C10-C16) Diesel
F3 (C16-C34) Diesel
F4 (C34-C50) Heavy Oil
VOC: Volatile Organic Compounds, PCB: Polychlorinated Biphenyls, pH: potential of Hydrogen,
**Bold**: Exceeds the MOE Standards

*For a site to meet this standard there must be no evidence of free product, including but not limited to, visible petroleum hydrocarbon film or sheen present on any groundwater samples.

### 7.2.3. Metals

Four (4) soil and four (4) groundwater samples were submitted for Metals analysis.

**Soil & Groundwater**

The results of chemical analysis for Metals parameters in the submitted soil and groundwater samples were found to be in compliance with the applicable MOE Standards.

### 7.2.4. Petroleum Hydrocarbons (PHC)

Four (4) soil and four (4) groundwater samples were submitted for PHC (F1-F4) analysis.

**Soil & Groundwater**

The results of chemical analysis for PHC (F1-F4) parameters in the submitted soil and groundwater were found to be in compliance with the applicable MOE Standards.

### 7.2.5. Volatile Organic Compounds (VOC)

Four (4) soil and four (4) groundwater samples were submitted for VOC analysis.

**Soil & Groundwater**

The results of chemical analysis for VOC parameters in the submitted soil and groundwater samples were found to be in compliance with the applicable MOE Standards.

### 7.2.6. Polychlorinated Biphenyls (PCB)

One (1) soil and one (1) groundwater samples were submitted for PCB analysis.

**Soil & Groundwater**

The results of chemical analysis for PCB parameters in the submitted soil and groundwater samples were found to be in compliance with the applicable MOE Standards.

### 7.2.7. pH

Two (2) soil samples were submitted to the laboratory for pH analysis. The result of pH for the submitted soil samples were found to be within the recommended range of 5 to 9 (for surface samples) or 5 to 11 (for subsurface samples).

## *7.3. Quality Assurance/Quality Control*

A chain of custody form was filled out for all samples prior to submitting to the laboratory. The chain of custody documented movement from selection of the sample to receipt at the laboratory and provided sample identification, requested analysis, and condition of samples upon arrival at the laboratory.

The laboratory checks randomly selected samples for Quality Assurance. Generally, one sample for every twenty samples submitted is selected for Quality Assurance checks. For each parameter, there is an acceptable upper and lower limit for the measured concentration of the parameter. Measured concentrations of analyzed samples must fall within the upper and lower acceptable limits in order for the sample to be valid. If the result exceeds the upper or lower acceptable limits, the sample must be re-analyzed.

Based on Quality Assurance Reports provided by Fisher Environmental Laboratories, measured concentrations in soil samples were within the acceptable limits for quality control. Copies of the QA/QC Reports for Metals, PHC (F1-F4) and VOC in soil and groundwater are included with the Certificates of Analysis in Appendix C.

The QA/QC program also includes the collection of field duplicate samples for laboratory analysis as follows:

- One (1) field duplicate soil sample of BH1 (4.55-5.15 m bgs), analyzed for VOC;
- One (1) field duplicate soil sample of BH3 (3.00-3.60 m bgs), analyzed for Metals and PHC (F1-F4); and
- One (1) field duplicate groundwater sample BH3(MW), analyzed for Metals and PHC (F1-F4).

Relative percent differences (RPDs) were calculated for the field duplicate samples. Quantitative correlation was not calculable for the analytical results of the field duplicate samples and their corresponding sample pairs with reported concentrations equal to or less than five times the reportable detection limits.

Acceptable correlation was observed between all analytical results for the field duplicate soil and groundwater samples.

# 8. SUMMARY AND CONCLUSIONS

- Fisher carried out a Phase II Environmental Site Assessment of the property located at 86 Thomas Street, Mississauga, Ontario. The subsurface soil and groundwater investigation was carried out between February 5 and 19, 2020.

- Three (3) boreholes were advanced in the investigated property to depths of up to 5.6 m bgs, and in three (3) of them, BH1(MW), BH2(MW) and BH3(MW), monitoring wells were installed to facilitate groundwater level monitoring and sampling.

- On the basis of the boreholes completed, the stratigraphy at the investigated areas of the Site generally consists of brown to grey clayey silt till to up to 5.60 bgs, underlying by very dense soil most likely bedrock.

- Groundwater static level measurement was taken at the monitoring well locations on February 19, 2020, and it was noted at depths ranging from 2.03 m bgs in BH2(MW) to 4.85 m bgs in BH1(MW). Based on the static water levels measured in three (3) monitoring wells, the local groundwater flow direction was determined to be northeast.

- Nine (9) soil and six (6) groundwater samples were submitted to the laboratory for Metals, PHC (F1-F4), PCB, VOC, and/or pH analysis.

- The results of chemical analysis for all nine (9) submitted soil samples were found to be in compliance the applicable MOE standards.

- The results of chemical analysis for all six (6) submitted groundwater samples were found to be in compliance with the applicable MOE standards.

Based on the current subsurface investigation, it is concluded that no evidence of soil and groundwater contamination has occurred at the selected sampling locations. No further investigation is recommended at this time.

# 9. LIMITATIONS

This report was prepared for use by Mr. Rocco Forgione, and is based on the work as described in the Scope of Work. The conclusions presented in this report reflect existing Site conditions within the scope of this assignment.

No investigation method can completely eliminate the possibility of obtaining partially imprecise or incomplete information. It can only reduce the possibility to an acceptable level. Professional judgment was exercised in gathering and analyzing the information obtained and the formulation of the conclusions and recommendations. Like all professional persons rendering advice, we do not act as absolute insurers of the conclusions reached, but commit ourselves to care and competence in reaching those conclusions. Where a Phase II ESA is conducted without the completion of a current Phase I ESA, it is noted that the selected test locations are based on information made readily available to Fisher and/or a cursory review of current site operations. In such instances, knowledge of historical and/or neighbouring property use data may be significantly limited. No warranty, whether expressed or implied, is included or intended in this report.

The scope of services performed may not be appropriate for the purposes of other users. This report should not be used in contexts other than pertaining to the evaluation of the property at the current time. Written authorization must be obtained from Fisher Environmental Ltd. prior to use by any other parties, or any future use of this document or its findings, conclusions, or recommendations represented herein. Any use which a third party makes of this report, or any reliance on or decisions made on the basis of it, are the responsibility of the third parties. Fisher Environmental Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Fisher Environmental Ltd. notes that the work conducted at the Site may not fully satisfy the MOE (currently MECP) requirements for the purpose of filling a Record of Site Condition (RSC). Should a RSC be required, then additional investigations should be conducted at the Site.

# 10. QUALIFICATIONS OF ASSESSOR

The field works and report preparation for this assessment were conducted by Mrs. Larissa Sakhnenko, who has been trained and has 22 years of experience in conducting Phase II ESAs in accordance with the CSA Standard. Mrs. Sakhnenko has conducted more than 300 Phase II ESAs for commercial/industrial/residential clients and government agencies and is routinely engaged in this field.

As a Qualified Person who conducts and supervises Phase II ESAs, Mr. David Fisher, president of Fisher Environmental Ltd., is a senior Managerial and Environmental Engineering Specialist with over 30 years of progressive, innovative experience in the Petrochemical and Environmental Engineering Industry. Mr. Fisher is responsible for the development and management of a progressive environmental consulting engineering company specializing in environmental site assessments and remediation, geotechnical and hydrogeological investigations, tank removals, PCB waste treatment, land reclamation, recycling, hazardous waste disposal, and associated laboratory analytical practices.

Fisher Environmental Ltd. has been established as a team of engineers and consultants since 1989, and continues to develop a strong, wide client base. The company is staffed with personnel holding graduate or postgraduate qualifications at the Markham headquarters, as well as specialist associates offering a broad range of expertise and knowledge in environmental consulting. With a background in the petroleum industry, extensive experience has been gained in the prevention and cleanup of contamination in air, water and soil.

# 11. REFERENCES

The Phase II ESA was conducted in accordance with the applicable Regulations, Guidelines, Policies, Standards, Protocols and Objectives administrated by the Ontario Ministry of the Environment. Specific reference is made to the following:


- CAN/CSA Standard Z769-00 (reaffirmed in 2013), Phase II Environmental Site Assessment, A National Standard of Canada;
- "Guidance on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario" Ministry of the Environment and Energy, December 1996;
- Environmental Protection Act, RSO 1990, Charter E. 19, as amended, September 2004;
- "Soil, Ground Water and Sediment Standards for Use under Part XV.1 of the Environmental Protection Act", Ministry of the Environment, dated April 15, 2011;
- The Ontario Water Resources Act – R.R.O. 1990, Regulation 903 – Amended to O. Reg. 128.03, August 2003;
- Quaternary Geology of Toronto and Surrounding Area, Southern Ontario; Ontario Geological Survey Preliminary Map P 2204, Geological Series, Sharpe, D.R., 1980;
- Google Earth;
- Phase I ESA, 86 Thomas Street, Mississauga, ON, dated January 12, 2010, prepared by Terraprobe, Project Number 1-09-4325.

# APPENDIX A – SITE LOCATION MAP AND SITE PLAN WITH BOREHOLE LOCATIONS AND REGIONAL PHGYSIOGRAPHIC MAPS



**Fisher Environmental Ltd.**

400 Esna Park Dr., #15
Markham, Ontario
L3R 3K2

Tel: 905 475-7755
Fax: 905 475-7718


KEY PLAN

N

LEGEND

PROJECT NAME AND ADDRESS

PHASE II ESA
86 Thomas Street,
Mississauga, ON

PROJECT NO.
FE-P 20-10069

DATE
5 FEBRUARY 2020

SCALE
AS SHOWN

FIGURE: A

SITE LOCATION MAP.


**Fisher Environmental Ltd.**
400 Esna Park Dr. #15
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Fax: 905 475-7718

KEY PLAN

LEGEND

Borehole/Monitoring Well Location by Fisher

PROJECT NAME AND ADDRESS

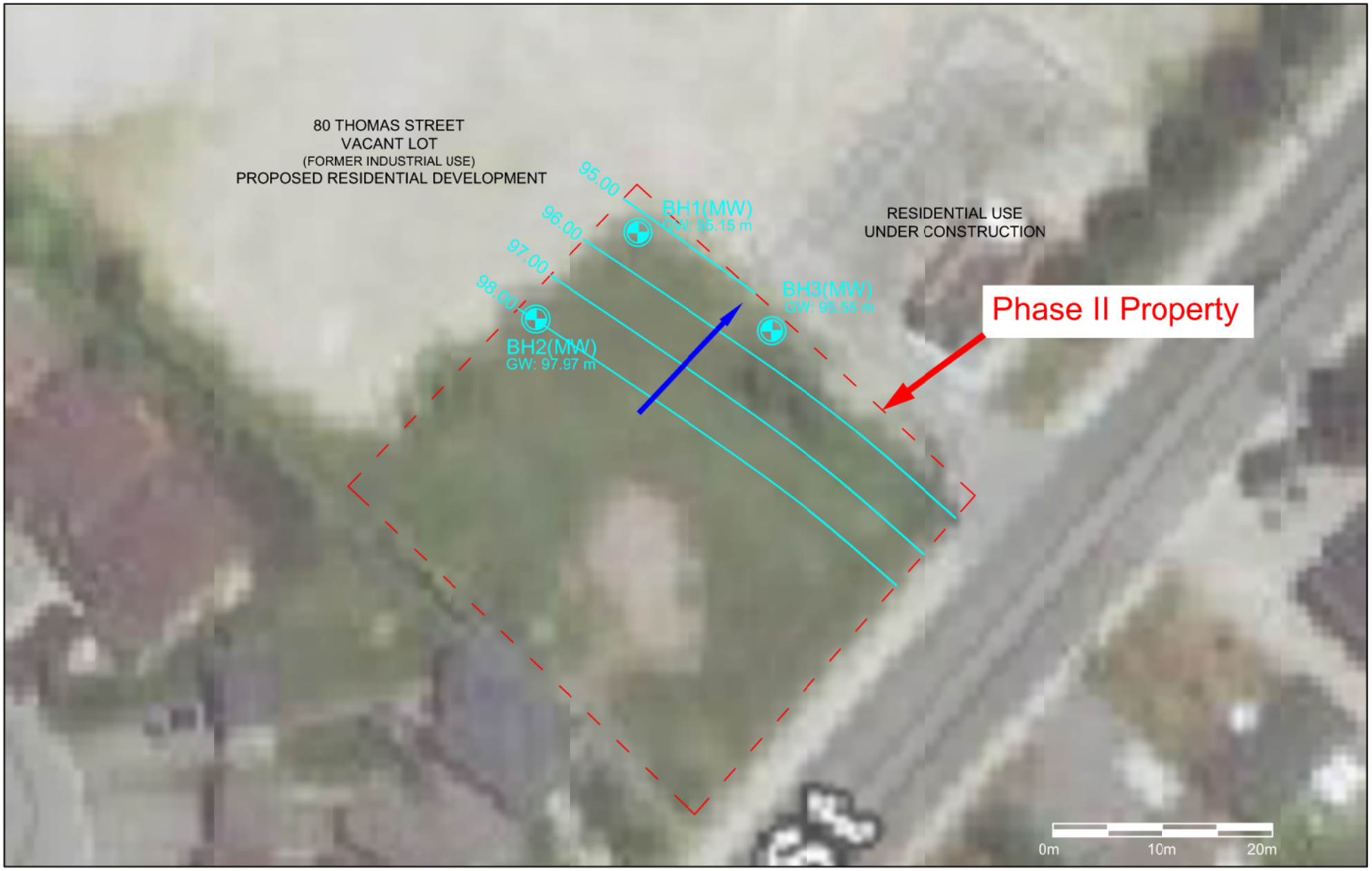
PHASE II ESA
86 Thomas Street,
Mississauga, ON

PROJECT NO. FE-P 20-10069

DATE 5 FEBRUARY 2020

SCALE AS SHOWN

FIGURE: 1
SITE PLAN with BOREHOLE/ MONITORING WELL LOCATIONS.




**Fisher Environmental Ltd.**

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Fax: 905 475-7718

KEY PLAN

LEGEND

Borehole/Monitoring Well Location by Fisher

Groundwater Flow Direction - NORTHEAST

PROJECT NAME AND ADDRESS

PHASE II ESA
86 Thomas Street,
Mississauga, ON

PROJECT NO. FE-P 20-10069

DATE 19 FEBRUARY 2020

SCALE AS SHOWN

FIGURE: 2
SITE PLAN with CONTOURS of GROUNDWATER ELEVATIONS and the INTERPRETED GROUNDWATER FLOW DIRECTION.



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KEY PLAN

LEGEND

PROJECT NAME AND ADDRESS

PHASE II ESA
86 Thomas Street,
Mississauga, ON

PROJECT NO.
FE-P 20-10069

DATE
5 FEBRUARY 2020

SCALE
AS SHOWN

FIGURE: B

TOPOGRAPHICAL MAP.



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KEY PLAN

N

LEGEND

3 **Young tills deposits 3b: *clayey silt till***

PROJECT NAME AND ADDRESS

PHASE II ESA
86 Thomas Street,
Mississauga, ON

PROJECT NO. FE-P 20-10069

DATE 5 FEBRUARY 2020

SCALE NSC

FIGURE: C

Surficial Geology.

# APPENDIX B – LOG OF BOREHOLES

| Fisher Environmental Ltd. | Log of Borehole: BH1(MW)<br>86 Thomas Street<br>Mississauga, Ontario | Sheet: 1 of 3<br>Project #: 20-10069<br>G.S.Elevation: |
|---|---|---|

Location: Northeast corner of the Site.

| | | | |
|---|---|---|---|
| Drill Method: | GeoProbe | Drilling Date: | February 5, 2020 |
| Sample Method: | Split Spoon | Dates: Water Level | February 19, 2020 |
| Borehole Diameter: | 4" | Water Level: 4.85 m bgs | Logged By: LS / Checked By: SF |

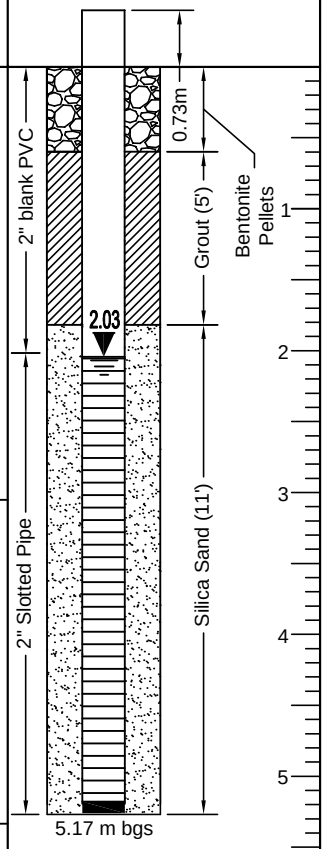
| DEPTH (meters) | Sample No. | Blow Counts | H.C.Vapour (ppm) | DEPTH (feet) | DEPTH (meters) | Materials Description | Monitoring Well Construction & Water Level (m) |
|---|---|---|---|---|---|---|---|
| 0 | 20-4038-1 | | 0.0 | 0 | 0 | brown Clayey Silt, dense, slightly moist | 0.83m; 2" blank PVC; Grout (5'); Bentonite Pellets |
| 1 | | | 0.0 | 2 | 1 | | |
| 2 | | | 0.0 | 4 | 1 | | |
| 3 | 20-4038-2 | | 0.0 | 6 | 2 | | |
| 4 | | | 0.0 | 8 | 2 | | |
| 5 | 20-4038-3<br>20-4038-4<br>(Duplicate) | | 0.0 | 10 | 3 | grey Silty Clay Till (Glacial Till), very stiff, dry | 2" Slotted Pipe; Silica Sand (11'); 4.85 |
| 6 | | | | 12 | 4 | | |
| 7 | | | | 14 | 4 | | |
| 8 | | | | 16 | 5 | | 5.14 m bgs |
| 9 | | | | 18 | 5 | | |
| 10 | | | | 20 | 6 | Auger Refusal on suspected bedrock at 5.80 m bgs | |
| | | | | 22 | 7 | | |
| | | | | 24 | 7 | | |
| | | | | 26 | 8 | | |
| | | | | 28 | 8 | | |
| | | | | 30 | 9 | | |
| | | | | 32 | 10 | | |

| Fisher Environmental Ltd. | Log of Borehole: BH2(MW)<br>86 Thomas Street<br>Mississauga, Ontario | Sheet: 2 of 3<br>Project #: 20-10069<br>G.S.Elevation: |
|---|---|---|

| | | | |
|---|---|---|---|
| Location: | Along north property line. | | |
| Drill Method: | GeoProbe | Drilling Date: | February 5, 2020 |
| Sample Method: | Split Spoon | Dates: Water Level | February 19, 2020 |
| Borehole Diameter: | 4" | Water Level: 2.03 m bgs | Logged By: LS / Checked By: SF |

| DEPTH (meters) | Sample No. | Blow Counts | H.C.Vapour (ppm) | DEPTH (feet) | DEPTH (meters) | Materials Description | Monitoring Well Construction & Water Level (m) |
|---|---|---|---|---|---|---|---|
| 0 | | | 0.0 | 0 | 0 | | |
| 1 | | | 0.0 | 2 | 0.5 | | |
| 2 | | | 0.0 | 4 | 1 | brown Clayey Silt, dense, slightly moist | |
| 3 | | | 0.0 | 6 | 1.5 | | |
| 4 | 20-4038-5 | | 0.0 | 8 | 2 | | |
| 5 | | | 0.0 | 10 | 2.5 | | |
| 6 | 20-4038-6 | | 0.0 | 12 | 3 | | |
| 7 | | | | 14 | 3.5 | grey Silty Clay Till (Glacial Till), very stiff, moist to very moist | |
| 8 | | | | 16 | 4 | | |
| 9 | | | | 18 | 4.5 | | |
| 10 | | | | 20 | 5 | | |
| | | | | 22 | 5.5 | | |
| | | | | 24 | 6 | | |
| | | | | 26 | 6.5 | | |
| | | | | 28 | 7 | | |
| | | | | 30 | 7.5 | | |
| | | | | 32 | 8 | | |
| | | | | | 8.5 | | |
| | | | | | 9 | | |
| | | | | | 9.5 | | |
| | | | | | 10 | | |

Auger Refusal on suspected bedrock at 5.30 m bgs



| Fisher Environmental Ltd. | Log of Borehole: BH2(MW)<br>86 Thomas Street<br>Mississauga, Ontario | Sheet: 3 of 3<br>Project #: 20-10069<br>G.S.Elevation: |
|---|---|---|

Location: Along east property line.

| | | | |
|---|---|---|---|
| Drill Method: | GeoProbe | Drilling Date: | February 5, 2020 |
| Sample Method: | Split Spoon | Dates: Water Level | February 9, 2020 |
| Borehole Diameter: | 4" | Water Level: 4.46 m bgs | Logged By: LS / Checked By: SF |

| DEPTH (meters) | Sample No. | Blow Counts | H.C.Vapour (ppm) | DEPTH (feet) | DEPTH (meters) | Materials Description | Monitoring Well Construction & Water Level (m) |
|---|---|---|---|---|---|---|---|
| 0 | | | 0.0 | 0 | 0 | | 0.92m |
| 1 | | | 0.0 | 2 | 1 | brown Clayey Silt, dense, moist to dry | 2" blank PVC |
| 2 | | | 0.0 | 4 | 1 | | Bentonite Pellets |
| 3 | | | 0.0 | 6 | 2 | | Grout (5') |
| 4 | 20-4038-7<br>20-4038-8<br>(Duplicate) | | 0.0 | 8 | 2 | | |
| 5 | | | 0.0 | 10 | 3 | | |
| 6 | 20-4038-9 | | 0.0 | 12 | 4 | grey Silty Clay Till (Glacial Till), very stiff, moist | 2" Slotted Pipe |
| 7 | | | | 14 | 4 | | Silica Sand (11') |
| 8 | | | | 16 | 5 | | 4.46 |
| 9 | | | | 18 | 5 | | |
| 10 | | | | 20 | 6 | Auger Refusal on suspected bedrock at 5.70 m bgs | 5.60 m bgs |
| | | | | 22 | 7 | | |
| | | | | 24 | 7 | | |
| | | | | 26 | 8 | | |
| | | | | 28 | 8 | | |
| | | | | 30 | 9 | | |
| | | | | 32 | 9 | | |
| | | | | | 10 | | |

# APPENDIX C – CERTIFICATES OF ANALYSIS

# FISHER ENVIRONMENTAL LABORATORIES

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***Client:*** Rocco Forgione
***Address:***

***Tel.:*** 416-736-4900
***Email:***
***Attn.:***

***F.E. Job #:*** 20-4038
***Project Name:*** 86 Thomas Street
***Project ID:*** FE-P 20-10069
***Date Sampled:*** 5-Feb-2020
***Date Received:*** 6-Feb-2020
***Date Reported:*** 27-Feb-2020
***Location:*** 86 Thomas Street
Mississauga, ON

# Certificate of Analysis

| Analyses | Matrix | Quantity | Date Extracted | Date Analyzed | Lab SOP | Method Reference |
|---|---|---|---|---|---|---|
| Metals | Soil | 4 | 11-Feb-20 | 11-Feb-20 | Metals F-18 | EPA 200.2/200.8 |
| VOCs | Soil | 4 | 7-Feb-20 | 26-Feb-20 | VOCs F-14 | SW-846, 8260C |
| PHCs (F1 & BTEX) | Soil | 4 | 7-Feb-20 | 26-Feb-20 | PHCs F-7 | CCME CWS |
| PHCs (F2 - F4) | Soil | 4 | 7-Feb-20 | 7-Feb-20 | PHCs F-7 | CCME CWS |
| PCBs | Soil | 1 | 20-Feb-20 | 20-Feb-20 | PCBs F-5 | SM 6630C |
| pH | Soil | 2 | 10-Feb-20 | 10-Feb-20 | pH-EC-SAR F-16 | SW-846, 9045D |
| Moisture Content | Soil | 9 | N/A | 10-Feb-20 | Support Procedures F-99 | Carter (1993) |

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

***Authorized by:***


*Roger Lin, Ph. D., C. Chem.*
*Laboratory Manager*



*Results related only to the items tested*

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs, pH |
| ***Sample Description:*** | 9 Soil Samples |

| **Parameter** | ***20-4038-2*** MW1 3.00-3.60m | ***20-4038-5*** MW2 3.00-3.60m | ***20-4038-7*** MW3 3.00-3.60m | ***20-4038-8*** MW3 (DUP) 3.00-3.60m | | **Soil Standards** [1] |
|---|---|---|---|---|---|---|
| | *Concentration (µg/g)* | | | | | |
| ***Metals in Soil*** | | | | | | |
| Antimony | <1 | <1 | <1 | <1 | | 7.5 |
| Arsenic | 4.9 | <1 | 4.1 | 1.9 | | 18 |
| Barium | 46 | 47 | 71 | 73 | | 390 |
| Beryllium | <2 | <2 | <2 | <2 | | (5) 4 |
| Boron | 6.2 | 6.0 | <5 | 6.8 | | 120 |
| Cadmium | <1 | <1 | <1 | 1.0 | | 1.2 |
| Chromium | 16 | 14 | 11 | 12 | | 160 |
| Cobalt | 10 | 8.5 | 9.6 | 7.6 | | 22 |
| Copper | 20 | 16 | 18 | 15 | | (180) 140 |
| Lead | <10 | <10 | <10 | <10 | | 120 |
| Molybdenum | <2 | <2 | <2 | <2 | | 6.9 |
| Nickel | 23 | 23 | 23 | 20 | | (130) 100 |
| Selenium | <1 | 1.7 | <1 | 1.7 | | 2.4 |
| Silver | <0.5 | <0.5 | <0.5 | <0.5 | | (25) 20 |
| Thallium | <1 | <1 | <1 | <1 | | 1 |
| Uranium | <1 | <1 | <1 | <1 | | 23 |
| Vanadium | 19 | 14 | 12 | 18 | | 86 |
| Zinc | 48 | 46 | 37 | 35 | | 340 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 2**: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use (**R/P/I**); ( ) Standard value in brackets applies to medium and fine textured soils.

# QA/QC Report

| Parameter | Blank | RL | CRM | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (µg/g) | | (µg/g) | | Recovery (%) | |
| ***Metals in Soil*** | | | | | | |
| Antimony | <1 | 1 | 1.4 | 0-10 | 108 | 70-130 |
| Arsenic | <1 | 1 | 77 | 25-125 | 100 | 70-130 |
| Barium | <5 | 5 | 216 | 149-281 | 111 | 70-130 |
| Beryllium | <2 | 2 | <2 | 0-5 | 109 | 70-130 |
| Boron | <5 | 5 | 8.2 | 5-20 | 88 | 70-130 |
| Cadmium | <1 | 1 | 2.2 | 0-5 | 102 | 70-130 |
| Chromium | <5 | 5 | 30 | 14-54 | 110 | 70-130 |
| Cobalt | <2 | 2 | 12 | 9-15 | 113 | 70-130 |
| Copper | <5 | 5 | 168 | 139-243 | 116 | 70-130 |
| Lead | <10 | 10 | 131 | 68-184 | 87 | 70-130 |
| Molybdenum | <2 | 2 | 3.3 | 0-5 | 107 | 70-130 |
| Nickel | <5 | 5 | 54 | 33-75 | 104 | 70-130 |
| Selenium | <1 | 1 | <1 | 0-5 | 93 | 70-130 |
| Silver | <0.5 | 0.5 | 1.1 | 0-5 | 91 | 70-130 |
| Thallium | <1 | 1 | <1 | 0-5 | 95 | 70-130 |
| Uranium | <1 | 1 | 1.2 | 0-5 | 117 | 70-130 |
| Vanadium | <10 | 10 | 24 | 17-51 | 92 | 70-130 |
| Zinc | <30 | 30 | 423 | 337-597 | 108 | 70-130 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***Metals in Soil*** | | | | | | |
| Antimony | 0.0 | 0-30 | | | | |
| Arsenic | 0.0 | 0-30 | | | | |
| Barium | 8.3 | 0-30 | | | | |
| Beryllium | 0.0 | 0-30 | | | | |
| Boron | 28 | 0-30 | | | | |
| Cadmium | 0.0 | 0-30 | | | | |
| Chromium | 3.8 | 0-30 | | | | |
| Cobalt | 7.3 | 0-30 | | | | |
| Copper | 1.4 | 0-30 | | | | |
| Lead | 29 | 0-30 | | | | |
| Molybdenum | 28 | 0-30 | | | | |
| Nickel | 0.0 | 0-30 | | | | |
| Selenium | 0.0 | 0-30 | | | | |
| Silver | 0.0 | 0-30 | | | | |
| Thallium | 0.0 | 0-30 | | | | |
| Uranium | 0.0 | 0-30 | | | | |
| Vanadium | 2.4 | 0-30 | | | | |
| Zinc | 0.0 | 0-30 | | | | |

***LEGEND:***
AR - Acceptable Range
RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs, pH |
| ***Sample Description:*** | 9 Soil Samples |

| **Parameter** | ***20-4038-3*** MW1 4.55-5.15m | ***20-4038-4*** MW1 (DUP) 4.55-5.15m | ***20-4038-6*** MW2 4.55-5.15m | ***20-4038-9*** MW3 4.55-5.15m | | **Soil Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration (µg/g)* | | | | | |
| ***VOCs in Soil*** | | | | | | |
| Acetone | <0.5 | <0.5 | <0.5 | <0.5 | | (28) 16 |
| Benzene | <0.02 | <0.02 | <0.02 | <0.02 | | (0.17) 0.21 |
| Bromodichloromethane | <0.05 | <0.05 | <0.05 | <0.05 | | (1.9) 1.5 |
| Bromoform | <0.05 | <0.05 | <0.05 | <0.05 | | (0.26) 0.27 |
| Bromomethane | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| Carbon Tetrachloride | <0.05 | <0.05 | <0.05 | <0.05 | | (0.12) 0.05 |
| Chlorobenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (2.7) 2.4 |
| Chloroform | <0.05 | <0.05 | <0.05 | <0.05 | | (0.18) 0.05 |
| Dibromochloromethane | <0.05 | <0.05 | <0.05 | <0.05 | | (2.9) 2.3 |
| 1,2-Dichlorobenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (1.7) 1.2 |
| 1,3-Dichlorobenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (6) 4.8 |
| 1,4-Dichlorobenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (0.097) 0.083 |
| Dichlordifluoromethane | <0.05 | <0.05 | <0.05 | <0.05 | | (25) 16 |
| 1,1-Dichloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | (0.6) 0.47 |
| 1,2-Dichloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| 1,1-Dichloroethylene | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| c-1,2-Dichloroethylene | <0.05 | <0.05 | <0.05 | <0.05 | | (2.5) 1.9 |
| t-1,2-Dichloroethylene | <0.05 | <0.05 | <0.05 | <0.05 | | (0.75) 0.084 |
| 1,2-Dichloropropane | <0.05 | <0.05 | <0.05 | <0.05 | | (0.085) 0.05 |
| 1,3-Dichloropropene (cis-+trans-) | <0.05 | <0.05 | <0.05 | <0.05 | | (0.081) 0.05 |
| Ethylbenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (1.6) 1.1 |
| Ethylene Dibromide | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| Hexane (n) | <0.05 | <0.05 | <0.05 | <0.05 | | (34) 2.8 |
| Methyl Ethyl Ketone | <0.5 | <0.5 | <0.5 | <0.5 | | (44) 16 |
| Methyl Isobutyl Ketone | <0.5 | <0.5 | <0.5 | <0.5 | | (4.3) 1.7 |
| Methyl tert-butyl Ether | <0.05 | <0.05 | <0.05 | <0.05 | | (1.4) 0.75 |
| Methylene Chloride | <0.05 | <0.05 | <0.05 | <0.05 | | (0.96) 0.1 |
| Styrene | <0.05 | <0.05 | <0.05 | <0.05 | | (2.2) 0.7 |
| 1,1,1,2-Tetrachloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | (0.05) 0.058 |
| 1,1,2,2-Tetrachloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| Tetrachloroethylene | <0.05 | <0.05 | <0.05 | <0.05 | | (2.3) 0.28 |
| Toluene | <0.2 | <0.2 | <0.2 | <0.2 | | (6) 2.3 |
| 1,1,1-Trichloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | (3.4) 0.38 |
| 1,1,2-Trichloroethane | <0.05 | <0.05 | <0.05 | <0.05 | | 0.05 |
| Trichloroethylene | <0.05 | <0.05 | <0.05 | <0.05 | | (0.52) 0.061 |
| Trichlorofluoromethane | <0.05 | <0.05 | <0.05 | <0.05 | | (5.8) 4 |
| Vinyl Chloride | <0.02 | <0.02 | <0.02 | <0.02 | | (0.022) 0.02 |
| Xylenes | <0.05 | <0.05 | <0.05 | <0.05 | | (25) 3.1 |
| ***Surrogate Recovery (%)*** | | | | | | |
| 1,2-Dichloroethane-d4 | 76 | 76 | 85 | 87 | | 50-140 |
| Toluene-d8 | 63 | 69 | 68 | 65 | | 50-140 |
| 4-Bromofluorobenzene | 103 | 101 | 96 | 140 | | 50-140 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 2**: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use (**R/P/I**); ( ) Standard value in brackets applies to medium and fine textured soils.

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (µg/g) | | Recovery (%) | | Recovery (%) | |
| ***VOCs in Soil*** | | | | | | |
| Acetone | <0.5 | 0.5 | 114 | 50-140 | 122 | 50-140 |
| Benzene | <0.02 | 0.02 | 97 | 60-130 | 103 | 50-140 |
| Bromodichloromethane | <0.05 | 0.05 | 97 | 50-140 | 101 | 50-140 |
| Bromoform | <0.05 | 0.05 | 97 | 60-130 | 102 | 50-140 |
| Bromomethane | <0.05 | 0.05 | 90 | 50-140 | 104 | 50-140 |
| Carbon Tetrachloride | <0.05 | 0.05 | 103 | 60-130 | 110 | 50-140 |
| Chlorobenzene | <0.05 | 0.05 | 101 | 60-130 | 89 | 50-140 |
| Chloroform | <0.05 | 0.05 | 94 | 60-130 | 110 | 50-140 |
| Dibromochloromethane | <0.05 | 0.05 | 94 | 60-130 | 96 | 50-140 |
| 1,2-Dichlorobenzene | <0.05 | 0.05 | 86 | 60-130 | 106 | 50-140 |
| 1,3-Dichlorobenzene | <0.05 | 0.05 | 92 | 60-130 | 94 | 50-140 |
| 1,4-Dichlorobenzene | <0.05 | 0.05 | 101 | 60-130 | 82 | 50-140 |
| Dichlordifluoromethane | <0.05 | 0.05 | 87 | 50-140 | 66 | 50-140 |
| 1,1-Dichloroethane | <0.05 | 0.05 | 101 | 60-130 | 109 | 50-140 |
| 1,2-Dichloroethane | <0.05 | 0.05 | 98 | 60-130 | 96 | 50-140 |
| 1,1-Dichloroethylene | <0.05 | 0.05 | 116 | 60-130 | 105 | 50-140 |
| c-1,2-Dichloroethylene | <0.05 | 0.05 | 104 | 60-130 | 104 | 50-140 |
| t-1,2-Dichloroethylene | <0.05 | 0.05 | 102 | 60-130 | 105 | 50-140 |
| 1,2-Dichloropropane | <0.05 | 0.05 | 105 | 60-130 | 110 | 50-140 |
| 1,3-Dichloropropene (cis-+trans-) | <0.05 | 0.05 | 106 | 60-130 | 97 | 50-140 |
| Ethylbenzene | <0.05 | 0.05 | 96 | 60-130 | 93 | 50-140 |
| Ethylene Dibromide | <0.05 | 0.05 | 96 | 60-130 | 92 | 50-140 |
| Hexane (n) | <0.05 | 0.05 | 77 | 60-130 | 71 | 50-140 |
| Methyl Ethyl Ketone | <0.5 | 0.5 | 91 | 50-140 | 106 | 50-140 |
| Methyl Isobutyl Ketone | <0.5 | 0.5 | 122 | 50-140 | 124 | 50-140 |
| Methyl tert-butyl Ether | <0.05 | 0.05 | 115 | 60-130 | 85 | 50-140 |
| Methylene Chloride | <0.05 | 0.05 | 87 | 60-130 | 101 | 50-140 |
| Styrene | <0.05 | 0.05 | 117 | 60-130 | 106 | 50-140 |
| 1,1,1,2-Tetrachloroethane | <0.05 | 0.05 | 91 | 60-130 | 96 | 50-140 |
| 1,1,2,2-Tetrachloroethane | <0.05 | 0.05 | 94 | 60-130 | 102 | 50-140 |
| Tetrachloroethylene | <0.05 | 0.05 | 98 | 60-130 | 90 | 50-140 |
| Toluene | <0.2 | 0.2 | 96 | 60-130 | 90 | 50-140 |
| 1,1,1-Trichloroethane | <0.05 | 0.05 | 106 | 60-130 | 102 | 50-140 |
| 1,1,2-Trichloroethane | <0.05 | 0.05 | 90 | 60-130 | 85 | 50-140 |
| Trichloroethylene | <0.05 | 0.05 | 103 | 60-130 | 104 | 50-140 |
| Trichlorofluoromethane | <0.05 | 0.05 | 135 | 50-140 | 120 | 50-140 |
| Vinyl Chloride | <0.02 | 0.02 | 93 | 50-140 | 94 | 50-140 |
| Xylenes | <0.05 | 0.05 | 97 | 60-130 | 92 | 50-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| 1,2-Dichloroethane-d4 | 79 | 60-140 | 81 | 60-140 | 69 | 60-140 |
| Toluene-d8 | 78 | 60-140 | 65 | 60-140 | 78 | 60-140 |
| 4-Bromofluorobenzene | 111 | 60-140 | 82 | 60-140 | 100 | 60-140 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

***Client:*** Rocco Forgione ***F.E. Job #:*** 20-4038

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***VOCs in Soil*** | | | | | | |
| Acetone | 0.0 | 0-50 | | | | |
| Benzene | 0.0 | 0-50 | | | | |
| Bromodichloromethane | 0.0 | 0-50 | | | | |
| Bromoform | 0.0 | 0-50 | | | | |
| Bromomethane | 0.0 | 0-50 | | | | |
| Carbon Tetrachloride | 0.0 | 0-50 | | | | |
| Chlorobenzene | 0.0 | 0-50 | | | | |
| Chloroform | 0.0 | 0-50 | | | | |
| Dibromochloromethane | 0.0 | 0-50 | | | | |
| 1,2-Dichlorobenzene | 0.0 | 0-50 | | | | |
| 1,3-Dichlorobenzene | 0.0 | 0-50 | | | | |
| 1,4-Dichlorobenzene | 0.0 | 0-50 | | | | |
| Dichlordifluoromethane | 0.0 | 0-50 | | | | |
| 1,1-Dichloroethane | 0.0 | 0-50 | | | | |
| 1,2-Dichloroethane | 0.0 | 0-50 | | | | |
| 1,1-Dichloroethylene | 0.0 | 0-50 | | | | |
| c-1,2-Dichloroethylene | 0.0 | 0-50 | | | | |
| t-1,2-Dichloroethylene | 0.0 | 0-50 | | | | |
| 1,2-Dichloropropane | 0.0 | 0-50 | | | | |
| 1,3-Dichloropropene (cis-+trans-) | 0.0 | 0-50 | | | | |
| Ethylbenzene | 0.0 | 0-50 | | | | |
| Ethylene Dibromide | 0.0 | 0-50 | | | | |
| Hexane (n) | 0.0 | 0-50 | | | | |
| Methyl Ethyl Ketone | 0.0 | 0-50 | | | | |
| Methyl Isobutyl Ketone | 0.0 | 0-50 | | | | |
| Methyl tert-butyl Ether | 0.0 | 0-50 | | | | |
| Methylene Chloride | 0.0 | 0-50 | | | | |
| Styrene | 0.0 | 0-50 | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0 | 0-50 | | | | |
| 1,1,2,2-Tetrachloroethane | 0.0 | 0-50 | | | | |
| Tetrachloroethylene | 0.0 | 0-50 | | | | |
| Toluene | 16 | 0-50 | | | | |
| 1,1,1-Trichloroethane | 0.0 | 0-50 | | | | |
| 1,1,2-Trichloroethane | 0.0 | 0-50 | | | | |
| Trichloroethylene | 0.0 | 0-50 | | | | |
| Trichlorofluoromethane | 0.0 | 0-50 | | | | |
| Vinyl Chloride | 0.0 | 0-50 | | | | |
| Xylenes | 0.0 | 0-50 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| 1,2-Dichloroethane-d4 | 78 | 60-140 | | | | |
| Toluene-d8 | 65 | 60-140 | | | | |
| 4-Bromofluorobenzene | 97 | 60-140 | | | | |

***LEGEND:***

AR - Acceptable Range

RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs, pH |
| ***Sample Description:*** | 9 Soil Samples |

| **Parameter** | ***20-4038-2*** MW1 3.00-3.60m | ***20-4038-5*** MW2 3.00-3.60m | ***20-4038-7*** MW3 3.00-3.60m | ***20-4038-8*** MW3 (DUP) 3.00-3.60m | | **Soil Standards** [1] |
|---|---|---|---|---|---|---|
| | *Concentration (µg/g)* | | | | | |
| ***BTEX in Soil*** | | | | | | |
| Benzene | <0.02 | <0.02 | <0.02 | <0.02 | | (0.17) 0.21 |
| Toluene | <0.2 | <0.2 | <0.2 | <0.2 | | (6) 2.3 |
| Ethylbenzene | <0.05 | <0.05 | <0.05 | <0.05 | | (1.6) 1.1 |
| Xylenes | <0.05 | <0.05 | <0.05 | <0.05 | | (25) 3.1 |
| ***PHCs ($F_1$-$F_4$) in Soil*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | <10 | <10 | <10 | <10 | | (65) 55 |
| F2 ($C_{10}$ - $C_{16}$) | <10 | <10 | <10 | <10 | | (150) 98 |
| F3 ($C_{16}$ - $C_{34}$) | <50 | <50 | <50 | <50 | | (1300) 300 |
| F4 ($C_{34}$-$C_{50}$) | <50 | <50 | <50 | <50 | | (5600) 2800 |
| Chromatogram descends to baseline by nC50 ? (Yes/No) | Yes | Yes | Yes | Yes | | |
| ***Surrogate Recovery (%)*** | | | | | | |
| 1,2-Dichloroethane-d4 | 99 | 74 | 79 | 61 | | 60-140 |
| Toluene-d8 | 60 | 63 | 62 | 73 | | 60-140 |
| 4-Bromofluorobenzene | 74 | 122 | 117 | 107 | | 60-140 |

$F_{4G}$ (gravimetric heavy hydrocarbons) cannot be added to the $C_6$ to $C_{50}$ hydrocarbons.

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 2**: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

Residential/Parkland/Institutional Property Use (**R/P/I**); ( ) Standard value in brackets applies to medium and fine textured soils.

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (µg/g) | | Recovery (%) | | Recovery (%) | |
| ***BTEX in Soil*** | | | | | | |
| Benzene | <0.02 | 0.02 | 97 | 60-130 | 103 | 50-140 |
| Toluene | <0.2 | 0.2 | 96 | 60-130 | 90 | 50-140 |
| Ethylbenzene | <0.05 | 0.05 | 96 | 60-130 | 93 | 50-140 |
| Xylenes | <0.05 | 0.05 | 97 | 60-130 | 92 | 50-140 |
| ***PHCs ($F_1$-$F_4$) in Soil*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | <10 | 10 | 96 | 80-120 | 90 | 60-140 |
| F2 ($C_{10}$ - $C_{16}$) | <10 | 10 | 95 | 80-120 | 117 | 60-140 |
| F3 ($C_{16}$ - $C_{34}$) | <50 | 50 | 98 | 80-120 | 116 | 60-140 |
| F4 ($C_{34}$-$C_{50}$) | <50 | 50 | 89 | 80-120 | 106 | 60-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| 1,2-Dichloroethane-d4 | 79 | 60-140 | 81 | 60-140 | 69 | 60-140 |
| Toluene-d8 | 78 | 60-140 | 65 | 60-140 | 78 | 60-140 |
| 4-Bromofluorobenzene | 111 | 60-140 | 82 | 60-140 | 100 | 60-140 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range
BTEX should be subtracted from $F_1$, Naphthalene from $F_2$ and selected PAHs from $F_3$ if BTEX/PAHs are analyzed, then report $F_{1\text{-BTEX}}$, $F_{2\text{-Naph.}}$ and $F_{3\text{-PAH}}$. $nC_{50}$ response factor was within 70% of $nC_{10}$+$nC_{16}$+$nC_{34}$ average.

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***BTEX in Soil*** | | | | | | |
| Benzene | 0.0 | 0-50 | | | | |
| Toluene | 16 | 0-50 | | | | |
| Ethylbenzene | 0.0 | 0-50 | | | | |
| Xylenes | 0.0 | 0-50 | | | | |
| ***PHCs ($F_1$-$F_4$) in Soil*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | 7.5 | 0-30 | | | | |
| F2 ($C_{10}$ - $C_{16}$) | 0.0 | 0-30 | | | | |
| F3 ($C_{16}$ - $C_{34}$) | 11 | 0-30 | | | | |
| F4 ($C_{34}$-$C_{50}$) | 0.0 | 0-30 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| 1,2-Dichloroethane-d4 | 78 | 60-140 | | | | |
| Toluene-d8 | 65 | 60-140 | | | | |
| 4-Bromofluorobenzene | 97 | 60-140 | | | | |

***LEGEND:***

AR - Acceptable Range

RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, PHCs, VOCs, PAHs, PCBs, pH, EC, SAR |
| ***Sample Description:*** | 1 Soil Sample (Rush) |

| **Parameter** | ***20-4038-1*** MW1 0.0-0.60m | | | | | **Soil Standards [1] Table 2 R/P/I** |
|---|---|---|---|---|---|---|
| | *Concentration (µg/g)* | | | | | |
| ***PCBs in Soil*** | <0.02 | | | | | 0.35 |
| ***Surrogate Recovery (%)*** | | | | | | |
| Decachlorobiphenyl | 83 | | | | | 60-140 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

# QA/QC Report

| **Parameter** | **Blank** | **RL** | **LCS** | **AR** | **MS** | **AR** |
|---|---|---|---|---|---|---|
| | **(µg/g)** | | **Recovery (%)** | | **Recovery (%)** | |
| ***PCBs in Soil*** | <0.02 | 0.02 | 90 | 60-140 | 95 | 60-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| Decachlorobiphenyl | 91 | 60-140 | 96 | 60-140 | 105 | 60-140 |

| **Parameter** | **Duplicate** | **AR** | | | | |
|---|---|---|---|---|---|---|
| | **RPD (%)** | | | | | |
| ***PCBs in Soil*** | 0.0 | 0-40 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| Decachlorobiphenyl | 88 | 60-140 | | | | |

***LEGEND:***

RL - Reporting Limit

LCS - Laboratory Control Sample

MS - Matrix Spike

AR - Acceptable Range

RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs, pH |
| ***Sample Description:*** | 9 Soil Samples |

| **Parameter** | ***20-4038-2*** MW1 3.00-3.60m | ***20-4038-6*** MW2 4.55-5.15m | | | | **Soil Standards** * |
|---|---|---|---|---|---|---|
| ***pH*** *(pH unit)* | 8.3 | 8.3 | | | | (5-11) 5-9 |

* Surface soil pH value from 5 - 9, Sub-surface soil pH value from 5-11.

# QA/QC Report

| **Parameter** | **LCS** | **AR** | **Duplicate** | **AR** | | |
|---|---|---|---|---|---|---|
| | **Absolute Difference** *(pH Unit)* | | | | | |
| ***pH*** *(pH unit)* | 7.06 | 6.90-7.20 | 0.03 | <0.3 | | |

***LEGEND:***
LCS - Laboratory Control Sample
AR - Acceptable Range

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs, pH |
| ***Sample Description:*** | 9 Soil Samples |

| **Parameter** | ***20-4038-1*** MW1 0.0-0.60m | ***20-4038-2*** MW1 3.00-3.60m | ***20-4038-3*** MW1 4.55-5.15m | ***20-4038-4*** MW1 (DUP) 4.55-5.15m | ***20-4038-5*** MW2 3.00-3.60m | ***20-4038-6*** MW2 4.55-5.15m |
|---|---|---|---|---|---|---|
| ***Moisture Content (%)*** | 12 | 11 | 12 | 10 | 14 | 14 |

| **Parameter** | ***20-4038-7*** MW3 3.00-3.60m | ***20-4038-8*** MW3 (DUP) 3.00-3.60m | ***20-4038-9*** MW3 4.55-5.15m | | | |
|---|---|---|---|---|---|---|
| ***Moisture Content (%)*** | 11 | 11 | 11 | | | |

# QA/QC Report

| **Parameter** | **Blank** | **RL** | **LCS** | **AR** | **Duplicate** | **AR** |
|---|---|---|---|---|---|---|
| | | | **Recovery (%)** | | **RPD (%)** | |
| ***Moisture Content (%)*** | <0.1 | 0.1 | 100 | 70-130 | 3.9 | 0-20 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
AR - Acceptable Range
RPD - Relative Percent Difference

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***Client:*** Rocco Forgione
***Address:***

***Tel.:*** 416-736-4900
***Email:***
***Attn.:***

***F.E. Job #:*** 20-4070
***Project Name:*** 86 Thomas Street
***Project ID:*** FE-P 20-10069
***Date Sampled:*** 9-Feb-2020
***Date Received:*** 10-Feb-2020
***Date Reported:*** 13-Feb-2020
***Location:*** 86 Thomas Street
Mississauga, ON

# Certificate of Analysis

| Analyses | Matrix | Quantity | Date Extracted | Date Analyzed | Lab SOP | Method Reference |
|---|---|---|---|---|---|---|
| VOCs | Water | 2 | N/A | 11-Feb-20 | VOCs F-6 | SM 6200-B |

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

***Authorized by:***


*Roger Lin, Ph. D., C. Chem.*
*Laboratory Manager*



*Results related only to the items tested*

***Client:*** Rocco Forgione ***F.E. Job #:*** 20-4070

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | VOCs |
| ***Sample Description:*** | 2 Water Samples (***Semi-Rush*** ) |

| **Parameter** | ***20-4070-1*** MW2 | ***20-4070-2*** MW3 | | | | **Ground Water Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration ( µ g/L)* | | | | | |
| ***VOCs in Water*** | | | | | | |
| Acetone | <0.5 | <0.5 | | | | 2700 |
| Benzene | <0.02 | <0.02 | | | | 5 |
| Bromodichloromethane | <0.05 | <0.05 | | | | 16 |
| Bromoform | <0.05 | <0.05 | | | | 25 |
| Bromomethane | <0.05 | <0.05 | | | | 0.89 |
| Carbon Tetrachloride | <0.05 | <0.05 | | | | (5) 0.79 |
| Chlorobenzene | <0.05 | <0.05 | | | | 30 |
| Chloroform | <0.05 | <0.05 | | | | (22) 2.4 |
| Dibromochloromethane | <0.05 | <0.05 | | | | 25 |
| 1,2-Dichlorobenzene | <0.05 | <0.05 | | | | 3 |
| 1,3-Dichlorobenzene | <0.05 | <0.05 | | | | 59 |
| 1,4-Dichlorobenzene | <0.05 | <0.05 | | | | 1 |
| Dichlordifluoromethane | <0.05 | <0.05 | | | | 590 |
| 1,1-Dichloroethane | <0.05 | <0.05 | | | | 5 |
| 1,2-Dichloroethane | <0.05 | <0.05 | | | | (5) 1.6 |
| 1,1-Dichloroethylene | <0.05 | <0.05 | | | | (14) 1.6 |
| c-1,2-Dichloroethylene | <0.05 | <0.05 | | | | (17) 1.6 |
| t-1,2-Dichloroethylene | <0.05 | <0.05 | | | | (17) 1.6 |
| 1,2-Dichloropropane | <0.05 | <0.05 | | | | 5 |
| 1,3-Dichloropropene (cis-+trans- | <0.05 | <0.05 | | | | 0.5 |
| Ethylbenzene | <0.05 | <0.05 | | | | 2.4 |
| Ethylene Dibromide | <0.05 | <0.05 | | | | 0.2 |
| Hexane (n) | <0.05 | <0.05 | | | | (520) 51 |
| Methyl Ethyl Ketone | <0.5 | <0.5 | | | | 1800 |
| Methyl Isobutyl Ketone | <0.5 | <0.5 | | | | 640 |
| Methyl tert-butyl Ether | <0.05 | <0.05 | | | | 15 |
| Methylene Chloride | <0.05 | <0.05 | | | | 50 |
| Styrene | <0.05 | <0.05 | | | | 5.4 |
| 1,1,1,2-Tetrachloroethane | <0.05 | <0.05 | | | | 1.1 |
| 1,1,2,2-Tetrachloroethane | <0.05 | <0.05 | | | | 1 |
| Tetrachloroethylene | <0.05 | <0.05 | | | | (17) 1.6 |
| Toluene | <0.2 | <0.2 | | | | 24 |
| 1,1,1-Trichloroethane | <0.05 | <0.05 | | | | 200 |
| 1,1,2-Trichloroethane | <0.05 | <0.05 | | | | (5) 4.7 |
| Trichloroethylene | <0.05 | <0.05 | | | | (5) 1.6 |
| Trichlorofluoromethane | <0.05 | <0.05 | | | | 150 |
| Vinyl Chloride | <0.02 | <0.02 | | | | (1.7) 0.5 |
| Xylenes | <0.05 | <0.05 | | | | 300 |
| ***Surrogate Recovery (%)*** | | | | | | |
| Bromochloromethane | 84 | 100 | | | | 60-140 |
| 1,4-Difluorobenzene | 87 | 103 | | | | 60-140 |
| 1,4-Dichlorobutane | 93 | 106 | | | | 60-140 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 2**: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition.

All Types of Property Use. ( ) Standard value in brackets applies to medium and fine textured soils.



*Results related only to the items tested*

***Client:*** Rocco Forgione ***F.E. Job #:*** 20-4070

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (ug/L) | | Recovery (%) | | Recovery (%) | |
| ***VOCs in Water*** | | | | | | |
| Acetone | <0.5 | 0.5 | 114 | 50-140 | 62 | 50-140 |
| Benzene | <0.02 | 0.02 | 87 | 60-130 | 91 | 50-140 |
| Bromodichloromethane | <0.05 | 0.05 | 109 | 50-140 | 92 | 50-140 |
| Bromoform | <0.05 | 0.05 | 97 | 60-130 | 95 | 50-140 |
| Bromomethane | <0.05 | 0.05 | 123 | 50-140 | 64 | 50-140 |
| Carbon Tetrachloride | <0.05 | 0.05 | 84 | 60-130 | 98 | 50-140 |
| Chlorobenzene | <0.05 | 0.05 | 92 | 60-130 | 92 | 50-140 |
| Chloroform | <0.05 | 0.05 | 100 | 60-130 | 87 | 50-140 |
| Dibromochloromethane | <0.05 | 0.05 | 106 | 60-130 | 114 | 50-140 |
| 1,2-Dichlorobenzene | <0.05 | 0.05 | 107 | 60-130 | 95 | 50-140 |
| 1,3-Dichlorobenzene | <0.05 | 0.05 | 95 | 60-130 | 96 | 50-140 |
| 1,4-Dichlorobenzene | <0.05 | 0.05 | 103 | 60-130 | 118 | 50-140 |
| Dichlordifluoromethane | <0.05 | 0.05 | 84 | 50-140 | 98 | 50-140 |
| 1,1-Dichloroethane | <0.05 | 0.05 | 91 | 60-130 | 108 | 50-140 |
| 1,2-Dichloroethane | <0.05 | 0.05 | 106 | 60-130 | 105 | 50-140 |
| 1,1-Dichloroethylene | <0.05 | 0.05 | 105 | 60-130 | 117 | 50-140 |
| c-1,2-Dichloroethylene | <0.05 | 0.05 | 108 | 60-130 | 115 | 50-140 |
| t-1,2-Dichloroethylene | <0.05 | 0.05 | 117 | 60-130 | 107 | 50-140 |
| 1,2-Dichloropropane | <0.05 | 0.05 | 115 | 60-130 | 69 | 50-140 |
| 1,3-Dichloropropene (cis-+trans-) | <0.05 | 0.05 | 93 | 60-130 | 81 | 50-140 |
| Ethylbenzene | <0.05 | 0.05 | 92 | 60-130 | 94 | 50-140 |
| Ethylene Dibromide | <0.05 | 0.05 | 88 | 60-130 | 114 | 50-140 |
| Hexane (n) | <0.05 | 0.05 | 78 | 60-130 | 103 | 50-140 |
| Methyl Ethyl Ketone | <0.5 | 0.5 | 79 | 50-140 | 93 | 50-140 |
| Methyl Isobutyl Ketone | <0.5 | 0.5 | 107 | 50-140 | 87 | 50-140 |
| Methyl tert-butyl Ether | <0.05 | 0.05 | 76 | 60-130 | 116 | 50-140 |
| Methylene Chloride | <0.05 | 0.05 | 88 | 60-130 | 88 | 50-140 |
| Styrene | <0.05 | 0.05 | 84 | 60-130 | 109 | 50-140 |
| 1,1,1,2-Tetrachloroethane | <0.05 | 0.05 | 78 | 60-130 | 112 | 50-140 |
| 1,1,2,2-Tetrachloroethane | <0.05 | 0.05 | 72 | 60-130 | 66 | 50-140 |
| Tetrachloroethylene | <0.05 | 0.05 | 91 | 60-130 | 92 | 50-140 |
| Toluene | <0.2 | 0.2 | 106 | 60-130 | 98 | 50-140 |
| 1,1,1-Trichloroethane | <0.05 | 0.05 | 88 | 60-130 | 87 | 50-140 |
| 1,1,2-Trichloroethane | <0.05 | 0.05 | 79 | 60-130 | 82 | 50-140 |
| Trichloroethylene | <0.05 | 0.05 | 93 | 60-130 | 98 | 50-140 |
| Trichlorofluoromethane | <0.05 | 0.05 | 74 | 50-140 | 68 | 50-140 |
| Vinyl Chloride | <0.02 | 0.02 | 71 | 50-140 | 81 | 50-140 |
| Xylenes | <0.05 | 0.05 | 80 | 60-130 | 110 | 50-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| Bromocholoromethane | 108 | 60-140 | 76 | 60-140 | 77 | 60-140 |
| 1,4-Difluorobenzene | 97 | 60-140 | 71 | 60-140 | 84 | 60-140 |
| 1,4-Dichlorobutane | 112 | 60-140 | 86 | 60-140 | 88 | 60-140 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range



*Results related only to the items tested*

***Client:*** Rocco Forgione ***F.E. Job #:*** 20-4070

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***VOCs in Water*** | | | | | | |
| Acetone | 0.0 | 0-30 | | | | |
| Benzene | 0.0 | 0-30 | | | | |
| Bromodichloromethane | 0.0 | 0-30 | | | | |
| Bromoform | 0.0 | 0-30 | | | | |
| Bromomethane | 0.0 | 0-30 | | | | |
| Carbon Tetrachloride | 0.0 | 0-30 | | | | |
| Chlorobenzene | 0.0 | 0-30 | | | | |
| Chloroform | 0.0 | 0-30 | | | | |
| Dibromochloromethane | 0.0 | 0-30 | | | | |
| 1,2-Dichlorobenzene | 0.0 | 0-30 | | | | |
| 1,3-Dichlorobenzene | 0.0 | 0-30 | | | | |
| 1,4-Dichlorobenzene | 0.0 | 0-30 | | | | |
| Dichlordifluoromethane | 0.0 | 0-30 | | | | |
| 1,1-Dichloroethane | 0.0 | 0-30 | | | | |
| 1,2-Dichloroethane | 0.0 | 0-30 | | | | |
| 1,1-Dichloroethylene | 0.0 | 0-30 | | | | |
| c-1,2-Dichloroethylene | 0.0 | 0-30 | | | | |
| t-1,2-Dichloroethylene | 0.0 | 0-30 | | | | |
| 1,2-Dichloropropane | 0.0 | 0-30 | | | | |
| 1,3-Dichloropropene (cis-+trans-) | 0.0 | 0-30 | | | | |
| Ethylbenzene | 0.0 | 0-30 | | | | |
| Ethylene Dibromide | 0.0 | 0-30 | | | | |
| Hexane (n) | 0.0 | 0-30 | | | | |
| Methyl Ethyl Ketone | 0.0 | 0-30 | | | | |
| Methyl Isobutyl Ketone | 0.0 | 0-30 | | | | |
| Methyl tert-butyl Ether | 0.0 | 0-30 | | | | |
| Methylene Chloride | 0.0 | 0-30 | | | | |
| Styrene | 0.0 | 0-30 | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0 | 0-30 | | | | |
| 1,1,2,2-Tetrachloroethane | 0.0 | 0-30 | | | | |
| Tetrachloroethylene | 1.0 | 0-30 | | | | |
| Toluene | 0.0 | 0-30 | | | | |
| 1,1,1-Trichloroethane | 0.0 | 0-30 | | | | |
| 1,1,2-Trichloroethane | 0.0 | 0-30 | | | | |
| Trichloroethylene | 0.0 | 0-30 | | | | |
| Trichlorofluoromethane | 0.0 | 0-30 | | | | |
| Vinyl Chloride | 0.0 | 0-30 | | | | |
| Xylenes | 0.0 | 0-30 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| Bromocholoromethane | 68 | 60-140 | | | | |
| 1,4-Difluorobenzene | 65 | 60-140 | | | | |
| 1,4-Dichlorobutane | 81 | 60-140 | | | | |

***LEGEND:***

AR - Acceptable Range

RPD - Relative Percent Difference



*Results related only to the items tested*

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***Client:*** Rocco Forgione
***Address:***

***Tel:*** 416-736-4900
***Email:***
***Attn.:***

***F.E. Job #:*** 20-4114
***Project Name:*** Phase Two ESA - 86 Thomas Street
***Project ID:*** FE-P 20-10069
***Date Sampled:*** 19-Feb-2020
***Date Received:*** 20-Feb-2020
***Date Reported:*** 27-Feb-2020
***Location:*** 86 Thomas Street
Mississauga, ON

# Certificate of Analysis

| Analyses | Matrix | Quantity | Date Extracted | Date Analyzed | Lab SOP | Method Reference |
|---|---|---|---|---|---|---|
| Metals | Water | 4 | N/A | 27-Feb-20 | Metals F-1 | SM 3120-B |
| VOCs | Water | 2 | N/A | 21-Feb-20 | VOCs F-6 | SM 6200-B |
| PHCs (F1 & BTEX) | Water | 4 | N/A | 21-Feb-20 | PHCs F-7 | CCME CWS |
| PHCs (F2 - F4) | Water | 4 | 21-Feb-20 | 24-Feb-20 | PHCs F-7 | CCME CWS |
| PCBs | Water | 1 | 24-Feb-20 | 24-Feb-20 | PCBs F-5 | SM 6630C |

Fisher Environmental Laboratories is accredited by CALA (the Canadian Association for Laboratory Accreditation Inc.) for specific parameters as required by Ontario Regulation 153/04. All analytical testing has been performed in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act published by Ontario Ministry of the Environment.

***Authorized by:*** _____

*Roger Lin, Ph. D., C. Chem.*
*Laboratory Manager*




*Results related only to the items tested*

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs |
| ***Sample Description:*** | 4 Water Samples |

| **Parameter** | ***20-4114-1*** MW1 | ***20-4114-2*** MW2 | ***20-4114-3*** MW3 | ***20-4114-4*** MW3 Duplicate | | **Ground Water Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration ( µg/L)* | | | | | |
| ***Metals in Water*** | | | | | | |
| Antimony | 0.9 | <0.5 | <0.5 | <0.5 | | 20,000 |
| Arsenic | <1 | 5.7 | 4.2 | <1 | | 1,900 |
| Barium | 35 | 48 | 28 | 27 | | 29,000 |
| Beryllium | <0.5 | 0.9 | 1.2 | 1.1 | | 67 |
| Boron | 1592 | 2367 | 2870 | 2477 | | 45,000 |
| Cadmium | <0.5 | 1.7 | 1.5 | 1.9 | | 2.7 |
| Chromium | <10 | 12 | 11 | 10 | | 810 |
| Cobalt | 1.7 | 2.3 | 3.0 | 3.2 | | 66 |
| Copper | 9.6 | 10 | 13 | 12 | | 87 |
| Lead | <1 | <1 | <1 | <1 | | 25 |
| Molybdenum | 35 | 6.1 | 5.6 | 6.4 | | 9,200 |
| Nickel | 9.1 | 15 | 17 | 19 | | 490 |
| Selenium | <5 | <5 | <5 | <5 | | 63 |
| Silver | <0.3 | <0.3 | <0.3 | <0.3 | | 1.5 |
| Thallium | <0.5 | <0.5 | <0.5 | <0.5 | | 510 |
| Uranium | 9.0 | 11 | 7.8 | 10 | | 420 |
| Vanadium | <0.5 | <0.5 | <0.5 | <0.5 | | 250 |
| Zinc | 10 | 13 | 5.3 | 8.0 | | 1,100 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 3**: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

All Types of Property Use.

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (µg/L) | | Recovery (%) | | Recovery (%) | |
| ***Metals in Water*** | | | | | | |
| Antimony | <0.5 | 0.5 | 96 | 80-120 | 116 | 70-130 |
| Arsenic | <1 | 1 | 101 | 80-120 | 130 | 70-130 |
| Barium | <2 | 2 | 112 | 80-120 | 91 | 70-130 |
| Beryllium | <0.5 | 0.5 | 100 | 80-120 | 128 | 70-130 |
| Boron | <10 | 10 | 90 | 80-120 | 89 | 70-130 |
| Cadmium | <0.5 | 0.5 | 96 | 80-120 | 118 | 70-130 |
| Chromium | <10 | 10 | 101 | 80-120 | 110 | 70-130 |
| Cobalt | <1 | 1 | 112 | 80-120 | 103 | 70-130 |
| Copper | <5 | 5 | 87 | 80-120 | 101 | 70-130 |
| Lead | <1 | 1 | 92 | 80-120 | 128 | 70-130 |
| Molybdenum | <0.5 | 0.5 | 102 | 80-120 | 124 | 70-130 |
| Nickel | <1 | 1 | 100 | 80-120 | 102 | 70-130 |
| Selenium | <5 | 5 | 97 | 80-120 | 79 | 70-130 |
| Silver | <0.3 | 0.3 | 101 | 80-120 | 77 | 70-130 |
| Thallium | <0.5 | 0.5 | 98 | 80-120 | 116 | 70-130 |
| Uranium | <2 | 2 | 91 | 80-120 | 111 | 70-130 |
| Vanadium | <0.5 | 0.5 | 95 | 80-120 | 116 | 70-130 |
| Zinc | <5 | 5 | 103 | 80-120 | 98 | 70-130 |

***LEGEND:***
RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***Metals in Water*** | | | | | | |
| Antimony | 0.0 | 0-20 | | | | |
| Arsenic | 0.0 | 0-20 | | | | |
| Barium | 1.4 | 0-20 | | | | |
| Beryllium | 0.0 | 0-20 | | | | |
| Boron | 5.5 | 0-20 | | | | |
| Cadmium | 0.0 | 0-20 | | | | |
| Chromium | 8.1 | 0-20 | | | | |
| Cobalt | 3.6 | 0-20 | | | | |
| Copper | 5.7 | 0-20 | | | | |
| Lead | 0.0 | 0-20 | | | | |
| Molybdenum | 0.7 | 0-20 | | | | |
| Nickel | 5.3 | 0-20 | | | | |
| Selenium | 0.0 | 0-20 | | | | |
| Silver | 0.0 | 0-20 | | | | |
| Thallium | 0.0 | 0-20 | | | | |
| Uranium | 8.6 | 0-20 | | | | |
| Vanadium | 0.0 | 0-20 | | | | |
| Zinc | 17 | 0-20 | | | | |

***LEGEND:***
AR - Acceptable Range
RPD - Relative Percent Difference

***Client:*** Rocco Forgione ***F.E. Job #:*** 20-4114

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs |
| ***Sample Description:*** | 4 Water Samples |

| **Parameter** | ***20-4114-1*** MW1 | ***20-4114-3*** MW3 | | | | **Ground Water Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration ( µ g/L)* | | | | | |
| ***VOCs in Water*** | | | | | | |
| Acetone | <30 | <30 | | | | 130000 |
| Benzene | <0.5 | <0.5 | | | | (430) 44 |
| Bromodichloromethane | <2 | <2 | | | | 85000 |
| Bromoform | <5 | <5 | | | | (770) 380 |
| Bromomethane | <0.5 | <0.5 | | | | (56) 5.6 |
| Carbon Tetrachloride | <0.2 | <0.2 | | | | (8.4) 0.79 |
| Chlorobenzene | <0.5 | <0.5 | | | | 630 |
| Chloroform | <1 | <1 | | | | (22) 2.4 |
| Dibromochloromethane | <2 | <2 | | | | 82000 |
| 1,2-Dichlorobenzene | <0.5 | <0.5 | | | | (9600) 4600 |
| 1,3-Dichlorobenzene | <0.5 | <0.5 | | | | 9600 |
| 1,4-Dichlorobenzene | <0.5 | <0.5 | | | | (67) 8 |
| Dichlorodifluoromethane | <2 | <2 | | | | 4400 |
| 1,1-Dichloroethane | <0.5 | <0.5 | | | | (3100) 320 |
| 1,2-Dichloroethane | <0.5 | <0.5 | | | | (12) 1.6 |
| 1,1-Dichloroethylene | <0.5 | <0.5 | | | | (17) 1.6 |
| c-1,2-Dichloroethylene | <0.5 | <0.5 | | | | (17) 1.6 |
| t-1,2-Dichloroethylene | <0.5 | <0.5 | | | | (17) 1.6 |
| 1,2-Dichloropropane | <0.5 | <0.5 | | | | (140) 16 |
| 1,3-Dichloropropene (cis-+trans-) | <0.5 | <0.5 | | | | (45) 5.2 |
| Ethylbenzene | <0.5 | <0.5 | | | | 2300 |
| Ethylene Dibromide | <0.2 | <0.2 | | | | (0.83) 0.25 |
| Hexane (n) | <5 | <5 | | | | (520) 51 |
| Methyl Ethyl Ketone | <20 | <20 | | | | (1500000)470000 |
| Methyl Isobutyl Ketone | <20 | <20 | | | | (580000)140000 |
| Methyl tert-butyl Ether | <2 | <2 | | | | (1400) 190 |
| Methylene Chloride | <5 | <5 | | | | (5500) 610 |
| Styrene | <0.5 | <0.5 | | | | (9100) 1300 |
| 1,1,1,2-Tetrachloroethane | <0.5 | <0.5 | | | | (28) 3.3 |
| 1,1,2,2-Tetrachloroethane | <0.5 | <0.5 | | | | (15) 3.2 |
| Tetrachloroethylene | <0.5 | <0.5 | | | | (17) 1.6 |
| Toluene | <0.5 | <0.5 | | | | 18000 |
| 1,1,1-Trichloroethane | <0.5 | <0.5 | | | | (6700) 640 |
| 1,1,2-Trichloroethane | <0.5 | <0.5 | | | | (30) 4.7 |
| Trichloroethylene | <0.5 | <0.5 | | | | (17) 1.6 |
| Trichlorofluoromethane | <5 | <5 | | | | 2500 |
| Vinyl Chloride | <0.5 | <0.5 | | | | (1.7) 0.5 |
| Xylenes | <0.5 | <0.5 | | | | 4200 |
| ***Surrogate Recovery (%)*** | | | | | | |
| Bromochloromethane | 106 | 97 | | | | 60-140 |
| 1,4-Difluorobenzene | 105 | 92 | | | | 60-140 |
| 1,4-Dichlorobutane | 109 | 99 | | | | 60-140 |

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 3**: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

All Types of Property Use. ( ) Standard value in brackets applies to medium and fine textured soils.

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (ug/L) | | Recovery (%) | | Recovery (%) | |
| ***VOCs in Water*** | | | | | | |
| Acetone | <30 | 30 | 68 | 50-140 | 61 | 50-140 |
| Benzene | <0.5 | 0.5 | 83 | 60-130 | 74 | 50-140 |
| Bromodichloromethane | <2 | 2 | 97 | 50-140 | 89 | 50-140 |
| Bromoform | <5 | 5 | 95 | 60-130 | 100 | 50-140 |
| Bromomethane | <0.5 | 0.5 | 123 | 50-140 | 64 | 50-140 |
| Carbon Tetrachloride | <0.2 | 0.2 | 84 | 60-130 | 98 | 50-140 |
| Chlorobenzene | <0.5 | 0.5 | 92 | 60-130 | 92 | 50-140 |
| Chloroform | <1 | 1 | 93 | 60-130 | 88 | 50-140 |
| Dibromochloromethane | <2 | 2 | 106 | 60-130 | 114 | 50-140 |
| 1,2-Dichlorobenzene | <0.5 | 0.5 | 107 | 60-130 | 95 | 50-140 |
| 1,3-Dichlorobenzene | <0.5 | 0.5 | 95 | 60-130 | 96 | 50-140 |
| 1,4-Dichlorobenzene | <0.5 | 0.5 | 103 | 60-130 | 118 | 50-140 |
| Dichlorodifluoromethane | <2 | 2 | 90 | 50-140 | 65 | 50-140 |
| 1,1-Dichloroethane | <0.5 | 0.5 | 91 | 60-130 | 108 | 50-140 |
| 1,2-Dichloroethane | <0.5 | 0.5 | 96 | 60-130 | 74 | 50-140 |
| 1,1-Dichloroethylene | <0.5 | 0.5 | 105 | 60-130 | 117 | 50-140 |
| c-1,2-Dichloroethylene | <0.5 | 0.5 | 102 | 60-130 | 75 | 50-140 |
| t-1,2-Dichloroethylene | <0.5 | 0.5 | 104 | 60-130 | 90 | 50-140 |
| 1,2-Dichloropropane | <0.5 | 0.5 | 115 | 60-130 | 69 | 50-140 |
| 1,3-Dichloropropene (cis-+trans-) | <0.5 | 0.5 | 93 | 60-130 | 81 | 50-140 |
| Ethylbenzene | <0.5 | 0.5 | 88 | 60-130 | 70 | 50-140 |
| Ethylene Dibromide | <0.2 | 0.2 | 95 | 60-130 | 81 | 50-140 |
| Hexane (n) | <5 | 5 | 105 | 60-130 | 114 | 50-140 |
| Methyl Ethyl Ketone | <20 | 20 | 79 | 50-140 | 93 | 50-140 |
| Methyl Isobutyl Ketone | <20 | 20 | 117 | 50-140 | 92 | 50-140 |
| Methyl tert-butyl Ether | <2 | 2 | 76 | 60-130 | 116 | 50-140 |
| Methylene Chloride | <5 | 5 | 85 | 60-130 | 77 | 50-140 |
| Styrene | <0.5 | 0.5 | 81 | 60-130 | 69 | 50-140 |
| 1,1,1,2-Tetrachloroethane | <0.5 | 0.5 | 78 | 60-130 | 112 | 50-140 |
| 1,1,2,2-Tetrachloroethane | <0.5 | 0.5 | 72 | 60-130 | 66 | 50-140 |
| Tetrachloroethylene | <0.5 | 0.5 | 87 | 60-130 | 72 | 50-140 |
| Toluene | <0.5 | 0.5 | 97 | 60-130 | 84 | 50-140 |
| 1,1,1-Trichloroethane | <0.5 | 0.5 | 89 | 60-130 | 71 | 50-140 |
| 1,1,2-Trichloroethane | <0.5 | 0.5 | 79 | 60-130 | 82 | 50-140 |
| Trichloroethylene | <0.5 | 0.5 | 91 | 60-130 | 76 | 50-140 |
| Trichlorofluoromethane | <5 | 5 | 74 | 50-140 | 68 | 50-140 |
| Vinyl Chloride | <0.5 | 0.5 | 71 | 50-140 | 81 | 50-140 |
| Xylenes | <0.5 | 0.5 | 89 | 60-130 | 86 | 50-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| Bromocholoromethane | 111 | 60-140 | 80 | 60-140 | 99 | 60-140 |
| 1,4-Difluorobenzene | 103 | 60-140 | 77 | 60-140 | 97 | 60-140 |
| 1,4-Dichlorobutane | 109 | 60-140 | 71 | 60-140 | 93 | 60-140 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***VOCs in Water*** | | | | | | |
| Acetone | 0.0 | 0-30 | | | | |
| Benzene | 1.0 | 0-30 | | | | |
| Bromodichloromethane | 0.0 | 0-30 | | | | |
| Bromoform | 0.0 | 0-30 | | | | |
| Bromomethane | 0.0 | 0-30 | | | | |
| Carbon Tetrachloride | 0.0 | 0-30 | | | | |
| Chlorobenzene | 0.0 | 0-30 | | | | |
| Chloroform | 0.0 | 0-30 | | | | |
| Dibromochloromethane | 0.0 | 0-30 | | | | |
| 1,2-Dichlorobenzene | 0.0 | 0-30 | | | | |
| 1,3-Dichlorobenzene | 0.0 | 0-30 | | | | |
| 1,4-Dichlorobenzene | 0.0 | 0-30 | | | | |
| Dichlorodifluoromethane | 0.0 | 0-30 | | | | |
| 1,1-Dichloroethane | 0.0 | 0-30 | | | | |
| 1,2-Dichloroethane | 0.0 | 0-30 | | | | |
| 1,1-Dichloroethylene | 0.0 | 0-30 | | | | |
| c-1,2-Dichloroethylene | 0.0 | 0-30 | | | | |
| t-1,2-Dichloroethylene | 0.0 | 0-30 | | | | |
| 1,2-Dichloropropane | 0.0 | 0-30 | | | | |
| 1,3-Dichloropropene (cis-+trans-) | 0.0 | 0-30 | | | | |
| Ethylbenzene | 4.0 | 0-30 | | | | |
| Ethylene Dibromide | 0.0 | 0-30 | | | | |
| Hexane (n) | 0.0 | 0-30 | | | | |
| Methyl Ethyl Ketone | 0.0 | 0-30 | | | | |
| Methyl Isobutyl Ketone | 0.0 | 0-30 | | | | |
| Methyl tert-butyl Ether | 0.0 | 0-30 | | | | |
| Methylene Chloride | 0.0 | 0-30 | | | | |
| Styrene | 0.0 | 0-30 | | | | |
| 1,1,1,2-Tetrachloroethane | 0.0 | 0-30 | | | | |
| 1,1,2,2-Tetrachloroethane | 0.0 | 0-30 | | | | |
| Tetrachloroethylene | 0.0 | 0-30 | | | | |
| Toluene | 14 | 0-30 | | | | |
| 1,1,1-Trichloroethane | 0.0 | 0-30 | | | | |
| 1,1,2-Trichloroethane | 0.0 | 0-30 | | | | |
| Trichloroethylene | 0.0 | 0-30 | | | | |
| Trichlorofluoromethane | 0.0 | 0-30 | | | | |
| Vinyl Chloride | 0.0 | 0-30 | | | | |
| Xylenes | 6.0 | 0-30 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| Bromocholoromethane | 87 | 60-140 | | | | |
| 1,4-Difluorobenzene | 88 | 60-140 | | | | |
| 1,4-Dichlorobutane | 91 | 60-140 | | | | |

***LEGEND:***

AR - Acceptable Range

RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs |
| ***Sample Description:*** | 4 Water Samples |

| **Parameter** | ***20-4114-1*** MW1 | ***20-4114-2*** MW2 | ***20-4114-3*** MW3 | ***20-4114-4*** MW3 Duplicate | | **Ground Water Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration ( µ g/L)* | | | | | |
| ***BTEX in Water*** | | | | | | |
| Benzene | <0.5 | <0.5 | <0.5 | <0.5 | | (430) 44 |
| Toluene | <0.5 | <0.5 | <0.5 | <0.5 | | 18000 |
| Ethylbenzene | <0.5 | <0.5 | <0.5 | <0.5 | | 2300 |
| Xylenes | <0.5 | <0.5 | <0.5 | <0.5 | | 4200 |
| ***PHCs (F1-F4) in Water*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | <25 | <25 | <25 | <25 | | 750 |
| F2 ($C_{10}$ - $C_{16}$) | <100 | <100 | <100 | <100 | | 150 |
| F3 ($C_{16}$ - $C_{34}$) | <100 | <100 | <100 | <100 | | 500 |
| F4 (>$C_{34}$) | <100 | <100 | <100 | <100 | | 500 |
| Chromatogram descends to baseline by nC50 ? (Yes/No) | Yes | Yes | Yes | Yes | | |
| ***Surrogate Recovery (%)*** | | | | | | |
| Bromochloromethane | 106 | 89 | 97 | 78 | | 60-140 |
| 1,4-Difluorobenzene | 105 | 91 | 92 | 77 | | 60-140 |
| 1,4-Dichlorobutane | 109 | 80 | 99 | 83 | | 60-140 |

$F_{4G}$ (gravimetric heavy hydrocarbons) cannot be added to the $C_6$ to $C_{50}$ hydrocarbons.

< result obtained was below RL (Reporting Limit).

[1] MOE - Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, April 15, 2011.

**Table 3**: Full Depth Generic Site Condition Standards in a Non-Potable Ground Water Condition.

All Types of Property Use. ( ) Standard value in brackets applies to medium and fine textured soils.

# QA/QC Report

| Parameter | Blank | RL | LCS | AR | MS | AR |
|---|---|---|---|---|---|---|
| | (ug/L) | | Recovery (%) | | Recovery (%) | |
| ***BTEX in Water*** | | | | | | |
| Benzene | <0.5 | 0.5 | 82 | 60-130 | 75 | 50-140 |
| Toluene | <0.5 | 0.5 | 101 | 60-130 | 74 | 50-140 |
| Ethylbenzene | <0.5 | 0.5 | 95 | 60-130 | 82 | 50-140 |
| Xylenes | <0.5 | 0.5 | 105 | 60-130 | 89 | 50-140 |
| ***PHC (F1-F4) in Water*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | <25 | 25 | 100 | 60-140 | 100 | 60-140 |
| F2 ($C_{10}$ - $C_{16}$) | <10 | 10 | 96 | 80-120 | 139 | 60-140 |
| F3 ($C_{16}$ - $C_{34}$) | <50 | 50 | 93 | 80-120 | 116 | 60-140 |
| F4 (>$C_{34}$) | <50 | 50 | 97 | 80-120 | 89 | 60-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| Bromochloromethane | 111 | 60-140 | 80 | 60-140 | 99 | 60-140 |
| 1,4-Difluorobenzene | 103 | 60-140 | 77 | 60-140 | 97 | 60-140 |
| 1,4-Dichlorobutane | 109 | 60-140 | 71 | 60-140 | 93 | 60-140 |

***LEGEND:***

RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range

# QA/QC Report

| Parameter | Duplicate | AR | | | | |
|---|---|---|---|---|---|---|
| | RPD (%) | | | | | |
| ***BTEX in Water*** | | | | | | |
| Benzene | 12 | 0-30 | | | | |
| Toluene | 9.0 | 0-30 | | | | |
| Ethylbenzene | 4.0 | 0-30 | | | | |
| Xylenes | 6.0 | 0-30 | | | | |
| ***PHC (F1-F4) in Water*** | | | | | | |
| $F1_{-BTEX}$ ($C_6$ - $C_{10}$) | 0.0 | 0-30 | | | | |
| F2 ($C_{10}$ - $C_{16}$) | 0.0 | 0-30 | | | | |
| F3 ($C_{16}$ - $C_{34}$) | 21 | 0-30 | | | | |
| F4 (>$C_{34}$) | 8.0 | 0-30 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| Bromochloromethane | 79 | 60-140 | | | | |
| 1,4-Difluorobenzene | 83 | 60-140 | | | | |
| 1,4-Dichlorobutane | 82 | 60-140 | | | | |

***LEGEND:***
AR - Acceptable Range
RPD - Relative Percent Difference

# Certificate of Analysis

| | |
|---|---|
| ***Analysis Requested:*** | Metals, VOCs, PHCs, PCBs |
| ***Sample Description:*** | 4 Water Samples |

| **Parameter** | ***20-4114-1*** MW1 | | | | | **Ground Water Standards [1]** |
|---|---|---|---|---|---|---|
| | *Concentration (µg/L)* | | | | | |
| ***PCBs in Water*** | <0.02 | | | | | (15) 7.8 |
| ***Surrogate Recovery (%)*** | | | | | | |
| Decachlorobiphenyl | 107 | | | | | 60-140 |

# QA/QC Report

| **Parameter** | **Blank** | **RL** | **LCS** | **AR** | **MS** | **AR** |
|---|---|---|---|---|---|---|
| | **(µg/L)** | | **Recovery (%)** | | **Recovery (%)** | |
| ***PCBs in Water*** | <0.02 | 0.02 | 84 | 60-140 | 97 | 60-140 |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** | **Recovery (%)** | **AR** |
| Decachlorobiphenyl | 94 | 60-140 | 104 | 60-140 | 108 | 60-140 |

| **Parameter** | **Duplicate** | **AR** | | | | |
|---|---|---|---|---|---|---|
| | **RPD (%)** | | | | | |
| ***PCBs in Water*** | 0.0 | 0-40 | | | | |
| ***Surrogates*** | | | | | | |
| **Parameter** | **Recovery (%)** | **AR** | | | | |
| Decachlorobiphenyl | 90 | 60-140 | | | | |

***LEGEND:***
RL - Reporting Limit
LCS - Laboratory Control Sample
MS - Matrix Spike
AR - Acceptable Range
RPD - Relative Percent Difference