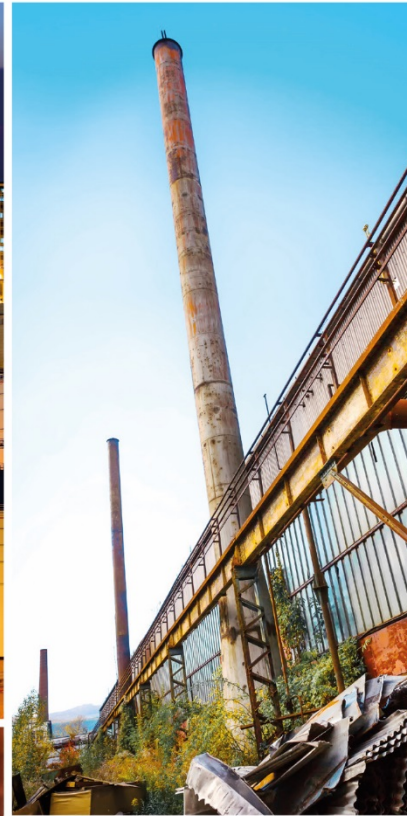
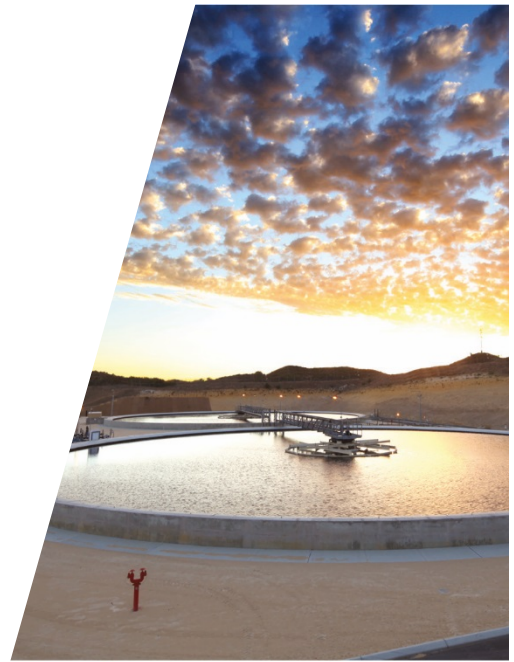




# Phase Two Environmental Site Assessment

Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario

660 Belmont GP Inc.





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## 1. Executive Summary

GHD Limited (GHD) was retained by 660 Belmont GP Inc. to conduct a Phase Two Environmental Site Assessment (ESA) of the commercial property located on the western parcel of 660 Belmont Avenue West in Kitchener, Ontario (hereinafter referred to as the Site or Property). The Site is currently owned by 660 Belmont GP Inc., in its capacity as general partner for and on behalf of 660 Belmont LP. The Site is currently occupied by Dettmer Tirecraft Auto Centre.

It is GHD's understanding that 660 Belmont GP Inc. is planning to redevelop the Property for mixed commercial and residential purposes. The Phase Two ESA was completed to support the filing of a Record of Site Condition (RSC) in accordance with Ontario Regulation 153/04, as amended (O. Reg. 153/04) for change in land use from commercial to mixed commercial and residential.

The Site is located in an area of the City of Kitchener, Ontario that has been developed for mixed industrial, commercial and residential purposes since approximately the late 1940s. The Site is approximately 0.25 hectares (0.6 acres) in size and contains a single-storey commercial building that was constructed in 1961. Based on discussions with the Site representative and review of historical records, the Site building has been utilized for automotive repair and maintenance operations since the Site was developed for commercial purposes in 1961.

### *Phase One ESA*

GHD completed a Phase One ESA of the Site in May 2019. The purpose of the Phase One ESA was to identify, through a non-intrusive investigation, the existence of any Potentially Contaminating Activities (PCAs) and Areas of Potential Environmental Concern (APECs) associated with the Site. The Phase One ESA was completed in accordance with O. Reg. 153/04, which defines PCAs and APECs. The Phase One ESA identified the following APECs to be associated with the Site:

- **APEC #1 – Current and Historical Gasoline Service Stations (off-Site):** Based on the review of historical records, the property immediately to the south of the Site at 638 Belmont Avenue West was historically operated as a gasoline service station. Furthermore, at the time of the Site inspection GHD observed a gasoline service station located approximately 30 metres (m) southwest of the Site at 200 Glasgow Street. The historical and current operation of gasoline service stations with fuel tanks at 638 Belmont Avenue West and 200 Glasgow Street were identified as PCAs (#28 – Gasoline and Associated Products Storage in Fixed Tanks) in accordance with O. Reg. 153/04. Due to the close proximities of these properties to the Site, these PCAs were identified as having the potential to contribute to an APEC at the Site. As such, the southern portion of the Property was identified as **APEC #1**.
- **APEC #2 – Site Operations:** Based on discussions with the Site representative and review of historical records, the Site has been utilized as an automotive repair and maintenance facility since the early 1960s. The operation of an automotive repair and maintenance facility at the Site was identified as a PCA (#27 – Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles) in accordance with O. Reg. 153/04. As such, the area of the maintenance shop on the east-central portion of the western parcel was identified as **APEC #2**.



- **APEC #3 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, two 750-litre (200-gallon) used oil aboveground storage tanks (ASTs) and one 1,000-litre tote containing used coolant/antifreeze were located in the north-central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the used oil tanks and used coolant/antifreeze tote in the north-central portion of the building was identified as **APEC #3**.
- **APEC #4 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, one 1,135-litre engine oil AST and two 550-litre totes containing motor oil in the central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the engine oil AST and motor oil totes in the central portion of the building was identified as **APEC #4**.

### *Purpose of Phase Two ESA*

The purpose of the Phase Two ESA was to investigate the above-noted APECs in accordance with O. Reg. 153/04.

### *Scope of Work*

GHD completed a soil and groundwater investigation at the Site as part of the Phase Two ESA. Soil and groundwater samples were collected and analyzed for specific parameters, which included metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbon (PHC) fractions F1 to F4, volatile organic compounds (VOCs), and pH (for soil samples).

### *Contaminants of Concern (COCs) in Soil*

No COCs were identified in soil since all soil samples submitted for laboratory analysis met the applicable Ministry of the Environment, Conservation and Parks (MECP) Table 2 Standards<sup>1</sup> for metals, PAHs, PHCs, VOCs and pH at all investigative locations.

### *COCs in Groundwater*

All groundwater samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs and VOCs at all investigative locations, with the exception of sodium at three monitoring well locations.

Sodium detected in groundwater at the Property is interpreted to be associated with the application of road salt to the exterior surfaces of the Site and on the adjacent municipal roadways for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. Therefore, in accordance with Section 49.1 of O. Reg. 153/04 that came into effect in December 2019, sodium was not identified as COC at the Property.

Based on the above, no COCs were identified in groundwater.

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<sup>1</sup> "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by MECP, dated April 15, 2011. Table 2 – Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (MECP Table 2 Standards).



## *Conclusion*

Based on the results of the Phase Two ESA, a RSC for change in land use to mixed commercial and residential can be filed with the MECP.

## 2. Introduction

GHD Limited (GHD) was retained by 660 Belmont GP Inc. to conduct a Phase Two ESA for the commercial property located on the western parcel of 660 Belmont Avenue West in Kitchener, Ontario (hereinafter referred to as the Site or Property). The Site is currently owned by 660 Belmont GP Inc., in its capacity as general partner for and on behalf of 660 Belmont LP. The Site is currently occupied by Dettmer Tirecraft Auto Centre. A Site Location Map and a Site Plan are provided on Figure 1 and Figure 2, respectively. Compass directions (north, east, south, and west) described in this report are referenced to "Project North", which is oriented parallel to Belmont Avenue West.

The Phase Two ESA was conducted in general accordance with Ontario Regulation 153/04, as amended (O. Reg. 153/04). It is GHD's understanding that 660 Belmont GP Inc. is planning to redevelop the Property for mixed commercial and residential purposes and that the Phase Two ESA was completed to support the filing of a Record of Site Condition (RSC) for the Site.

GHD completed a Phase One ESA of the Site in May 2019. The results of GHD's Phase One ESA are summarized in the report entitled "Phase One Environmental Site Assessment, Western Parcel of 660 Belmont Avenue West, Kitchener, Ontario", dated April 2020.

The objective of this Phase Two ESA was to investigate soil and groundwater quality in all potential areas of environmental impairment (APECs) identified during the Phase One ESA. This report summarizes the investigative activities completed as part of the Phase Two ESA, and presents the data generated therefrom.

This report has been prepared for the use of 660 Belmont GP Inc. and may not be relied upon by others without the written consent of GHD.

### 2.1 Site Description

The Site is located in an area of the City of Kitchener, Ontario that has been developed for mixed industrial, commercial and residential purposes since approximately the late 1940s. The Site is approximately 0.25 hectares (0.6 acres) in size and contains a single-storey commercial building that was constructed in 1961. Based on discussions with the Site representative and review of historical records, the Site building has been utilized for automotive repair and maintenance operations since the Site was developed for commercial purposes in 1961.



## 2.2 Property Ownership

The Property is owned by 660 Belmont GP Inc., in its capacity as general partner for and on behalf of 660 Belmont LP. The plan of survey for the Property is included in Appendix A. Contact information for the representative of the Property owner is listed below:

Mr. Zac Zehr  
660 Belmont GP Inc.  
607 King Street West, Suite 205A  
Kitchener, Ontario  
N2G 1C7  
(519) 576-2233  
zzehr@zehrgroup.ca

## 2.3 Current and Proposed Future Uses

Based on discussions with the Site representative and review of historical records, the Site building has been utilized for automotive repair and maintenance operations since the Site was developed for commercial purposes in 1961.

It is GHD's understanding that 660 Belmont GP Inc. is planning to redevelop the Property for mixed commercial and residential purposes. The Phase Two ESA was completed to support the filing of a RSC in accordance with O. Reg. 153/04 for change in land use from commercial to mixed commercial and residential.

## 2.4 Applicable Site Condition Standards

The soil and groundwater analytical results were compared to the generic standards provided in the Ministry of the Environment, Conservation and Parks (MECP) document entitled "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011 (hereinafter referred to as the "2011 MECP Standards"). The 2011 MECP Standards provide generic soil and groundwater quality standards for certain chemicals, based on combinations of the following Site-specific conditions:

- **Property Use Type** - As the proposed future land use of the Property will include residential use, the standards for residential/parkland/institutional property use are considered applicable to the Site.
- **Restoration of Groundwater Quality** - The Site obtains its potable water from the Regional Municipality of Waterloo's water distribution system, which obtains its raw water supply from groundwater wells. Based on this, potable groundwater conditions are considered applicable to the Site.
- **Restoration Depth** - For comparative purposes, results were compared to full depth standards.
- **Soil Texture** - The soil analytical results were conservatively compared to the standards for coarse-textured soil.
- **Shallow Soil Property** - A shallow soil property means a property of which 1/3 or more of the area consists of soil equal to or less than 2 metres (m) in depth beneath the soil surface,





excluding any non-soil surface treatment. Greater than 2.0 m of overburden soil exists across the Site. Also, during the Phase Two ESA, shallow groundwater table was encountered at depths ranging from 5.23 to 6.66 metres below ground surface (mBGS). Therefore, the Property is not considered a shallow soil property.

- **Within 30 m of a Water Body** - A water body is not located on the Site and the Site is not located within 30 m of a water body. The closest water body to the Site is Schneider Creek, which is located approximately 485 m south of the Site.

The generic 2011 MECP Standards are not applicable if the Site is considered to be an environmentally sensitive area. The conditions for the above are presented in Section 41 of O. Reg. 153/04. Review of these conditions indicated that the Site is not considered to be environmentally sensitive based on the following:

- The Site is: i) not located within an area of natural significance, ii) does not include or is not adjacent to an area of natural significance, nor is it a part of such area, and iii) does not include land that is within 30 m of an area of natural significance nor is part of such an area. The Ontario Ministry of Natural Resources and Forestry's - "Natural Heritage Information Centre (NHIC)" database was reviewed to identify areas registered as Areas of Natural or Scientific Interest (ANSI) or for known occurrences of Species at Risk (NHIC Rare Occurrences) within a 1-kilometre radius of the Site. No records were identified in the ANSI database to be within 1-kilometre of the Site.
- The soil pH in surface (0 to 1.5 m below ground surface [mBGS]) and subsurface (greater than 1.5 mBGS) soils ranged from 7.79 to 8.21, which is within the acceptable range of 5 and 9 for surface soils, and within acceptable range of 5 and 11 for subsurface soils, as outlined in Section 41 of O. Reg. 153/04.

Based on the above Site-specific information, the applicable standards were determined to be the Table 2: Full Depth Site Condition Standards in a Potable Ground Water Condition (MECP Table 2 Standards). The soil analytical results were assessed with respect to the MECP Table 2 Standards for Residential/Parkland/Institutional Property Use and coarse-textured soil. The groundwater analytical data were assessed with respect to the MECP Table 2 Standards for All Types of Property Use and coarse-textured soil.

## 3. Background Information

### 3.1 Physical Setting

The Site is located in an area of the City of Kitchener, Ontario that has been developed for mixed industrial, commercial and residential purposes since approximately the late 1940s.

The elevation of the Site is approximately 334 metres above mean sea level (mAMSL)<sup>2</sup>. Regional topography slopes steady downward to the east from 370 to 290 mAMSL towards the Grand River.

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<sup>2</sup> Natural Resources Canada [map]. "The Atlas of Canada - Toporama", governed by version 2.3 of the Open Government License – Canada. October 24, 2019. <http://atlas.gc.ca/toporama/en/index.html>



The Site is located in the broad physiographic region known as the Kame Moraines<sup>3</sup>. A review of published quaternary geologic mapping for the area of the Site indicates that the overburden consists predominantly of ice-contact sand<sup>4</sup>. Beneath the overburden deposits is bedrock consisting of sandstone, shale, dolostone and siltstone of the Guelph Formation<sup>5</sup>. The thickness of the overburden deposits varies due to surficial topographic relief, but is on the order of 56 m in the vicinity of the Site when comparing overburden and bedrock topography in the area<sup>6</sup>.

No water bodies are located on the Site. The closest water body to the Site is Schneider Creek, which is located approximately 485 m south of the Site. The Site is not within or adjacent to an "area of natural significance" as defined by O. Reg. 153/04, and there are no areas of natural significance within the Phase One ESA study area.

Currently, residential and commercial land uses surround the Site. The following buildings or features were located on the properties surrounding the Site:

- North:** The Site is bounded to the north by a multi-tenant commercial (retail and offices) building with retail commercial properties located further north of the Site.
- East:** The Site is bounded to the east by the Belmont Lane East with the eastern parcel of 660 Belmont Avenue West and the Iron Horse Trail (a paved recreational trail) located east of the Site. A community park and a residential subdivision is located further east of the Site.
- South:** The Site is bounded to the south by Belmont Lane East with a commercial property occupied by Tim Hortons located further south of the Site.
- West:** The Site is bounded to the west by Belmont Avenue West with retail commercial properties and a residential subdivision located further west of the Site.

### 3.2 Past Investigations

GHD completed a Phase One ESA of the Site in May 2019. The results of GHD's Phase One ESA are summarized in the report entitled "Phase One Environmental Site Assessment, Western Parcel of 660 Belmont Avenue West, Kitchener, Ontario", dated April 2020. The Phase One ESA identified the following APECs to be associated with the Site:

- **APEC #1 – Current and Historical Gasoline Service Stations (off-Site):** Based on the review of historical records, the property immediately to the south of the Site at 638 Belmont Avenue West was historically operated as a gasoline service station. Furthermore, at the time of the Site inspection GHD observed a gasoline service station located approximately 30 m southwest of the Site at 200 Glasgow Street. The historical and current operation of gasoline service stations with fuel tanks at 638 Belmont Avenue West and 200 Glasgow Street were identified as PCAs (#28 – Gasoline and Associated Products Storage in Fixed Tanks) in accordance with

<sup>3</sup> Chapman, L. J., and D. F., Putnam (1984), "The Physiography of Southern Ontario", Ontario Geological Survey.

<sup>4</sup> Karrow, P. F. 1993. Quaternary geology, Stratford area; Ontario Geological Survey, Map 2559, scale 1:50,000

<sup>5</sup> "Bedrock Geology of Ontario" [map]. Scale 1:250,000. OGS Earth Geoscience Data [computer files]. Sudbury, Ontario: Ontario Geological Survey & Ministry of Northern Development and Mines, 2010.

<sup>6</sup> Karrow, P. F. and assistants. 1959. Bedrock topography of the Galt area, southern Ontario; Ontario Department of Mines, Map 2030, Scale 1:63,360.



O. Reg. 153/04. Due to the close proximities of these properties to the Site, these PCAs were identified as having the potential to contribute to an APEC at the Site. As such, the southern portion of the Property was identified as **APEC #1**.

- **APEC #2 – Site Operations:** Based on discussions with the Site representative and review of historical records, the Site has been utilized as an automotive repair and maintenance facility since the early 1960s. The operation of an automotive repair and maintenance facility at the Site was identified as a PCA (#27 – Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles) in accordance with O. Reg. 153/04. As such, the area of the maintenance shop on the east-central portion of the western parcel was identified as **APEC #2**.
- **APEC #3 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, two 750-litre (200-gallon) used oil aboveground storage tanks (ASTs) and one 1,000-litre tote containing used coolant/antifreeze were located in the north-central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the used oil tanks and used coolant/antifreeze tote in the north-central portion of the building was identified as **APEC #3**.
- **APEC #4 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, one 1,135-litre engine oil AST and two 550-litre totes containing motor oil in the central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the engine oil AST and motor oil totes in the central portion of the building was identified as **APEC #4**.

## 4. Scope of the Investigation

### 4.1 Overview of Site Investigation

The objective of the Phase Two ESA was to investigate the APECs identified during the Phase One ESA. The Phase Two ESA Sampling and Analysis Plan (SAP) is provided in Appendix B. The following section provides a summary of the investigative activities that were completed during the Phase Two ESA.

### 4.2 Media Investigated

GHD completed soil and groundwater investigations as part of Phase Two ESA activities. Sediment sampling was not completed as no water bodies or associated sediment are present at the Site. The following field investigation activities were completed to characterize the Site:

- Advancement of seven boreholes
- Instrumentation of five of the boreholes as groundwater monitoring wells
- Field screening of soil and groundwater
- Hydraulic monitoring (groundwater level measurements and free-product measurements)



- Collection and laboratory analysis of six soil samples (including one field duplicate sample), and five groundwater samples (including one field duplicate sample) from the newly installed groundwater monitoring wells

Soil and groundwater samples were submitted for laboratory analysis of one or more of the following: metals, polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbon (PHC) fractions F1 to F4, volatile organic compounds (VOCs), and pH (for soil samples).

A summary of soil and groundwater sampling locations and chemical analysis is provided in Table 1. The investigative locations are shown on Figure 2.

### 4.3 Phase One Conceptual Site Model

The Site is located in an area of the City of Kitchener, Ontario that has been developed for mixed industrial, commercial and residential purposes since approximately the late 1940s. The Site is approximately 0.25 hectares (0.6 acres) in size and contains a single-storey commercial building that was constructed in 1961. Based on discussions with the Site representative and review of historical records, the Site building has been utilized for automotive repair and maintenance operations since the Site was developed for commercial purposes in 1961. No information regarding the use of the Site was available prior to its development in 1961.

The elevation of the Site is approximately 334 mAMSL. Regional topography slopes steady downward to the east from 370 to 290 mAMSL towards the Grand River. No water bodies are located on the Site. The closest water body to the Site is Schneider Creek, which is located approximately 485 m south of the Site. A review of published quaternary geologic mapping for the area of the Site indicates that the overburden consists predominantly of ice-contact sand. Beneath the overburden deposits is bedrock consisting of sandstone, shale, dolostone and siltstone of the Guelph Formation. According to bedrock drift thickness maps, bedrock at the Site is anticipated to be at a depth of approximately 56 mBGS.

There were no areas of natural significance, as defined in O. Reg. 153/04, identified at the Site or within a 1-km radius of the Site.

Based on discussions with the Site representative and review of Site records, underground utilities present beneath the Site include natural gas lines, and storm and sanitary lines. To the best of GHD's knowledge no other underground utilities are present beneath the Property.

The following APECs (shown on Figure 3) associated with the Site were identified by the Phase One ESA records review, interviews, and Site reconnaissance:

APEC	Location of the APEC on Phase One Property	PCA	Location of PCA (on-site or off-site)
APEC #1 – Current and Historical Gasoline Service Stations (off-Site)	- Southern Property boundary	28. Gasoline and Associated Products Storage in Fixed Tanks	Off-Site



APEC	Location of the APEC on Phase One Property	PCA	Location of PCA (on-site or off-site)
APEC #2 – Site Operations	- East-central portion of the Site	27. Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles	On-Site
APEC #3 – Chemical Storage	- North-central portion of the building	8. Chemical Manufacturing, Processing and Bulk Storage	On-Site
APEC #4 – Chemical Storage	- Central portion of the building	8. Chemical Manufacturing, Processing and Bulk Storage	On-Site

Several off-Site PCAs were identified to be associated with properties located within the Phase One ESA study area (as noted on Figure 4). A summary of the off-Site PCAs within the Phase One ESA Study Area is provided below:

Property Address	PCA(s), in accordance with O. Reg. 153/04	PCA(s) contributing to an APEC at the Property (Yes/No)	Rationale
137 Glasgow Street (approximately 60 m southeast of the Site)	#47 – Rubber Manufacturing and Processing	No	No – 137 Glasgow Street is hydraulically cross-gradient of the Site
Approximately 20 m to the east of the Site	#46 – Rail Yards, Tracks and Spurs	No	Straight run tracks with no sidings that would have been used for storage of railway cars or off-loading of materials
638 Belmont Avenue West (10 m south of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes – <b>APEC #1</b> , southern Property boundary	Due to close proximity and location of 638 Belmont Avenue West with respect to the Site (hydraulically up-gradient)
683 Belmont Avenue West (50 m northwest of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	No – 683 Belmont Avenue West is hydraulically cross-gradient of the Site
200 Glasgow Street (30 m southwest of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Yes – <b>APEC #1</b> , southern Property boundary	Due to close proximity and location of 200 Glasgow Street with respect to the Site (hydraulically up-gradient)



Property Address	PCA(s), in accordance with O. Reg. 153/04	PCA(s) contributing to an APEC at the Property (Yes/No)	Rationale
707 Belmont Avenue West (125 m northwest of the Site)	#37 – Operation of Dry Cleaning Equipment (where chemicals are used)	No	No – due to the distance (125 m) and location of 707 Belmont Avenue West with respect to the Site (i.e., hydraulically cross-gradient)
233 Glasgow Street (195 m southwest of the Site)	#54 – Textile Manufacturing and Processing	No	Distance between 233 Glasgow Street and the Site
592 Belmont Avenue West (165 m south of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	Distance between the Site and 592 Belmont Avenue West
115 Union Boulevard (240 m north of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	No	Distance between the Site and 115 Union Boulevard

Based on the results of the Phase One ESA, the contaminants of concern at the Site include metals, PAHs, PHCs, and VOCs.

The Phase One ESA Conceptual Site Model for the Site and the Phase One ESA study area are shown on Figure 3 and Figure 4, respectively.

The only uncertain/absent information identified during the completion of the Phase One ESA was related to the use of the Property prior to 1961; however, it is reasonable to assume that prior to 1961, the private individuals that owned the Property and surrounding lands either utilized the Site for agricultural purposes, or the Site consisted of vacant land. The limited Property use information prior to 1961 is not interpreted to significantly affect the validity of the Phase One Conceptual Site Model.

#### 4.4 Deviations from Sampling and Analysis Plan

The following deviation from the sampling and analysis plan occurred during the Phase Two ESA field activities:

- Following installation, monitoring well MW2-19 was found to be dry. The screen and riser pipe were removed from monitoring well MW2-19 and the borehole was overdrilled to facilitate the installation of a deeper monitoring well (MW6-19) as a replacement for MW2-19.

#### 4.5 Impediments

No impediments or any denials of access were encountered by GHD during the Phase Two ESA.



## 5. Investigation Methods

### 5.1 General

GHD completed the Phase Two ESA field activities between June 27 and September 17, 2019 using a variety of investigation methods and sampling techniques. Investigations completed included the following, as described in detail in the following subsections:

- Completion of public and private utility locates
- Advancement of boreholes
- Installation of groundwater monitoring wells
- Collection of field soil screening measurements and observations
- Collection of soil and groundwater samples
- Field measurements of groundwater quality parameters
- Hydraulic monitoring (groundwater level measurements and measurements for non-aqueous phase liquid [NAPL], if present)
- Quality assurance and quality control (QA/QC) measures
- Elevation Surveying
- Analytical testing
- Residue management

The field investigation activities were completed in accordance with MECP protocols, GHD's standard operating procedures (SOPs), and standard good practice.

Prior to the start of the investigation activities, GHD prepared a Site-specific Health and Safety Plan (HASP). The purpose of the HASP was to provide specific guidelines and established procedures for the protection of personnel performing the Site investigation activities. In addition, GHD also completed the appropriate public utility notifications and retained a private utility locator to assist with on-Site utility clearance.

### 5.2 Drilling and Excavating

Drilling activities were completed between June 2019 and September 2019. Altech Drilling & Investigative Services Ltd. (Altech) and Direct Environmental Drilling Inc. (DEDI), both MECP-licensed well drillers, were retained by GHD to advance a total of seven boreholes to depths ranging from 2.77 to 9.14 mBGS.

Altech used a track-mounted Geoprobe® 7822DT, and Altech and DEDI used a truck-mounted Diedrich D-50 drill rig equipped with hollow stem augers (HSAs) to advance the boreholes. Altech also advanced two interior boreholes (BH3-19 and BH4-19) in areas with low overhead clearance using a Pionjar 120 hand held portable percussive unit and a concrete corer.



At investigative locations completed by a Geoprobe® 7822DT, soil core samples were collected continuously over 1.5-metre (m) (5-foot) intervals using the 50-millimetre (mm) outside diameter Macro-Core® MC5 direct push soil sampling system. The Macro-Core® MC5 soil sampling system uses a disposable plastic liner for containing and storing soil core samples. At investigative locations completed by Diedrich D-50, boreholes were advanced using hollow stem auger drilling methods, and soil core samples were generally collected in 0.61-m (2-foot) intervals to the final depth of investigation using a 51-mm outside diameter stainless steel split-spoon sampler. At investigation locations completed using a Pionjar 120 hand held portable percussive, soil core samples were collected in 0.61-m (2-foot) intervals to the final depth of investigation using a 50-mm outside diameter Macro-Core® MC5 soil sampling system sampler. Non-dedicated equipment was decontaminated with potable water and detergent between each sampling interval.

Prior to use, and between each borehole location, the drilling and sampling equipment was thoroughly cleaned using a hard bristled scrub brush with Alconox® soap and potable water followed by a potable water rinse. A new liner or washed and rinsed split-spoon was used for each sampling interval.

### 5.3 Soil Sampling

All soil samples collected from the boreholes during the Phase Two ESA were collected using the Macro Core® MC5 direct push soil sampling system, or split-spoon samplers. Soils recovered from each borehole were logged using the Unified Soil Classification System (USCS), making special note of any visual or olfactory evidence of potential impacts.

Soil samples were qualitatively and quantitatively screened in the field for the presence of impact. Qualitative screening was based on visual and olfactory observations, while quantitative screening was based on the measurement of undifferentiated volatile organic vapours in the headspace of the soil samples collected. GHD field personnel screened the soil from the boreholes by placing a portion of the soil core in a Ziploc® bag and measuring relative concentrations of undifferentiated volatile organic vapour readings in the headspace inside the bag using a photoionization detector (PID). Field screening measurement methods are described in Section 5.4. The geological conditions and qualitative and quantitative information (including PID measurements) collected at each investigative location are presented on stratigraphic and instrumentations logs provided in Appendix C. The borehole locations are shown on Figure 2.

The soil sample exhibiting the strongest field evidence of impact (i.e., high PID readings and visual and/or olfactory evidence of impact) was submitted for laboratory analyses. Soil samples were collected in laboratory-supplied glass containers which were placed in a cooler containing ice for sample preservation. Undisturbed soil samples for PHC fraction F1 and VOC analyses were placed directly in sample containers containing methanol preservative, provided by the laboratory. All soil samples were collected using the appropriate sampling techniques.

### 5.4 Field Screening Measurements

GHD field personnel screened the soil from the boreholes by placing a portion of the soil core in a Ziploc® bag and measuring relative concentrations of undifferentiated volatile organic vapour readings in the headspace inside the bag using a photoionization detector (PID).





Prior to use, the PID was inspected and calibrated according to the manufacturer's recommendations. Calibrating the MiniRae 2000 is a two point process using "fresh air" and the standard reference gas (also known as span gas). A "fresh air" calibration, which contained no detectable VOC (0.0 parts per million [ppm]), was used to set the zero point for the sensor. Then, a standard reference gas (isobutylene) of known concentration (100 ppm) was used to set the second point of reference.

The PID model specifications are listed below:

<b>Detector:</b>	Photo ionization detector with 10.6 eV UV lamp
<b>Measurement Accuracy (Isobutylene):</b>	0 - 2,000 ppm: $\pm 2$ ppm or 10% of reading >2,000 ppm: $\pm 20\%$ of reading
<b>Calibration:</b>	Two point field calibration of zero and standard reference gas

The PID measurements from field screening the soil samples are presented on the borehole stratigraphic and instrumentation logs provided in Appendix C.

## 5.5 Groundwater: Monitoring Well Installation

Groundwater monitoring wells were installed in five of the seven boreholes that were advanced as part of the Phase Two ESA. The bottom screened depths of the monitoring wells ranged from 6.10 to 9.14 mBGS. A summary of monitoring well completion details is presented in Table 2.

The groundwater monitoring wells were constructed with a 51-mm (2-inch) diameter, Schedule 40 polyvinyl chloride (PVC) riser with a 3.0 m (10 feet) long, No. 10 slot size well screen. The well screens were installed to straddle the groundwater table based on wet/saturated soil conditions encountered during borehole advancement activities. A silica sand pack was placed in the annular space between the PVC screen/riser pipe and the borehole to a height of approximately 0.3 m above the top of the screen. A bentonite seal was placed directly above the sand pack and extended to within 0.3 m of the ground surface. To complete the instrumentation, an expandable J-plug was installed on the riser casing. A protective flush-mount casing with a concrete collar was placed around each of the wells upon completion. Each groundwater monitoring well was equipped with dedicated sampling equipment consisting of Waterra™ tubing and inertial foot valves for monitoring well development.

Following installation, monitoring well MW2-19 was found to be dry. The screen and riser pipe were removed from MW2-19 and the borehole was overdrilled to facilitate the installation of a deeper monitoring well (MW6-19) as a replacement for MW2-19.

The monitoring wells were registered with the MECP in accordance with O. Reg. 903. A summary of monitoring well construction details are provided in Table 2. The locations of the monitoring wells are shown on Figure 2. The stratigraphic and instrumentation logs are provided in Appendix C.



## 5.6 Groundwater: Field Measurements of Water Quality Parameters

In order to ensure that samples representative of on-Site groundwater conditions were obtained, each monitoring well was developed upon completion of installation. GHD implemented the following protocol during well development activities:

- The groundwater monitoring wells were equipped with dedicated Waterra™ tubing and an inertial foot valve for well development activities.
- The groundwater monitoring wells were purged of a minimum of 5 to 10 well volumes to remove the standing groundwater volume in the well.
- Field measurements of temperature, pH, and electrical conductivity were recorded after each purged well volume using a Horiba water quality meter until consistent field measurements were recorded indicating that water in the well was representative of groundwater conditions.

The purged water was temporarily contained in 205-litre drums.

## 5.7 Groundwater: Sampling

Prior to initiating groundwater sampling activities, headspace readings, depth to groundwater measurements, and a NAPL check were completed at each of the monitoring wells.

Subsequent to well development activities, as discussed in Section 5.6, each monitoring well was purged and sampled using low-flow sampling techniques in order to ensure that samples representative of groundwater conditions were obtained. Peristaltic pumps were used to purge and sample each of the monitoring wells. GHD implemented the following protocol during groundwater sample collection:

- The groundwater monitoring wells were equipped with dedicated 0.25-inch polyethylene tubing for well purging and sampling activities.
- Field measurements of pumping rate, depth to water, drawdown from initial water level, pH, temperature, turbidity, electrical conductivity, dissolved oxygen, and oxidation reduction potential were monitored over time until consistent field measurements were recorded, indicating that water in the well was representative of groundwater conditions. The water quality parameters were measured using a Horiba water quality meter equipped with a flow-through cell.
- Purging was continued until field parameters stabilized in order to attain a representative groundwater sample.
- Groundwater samples collected for metals analysis were field filtered using a 0.45 micron filter prior to sample collection.

Groundwater samples were collected in laboratory supplied sample containers specific to the analytical parameters, stored in coolers chilled with ice, and submitted under chain-of-custody protocol for laboratory analysis. All groundwater samples were collected using the appropriate sampling techniques.



## 5.8 Sediment Sampling

Sediment sampling was not completed during the Phase Two ESA as no surface water bodies are located on the Site.

## 5.9 Analytical Testing

All soil and groundwater samples were submitted under chain-of-custody protocol to ALS Laboratory Group (ALS) for chemical analysis. ALS is accredited by the Canadian Association for Laboratory Accreditation (CALA), a MECP-approved accreditation body.

A copy of the analytical laboratory reports is provided in Appendix D.

## 5.10 Residue Management Procedures

Soil cuttings, groundwater purge water, and equipment decontamination wash water generated during drilling activities were contained in 205-litre (45-gallon) metal or plastic drums and stored on-Site, pending characterization and future off-Site disposal in accordance with applicable regulations.

## 5.11 Elevation Surveying

All investigative locations were surveyed for horizontal and vertical control relative to geodetic benchmark plaque KI-66, which is located in Victoria Park, 35.4 m northwest of northerly gatepost of Schneider Avenue entrance. Benchmark plaque KI-66 has an elevation of 325.754 mAMSL. The ground surface and top of riser pipe elevation of each of the groundwater monitoring wells completed during the Phase Two ESA were surveyed with respect to the benchmark.

## 5.12 Quality Assurance and Quality Control Measures

A Quality Assurance/Quality Control (QA/QC) program was implemented during the Phase Two ESA to ensure quality data was generated, as documented in the SAP.

This program involved both field and laboratory QA/QC measures. The QA/QC program was initiated to ensure that if any form of sample contamination occurs, or if any lack of precision in the analytical methods employed is evident, the potential source and degree of the contamination or analytical imprecision can be identified and adequately addressed.

Samples were collected in clean laboratory-supplied sampling containers with the appropriate preservative and submitted under chain-of-custody protocol to ALS Laboratory Group for chemical analysis. Soil samples that were submitted for analysis of volatile parameters (e.g., VOCs and PHC fraction F1) were collected using the methanol preservation method. From the time of sample collection to the time of submission to the laboratory, samples were stored in a cooler with ice or ice packs to maintain sample integrity.

The following field measures were taken for quality assurance purposes:

- Between collection of each soil and groundwater sample, GHD field personnel donned a new pair of disposable nitrile gloves.



- Prior to use, and between each borehole location, the drilling and non-dedicated sampling equipment was scrubbed clean using a hard bristled brush (where needed), Alconox® soap, and potable water followed by a potable water rinse.
- Wherever possible, dedicated sampling equipment (e.g., LDPE tubing, fittings, Ziploc® bags, etc.) was used to reduce the potential for cross contamination.
- Groundwater samples collected for metals analysis were field filtered using dedicated 0.45 micron filters during sample collection.

To validate the field analysis, one QA/QC field duplicate sample was submitted for every ten samples submitted for laboratory analysis. Trip blanks were also submitted (one per laboratory submission) for soil and groundwater samples where analysis of volatile parameters was required.

QC samples were also analyzed by the laboratory as required by their analytical methods. Analytical results received by GHD were reviewed and verified. The verification program consists of reviewing the following parameters:

- Sample holding times
- Surrogate spike recoveries
- Method blank analysis
- Matrix spike and matrix spike duplicate recoveries
- Laboratory control sample analysis
- Calibration verification sample analysis
- Laboratory duplicate analysis
- Field duplicate analysis
- Trip blank analysis

A copy of the data verification memorandum is provided in Appendix E. Based on the review of the data verification memorandum, the analytical data generated during the Phase Two ESA are of acceptable precision and accuracy for their intended use with the qualifications noted in Appendix E.

## 6. Review and Evaluation

This review and evaluation section describes the results of the Phase Two ESA. An overview of the contents of each subsection is provided in the following table. The investigative locations are shown on Figure 2.

Section	Title	Contents
6.1	Geology	<ul style="list-style-type: none"><li>• Locations of geologic cross-sections (Figure 5)</li><li>• Geologic cross-sections (Figure 6 and Figure 7)</li></ul>



Section	Title	Contents
6.2	Groundwater: Elevations and Flow Direction	<ul style="list-style-type: none"> <li>• Summary of monitoring well completion details (Table 2)</li> <li>• Groundwater level measurements and elevations (Table 3)</li> <li>• Groundwater elevation contours (Figure 8)</li> </ul>
6.3	Groundwater: Hydraulic Gradients	<ul style="list-style-type: none"> <li>• Description of hydraulic conditions</li> <li>• Horizontal and vertical hydraulic gradients</li> </ul>
6.4	Hydraulic Conductivity	<ul style="list-style-type: none"> <li>• Hydraulic conductivity determination</li> </ul>
6.5	Soil Texture	<ul style="list-style-type: none"> <li>• Rationale for not using the Standards for fine-medium textured soil</li> </ul>
6.6	Soil: Field Screening	<ul style="list-style-type: none"> <li>• Discussion of field screening results</li> </ul>
6.7	Soil Quality	<ul style="list-style-type: none"> <li>• Location and depths of soil samples</li> <li>• Evaluation of soil analytical data compared to Site Condition Standards (Table 4)</li> <li>• Maximum soil concentrations (Table 5)</li> </ul>
6.8	Groundwater Quality	<ul style="list-style-type: none"> <li>• Locations and depths of groundwater samples</li> <li>• Evaluation of groundwater analytical data compared to Site Condition Standards (Table 6)</li> <li>• Maximum groundwater concentrations (Table 7)</li> <li>• Evidence to demonstrate no presence of NAPL</li> </ul>
6.9	Sediment Quality	<ul style="list-style-type: none"> <li>• No water bodies are located on the Property. Therefore, no sediment samples were collected.</li> </ul>
6.10	QA/QC Results	<ul style="list-style-type: none"> <li>• Review and summary of QA/QC analytical data</li> </ul>
6.11	Phase Two Conceptual Site Model	<ul style="list-style-type: none"> <li>• Description of PCAs and APECs</li> <li>• Potential contaminant distribution and preferential migration pathways</li> <li>• Geology and hydrogeology</li> <li>• Nature and extent of impacts</li> <li>• Potential exposure pathways human and ecological receptors</li> </ul>

## 6.1 Geology

The interpreted geological conditions at the Site are based on geologic conditions encountered during the Phase Two ESA completed by GHD. The materials and geologic deposits encountered at the Site during the Phase Two ESA consisted of the following:

- **Asphalt/Topsoil/Concrete** – A surficial layer of asphalt pavement, concrete or topsoil was encountered at the ground surface.
- **Gravelly Sand** – The asphalt/topsoil/concrete was underlain by a gravelly sand deposit containing varying amounts of silt that extended to approximately 6.09 mBGS.
- **Sandy Silt/Clay** – The gravelly sand deposit was underlain by a sandy silt/clay deposit that extended to a maximum depth of approximately 8.69 mBGS at monitoring well MW6-19.
- **Sand** – The sandy silt/clay deposit was underlain by a sand deposit that extended to the maximum depth investigated of approximately 9.14 mBGS.



Bedrock was not encountered at the Site during the Phase Two ESA. A review of published bedrock geologic mapping completed as part of the Phase One ESA indicated that the bedrock in the area of the Site is anticipated to be at a depth of approximately 56 mBGS.

Two geologic cross-sections were developed for the Site. The locations of the geologic cross-sections are shown on Figure 5. Geologic cross-sections A-A' and B-B' are shown on Figure 6 and Figure 7, respectively. These cross-sections depict the generalized extent of the stratigraphic units at the Site. The elevations displayed on the geologic cross-sections are in mAMSL.

## 6.2 Groundwater Elevations and Flow Direction

The monitoring well completion details are provided in Table 2 and a summary of the groundwater level measurements and elevations is provided in Table 3.

GHD measured the depth to groundwater and completed a NAPL check at each monitoring well on July 8, 2019 and September 17, 2019. The depth to groundwater was measured relative to a specific reference point in the monitoring well (i.e., the top of the monitoring well riser pipe). Based on the survey information of the top of riser pipe elevation, the groundwater surface or potentiometric elevation was determined (see Table 3) and used to prepare groundwater elevation contours for the Site. The September 17, 2019 groundwater level measurements indicate that the shallow groundwater table is present at depths ranging from 5.23 mBGS at MW1-19 to 6.66 mBGS at MW6-19. The elevations of the groundwater table vary from 326.58 mAMSL at MW3-19 to 326.15 mAMSL at MW4-19. GHD also measured depth to groundwater at an off-Site monitoring well MW5-19, which is located within the Belmont Lane East road allowance, adjacent to the east of the Site. The depth to groundwater at MW5-19 was measured to be 5.85 mBGS with a groundwater elevation of 325.83 mAMSL on September 17, 2019. The measurements collected at MW5-19 were used to assist in determining the groundwater flow direction across the Site.

Groundwater elevation contours were prepared based on the groundwater level measurements collected on September 17, 2019, and are presented on Figure 8. The groundwater elevation contours indicate that shallow groundwater flow is generally in an easterly direction.

NAPL was not encountered at any of the monitoring well locations.

## 6.3 Groundwater Hydraulic Gradients

The horizontal hydraulic gradient across the Site, based on groundwater elevations, is approximately 0.02 metres per metre (m/m).

Vertical hydraulic gradients could not be assessed as no monitoring well nests or deeper screened monitoring wells were installed at the Site.



## 6.4 Hydraulic Conductivity

Hydraulic conductivity values (commonly referred to as k-values) for each of the major stratigraphic units were estimated using generally accepted ranges<sup>7</sup> for the stratigraphic conditions observed and recorded by field personnel. The estimated soil hydraulic conductivity range for the sand with varying amount of gravel and silt is  $10^{-5}$  to  $10^1$  centimetres per second (cm/s). The estimated soil hydraulic conductivity range for the clay and silt seam within the sand silt is  $10^{-9}$  to  $10^{-4}$  centimetres per second (cm/s).

## 6.5 Soil Texture

Soil grain size analysis was not completed as part of the Phase Two ESA. Therefore, when evaluating the soil and groundwater sample analytical results, GHD applied the more conservative MECP Table 2 Standards for coarse-textured soil.

## 6.6 Soil: Field Screening

During borehole advancement, GHD completed soil field screening by monitoring the soil samples for organic vapours with a PID and documenting any visual or olfactory evidence of potential impact, as discussed in Sections 5.3 and 5.4.

The results of the soil field screening and corresponding sample depth intervals are provided on the stratigraphic and instrumentation logs provided in Appendix C.

Elevated PID readings (i.e., greater than 100 ppm) were not observed during the Phase Two ESA.

## 6.7 Soil Quality

A total of six soil samples (including one field duplicate sample) were collected and submitted for chemical analysis of one or more of the following parameters during the Phase Two ESA:

- Metals
- PAHs
- PHC fractions F1 to F4
- VOCs
- pH

A summary of the soil sampling locations and chemical analysis is provided in Table 1.

The soil analytical data, compared to the MECP Table 2 Standards, are provided in Table 4. A summary of the maximum soil concentration data is provided in Table 5.

All soil samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs, VOCs and pH at all investigative locations.

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<sup>7</sup> Freeze, R.A., and Cherry, J.A., 1979, Groundwater: Englewood Cliffs, NJ, Prentice-Hall, 604 p



Based on the results of the Phase Two ESA, there is no evidence of soil impacts related to any of the APECs identified at the Site.

## 6.8 Groundwater Quality

A total of five groundwater samples (including one field duplicate sample) were collected and submitted for chemical analysis of one or more of the following parameters during the Phase Two ESA completed at the Site:

- Metals
- PAHs
- PHC fractions F1 to F4
- VOCs

A summary of groundwater sampling locations and chemical analysis is provided in Table 1.

The groundwater analytical data, compared to the MECP Table 2 Standards, are provided in Table 6. A summary of the maximum groundwater concentration data is provided in Table 7.

All groundwater samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs and VOCs at all investigative locations, with the exception of sodium at three monitoring well locations.

Sodium detected in groundwater at the Property is interpreted to be associated with the application of road salt to the exterior surfaces of the Site and on the adjacent municipal roadways for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. Therefore, in accordance with Section 49.1 of O. Reg. 153/04 that came into effect in December 2019, sodium was not identified as Contaminant of Concern (COC) at the Property.

Based on the above, no COCs were identified in groundwater.

## 6.9 Sediment Quality

Sediment sampling was not completed during the Phase Two ESA as no surface water bodies are located on the Site.

## 6.10 Quality Assurance and Quality Control (QA/QC) Results

One soil field duplicate sample and one groundwater field duplicate sample were analyzed during the Phase Two ESA. One trip blank sample was submitted for each groundwater sample and soil sample submission that contained samples to be analyzed for either PHC fraction F1 or VOCs. The QA/QC samples were also analyzed by the laboratory as required by their analytical methods. Analytical results received by GHD were reviewed and verified. As noted previously in Section 5.12, a copy of the data quality assessment and verification memorandum is provided in Appendix E.

Based on the results of the data quality assessment and validation, the results are considered suitable for their intended use with applicable qualifications. Qualifications associated with the analytical results are noted next to the respective data in Tables 4 through 7.





## 6.11 Phase Two Conceptual Site Model

The following presents a Conceptual Site Model (CSM) of the Phase Two Environmental Site Assessment (ESA) Property located on the western parcel of 660 Belmont Avenue West, Kitchener, Ontario (Site or Property).

### 6.11.1 Introduction

The Site is approximately 0.25 hectares (0.6 acres) in size and contains a single-storey commercial building that was constructed in 1961. Based on discussions with the Site representative and review of historical records, the Site building has been utilized for automotive repair and maintenance operations since the Site was developed for commercial purposes in 1961. No information was available regarding the use of the Site between 1858 and 1960; although it is likely that the Property was either used for agricultural or consisted of vacant land during that period. The proposed future use of the Site is for mixed commercial and residential purposes. A Site Location Map and a Site Plan are provided on Figure 1 and Figure 2, respectively. The final locations of any proposed future buildings and/or structures on the Site are currently unknown.

GHD completed a Phase One ESA of the Site in May 2019. The results of GHD's Phase One ESA are summarized in the report entitled "Phase One Environmental Site Assessment, Western Parcel of 660 Belmont Avenue West, Kitchener, Ontario", dated April 2020. The Phase One ESA was completed in accordance with Ontario Regulation 153/04, as amended (O. Reg. 153/04). Potentially contaminating activities (PCAs), as defined in O. Reg. 153/04, that have been identified on, in, or under the Phase One ESA property, or located within the Phase One ESA study area and having the potential to contribute to an area of potential environmental concern (APEC), were identified in the Phase One ESA. A Phase Two ESA was completed by GHD to investigate soil and groundwater quality at the Site associated with the APECs identified during the Phase One ESA. The Phase Two ESA activities completed at the Site included the following:

- Completion of public and private utility locates
- Advancement of boreholes
- Installation of groundwater monitoring wells
- Collection of field soil screening measurements and observations
- Collection of soil and groundwater samples
- Field measurements of groundwater quality parameters
- Hydraulic monitoring (groundwater level measurements and measurements for non-aqueous phase liquid [NAPL], if present)
- Quality assurance and quality control (QA/QC) measures
- Elevation Surveying
- Analytical testing
- Residue management



The QP<sub>ESA</sub> determined that the sampling program (including the QA/QC program) undertaken during the Phase Two ESA met the requirements of O. Reg. 153/04 and was sufficient to ensure the quality and reliability of the analytical results. A summary of the APECs identified at the Site and the associated PCAs is provided in the section below.

The following deviation from the sampling and analysis plan occurred during the Phase Two ESA field activities:

- Following installation, one of the monitoring wells (MW2-19) was found to be dry. The screen and riser pipe were removed from the location of MW2-19 and the borehole was overdrilled to facilitate the installation of a deeper monitoring well (MW6-19) as a replacement for MW2-19.

#### 6.11.2 Potentially Contaminating Activities and Areas of Potential Environmental Concern

The purpose of the Phase Two ESA was to investigate the APECs identified in the Phase One ESA. The objective of the Phase Two ESA was to investigate soil and groundwater quality present in the APECs identified at the Site. The locations of the APECs identified at the Site and the locations of PCAs identified within the Phase One ESA study area are shown on Figure 3 and Figure 4, respectively. A summary of the APECs identified at the Site and associated PCA(s) is provide below:

Area of Potential Environmental Concern	Potentially Contaminating Activity	Location
APEC #1 – Current and Historical Gasoline Service Station (off-Site)	28. Gasoline and Associated Products Storage in Fixed Tanks	- Southern Property boundary
APEC #2 – Site Operations (on-Site)	27. Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles	- East-central portion of the Property
APEC #3 – Chemical Storage (on-Site)	8. Chemical Manufacturing, Processing and Bulk Storage	- North-central portion of the building
APEC #4 – Chemical Storage (on-Site)	8. Chemical Manufacturing, Processing and Bulk Storage	- Central portion of the building

Additional details regarding the APECs identified to be associated with the Site are provided below:

- **APEC #1 – Current and Historical Gasoline Service Stations (off-Site):** Based on the review of historical records, the property immediately to the south of the Site at 638 Belmont Avenue West was historically operated as a gasoline service station. Furthermore, at the time of the Site inspection GHD observed a gasoline service station located approximately 30 metres (m) southwest of the Site at 200 Glasgow Street. The historical and current operation of gasoline service stations with fuel tanks at 638 Belmont Avenue West and 200 Glasgow Street were identified as PCAs (#28 – Gasoline and Associated Products Storage in Fixed Tanks) in accordance with O. Reg. 153/04. Due to the close proximities of these properties to the Site, these PCAs were identified as having the potential to contribute to an APEC at the Site. As such, the southern portion of the Property was identified as **APEC #1**.



- APEC #2 – Site Operations:** Based on discussions with the Site representative and review of historical records, the Site has been utilized as an automotive repair and maintenance facility since the early 1960s. The operation of an automotive repair and maintenance facility at the Site was identified as a PCA (#27 – Garages and Maintenance and Repair of Railcars, Marine Vehicles and Aviation Vehicles) in accordance with O. Reg. 153/04. As such, the area of the maintenance shop on the east-central portion of the western parcel was identified as **APEC #2**.
- APEC #3 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, two 750-litre (200-gallon) used oil aboveground storage tanks (ASTs) and one 1,000-litre tote containing used coolant/antifreeze were located in the north-central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the used oil tanks and used coolant/antifreeze tote in the north-central portion of the building was identified as **APEC #3**.
- APEC #4 – Chemical Storage:** Based on observations made by GHD at the time of the Site inspection, one 1,135-litre engine oil AST and two 550-litre totes containing motor oil in the central portion of the building. The storage of the above-noted chemicals at the Site was identified as a PCA (#8 – Chemical Manufacturing, Processing and Bulk Storage) in accordance with O. Reg. 153/04. As such, the area of the engine oil AST and motor oil totes in the central portion of the building was identified as **APEC #4**.

**PCAs Excluded as APECs and Rationale**

As part of the Phase One ESA, additional PCAs were identified within the Phase One ESA study area that were determined not to be contributing to an APEC at the Site (shown on Figure 4). A summary of each such PCA, and the rationale for exclusion, is presented below:

Property Address	PCA(s), in accordance with O. Reg. 153/04	Rationale for Exclusion
137 Glasgow Street (approximately 60 m southeast of the Site)	#47 – Rubber Manufacturing and Processing	137 Glasgow Street is hydraulically cross-gradient of the Site
Approximately 20 m to the east of the Site	#46 – Rail Yards, Tracks and Spurs	Straight run tracks with no sidings that would have been used for storage of railway cars or off-loading of materials
683 Belmont Avenue West (50 m northwest of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	683 Belmont Avenue West is hydraulically cross-gradient of the Site
707 Belmont Avenue West (125 m northwest of the Site)	#37 – Operation of Dry Cleaning Equipment (where chemicals are used)	Due to the distance (125 m) and location of 707 Belmont Avenue West with respect to the Site (i.e., hydraulically cross-gradient)
233 Glasgow Street (195 m southwest of the Site)	#54 – Textile Manufacturing and Processing	Distance between 233 Glasgow Street and the Site



Property Address	PCA(s), in accordance with O. Reg. 153/04	Rationale for Exclusion
592 Belmont Avenue West (165 m south of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Distance between the Site and 592 Belmont Avenue West
115 Union Boulevard (240 m north of the Site)	#28 – Gasoline and Associated Products Storage in Fixed Tanks	Distance between the Site and 115 Union Boulevard

### 6.11.3 Potential Contaminant Distribution and Preferential Migration Pathways

Underground utilities at the Site include storm and sanitary sewers, potable water, natural gas, and telecommunication lines. During the Phase Two ESA, the groundwater table at the Site was encountered to be a depth of 5.23 metres below ground surface (mBGS). Since the groundwater table is located well below the depth of any underground utilities, the below grade utilities would not act as preferential migration pathways or affect the distribution of contaminants. Furthermore, based on the results of the Phase Two ESA, no COCs were identified in groundwater at the Site.

### 6.11.4 Geology and Hydrogeology

#### *Geological Characteristics*

The materials and geologic deposits encountered during Phase Two ESA consist of the following:

- **Asphalt/Topsoil/Concrete** – A surficial layer of asphalt pavement, concrete or topsoil was encountered at the ground surface.
- **Gravelly Sand** – The asphalt/topsoil/concrete was underlain by a gravelly sand deposit containing varying amounts of silt that extended to approximately 6.09 mBGS.
- **Sandy Silt/Clay** – The gravelly sand deposit was underlain by a sandy silt/clay deposit that extended to a maximum depth of approximately 8.69 mBGS at monitoring well MW6-19.
- **Sand** – The sandy silt/clay deposit was underlain by a sand deposit that extended to the maximum depth investigated of approximately 9.14 mBGS.

Bedrock was not encountered at the Site during the Phase Two ESA. A review of published bedrock geologic mapping completed indicated that the bedrock in the area of the Site is anticipated to be at a depth of approximately 56 mBGS.

Two geologic cross-sections were prepared for the Site. These geologic cross-sections depict the generalized stratigraphy across the Site as well as the groundwater elevation. The locations of the geologic cross-sections are shown on Figure 5. Geologic cross-sections A-A' and B-B' are shown on Figure 6 and Figure 7, respectively. The elevations displayed on the cross-sections are in mAMSL.

#### *Hydrogeological Characteristics*

GHD measured the depth to groundwater and completed a check for the presence of any NAPL at each monitoring well on July 8, 2019 and September 17, 2019. The depth to groundwater was



measured relative to a specific reference point in the monitoring well (i.e., the top of the monitoring well riser pipe).

Based on the survey information of the top of riser pipe elevation, the groundwater surface or potentiometric elevation was determined and used to prepare groundwater elevation contours for the Site. The September 17, 2019 groundwater level measurements indicate that the shallow groundwater table is present at depths ranging from 5.23 mBGS at MW1-19 to 6.66 mBGS at MW6-19. The elevations of the groundwater table vary from 326.58 mAMSL at MW3-19 to 326.15 mAMSL at MW4-19. GHD also measured depth to groundwater at an off-Site monitoring well MW5-19, which is located within the Belmont Lane East road allowance, adjacent to the east of the Site. The depth to groundwater at MW5-19 was measured to be 5.85 mBGS with a groundwater elevation of 325.83 mAMSL on September 17, 2019. The measurements collected at MW5-19 were used to assist in determining the groundwater flow direction across the Site.

Groundwater elevation contours were prepared based on the groundwater level measurements collected on September 17, 2019, and are presented on Figure 8. The groundwater elevation contours indicate that shallow groundwater flow is generally in an easterly direction.

The horizontal hydraulic gradient across the Site, based on groundwater elevations, is approximately 0.02 metres per metre (m/m). Vertical hydraulic gradients could not be assessed as no monitoring well nests or deeper screened monitoring wells were installed at the Site.

NAPL was not encountered at any of the monitoring well locations.

#### 6.11.5 Nature and Extent of Impacts

Based on the results of the Phase Two ESA, the Site is not considered to be environmentally sensitive, as defined in Section 41 of O. Reg. 153/04. Furthermore, based on the geology encountered during the Phase Two ESA, the Site was not determined to be a shallow soil property or located within 30 m of a water body, as defined in Section 43.1 of the O. Reg. 153/04. In addition, shallow groundwater (i.e., less than 3.0 mBGS) was not encountered at the Site. As such, Ministry of the Environment, Conservation and Parks (MECP) Table 2 Standards<sup>8</sup> were determined to be applicable standards for the Site.

There was no indication that climate or meteorological conditions have influenced the distribution or migration of any COCs. A summary of the soil and groundwater quality at the Property is provided below:

#### *Areas Where Soil has been brought from Another Property*

Based on the results of the Phase One and the Phase Two ESAs, there was no evidence of any fill materials present at the Site.

---

<sup>8</sup> "Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", prepared by MECP, dated April 15, 2011. Table 2 – Full Depth Generic Site Condition Standards in a Potable Ground Water Condition (MECP Table 2 Standards)



### Soil Quality

A total of six soil samples (including one field duplicate sample) were collected and submitted for chemical analysis of one or more of the following parameters during the Phase Two ESA completed at the Site:

- Metals
- Polycyclic aromatic hydrocarbons (PAHs)
- Petroleum hydrocarbon (PHC) fractions F1 to F4
- Volatile organic compounds (VOCs)
- pH

A summary of the investigative locations associated with each APEC is provided below:

Area of Potential Environmental Concern	Contaminants of Concern in Soil	Investigative Locations
APEC #1 – Current and Historical Gasoline Service Station (off-Site)	Not Applicable	None
APEC #2 – Site Operations (on-Site)	Metals, PAHs, PHCs, VOCs, pH	MW1-19, MW2-19
APEC #3 – Chemical Storage (on-Site)	Metals, PAHs, PHCs, VOCs	BH3-19
APEC #4 – Chemical Storage (on-Site)	Metals, PAHs, PHCs, VOCs	BH4-19

All soil samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs, VOCs and pH at all investigative locations.

Based on the results of the Phase Two ESA, there is no evidence of soil impacts related to any of the APECs identified at the Site.

### Groundwater Quality

A total of five groundwater samples (including one field duplicate sample) were collected and submitted for chemical analysis of one or more the following parameters during the Phase Two ESA completed at the Site:

- Metals
- PAHs
- PHC fractions F1 to F4
- VOCs



A summary of the investigative locations associated with each APEC is provided below:

Area of Potential Environmental Concern	Contaminants of Concern in Groundwater	Investigative Locations
APEC #1 – Current and Historical Gasoline Service Station (off-Site)	Metals, PAHs, PHCs, VOCs	MW3-19, MW4-19
APEC #2 – Site Operations	Metals, PAHs, PHCs, VOCs	MW1-19 MW6-19
APEC #3 – Chemical Storage (on-Site)	Not Applicable	None
APEC #4 – Chemical Storage (on-Site)	Not Applicable	None

All groundwater samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs and VOCs at all investigative locations, with the exception of sodium at three monitoring well locations.

Sodium detected in groundwater at the Property is interpreted to be associated with the application of road salt to the exterior surfaces of the Site and on the adjacent municipal roadways for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. Therefore, in accordance with Section 49.1 of O. Reg. 153/04 that came into effect in December 2019, sodium was not identified as Contaminant of Concern (COC) at the Property.

Based on the above, no COCs were identified in groundwater and there is no evidence of groundwater impacts related to any of the APECs identified at the Site.

#### 6.11.6 Potential Exposure Pathways for Human and Ecological Receptors

Based on the results of the Phase Two ESA investigations, no COCs were identified in soil or groundwater at the Site. Therefore, no potential exposure pathways for human or ecological receptors were identified at the Site.

## 7. Conclusions

The Phase Two ESA was completed to support the filing of a RSC for change in land use from commercial to mixed commercial and residential, as required under O. Reg. 153/04. Based on the results of the Phase Two ESA, the following conclusions are provided:

### ***COCs in Soil***

No COCs were identified in soil since all soil samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs, VOCs and pH at all investigative locations.



### *COCs in Groundwater*

All groundwater samples submitted for laboratory analysis met the applicable MECP Table 2 Standards for metals, PAHs, PHCs and VOCs at all investigative locations, with the exception of sodium at three monitoring well locations.

Sodium detected in groundwater at the Property is interpreted to be associated with the application of road salt to the exterior surfaces of the Site and on the adjacent municipal roadways for the safety of vehicular or pedestrian traffic under conditions of snow or ice or both. Therefore, in accordance with Section 49.1 of O. Reg. 153/04 that came into effect in December 2019, sodium was not identified as COC at the Property.

Based on the above, no COCs were identified in groundwater.

### *Conclusion*

Based on the results of the Phase Two ESA, a RSC for change in land use to mixed commercial and residential can be filed with the MECP.

All of Which is Respectfully Submitted,  
GHD

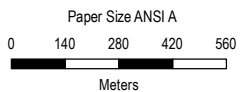
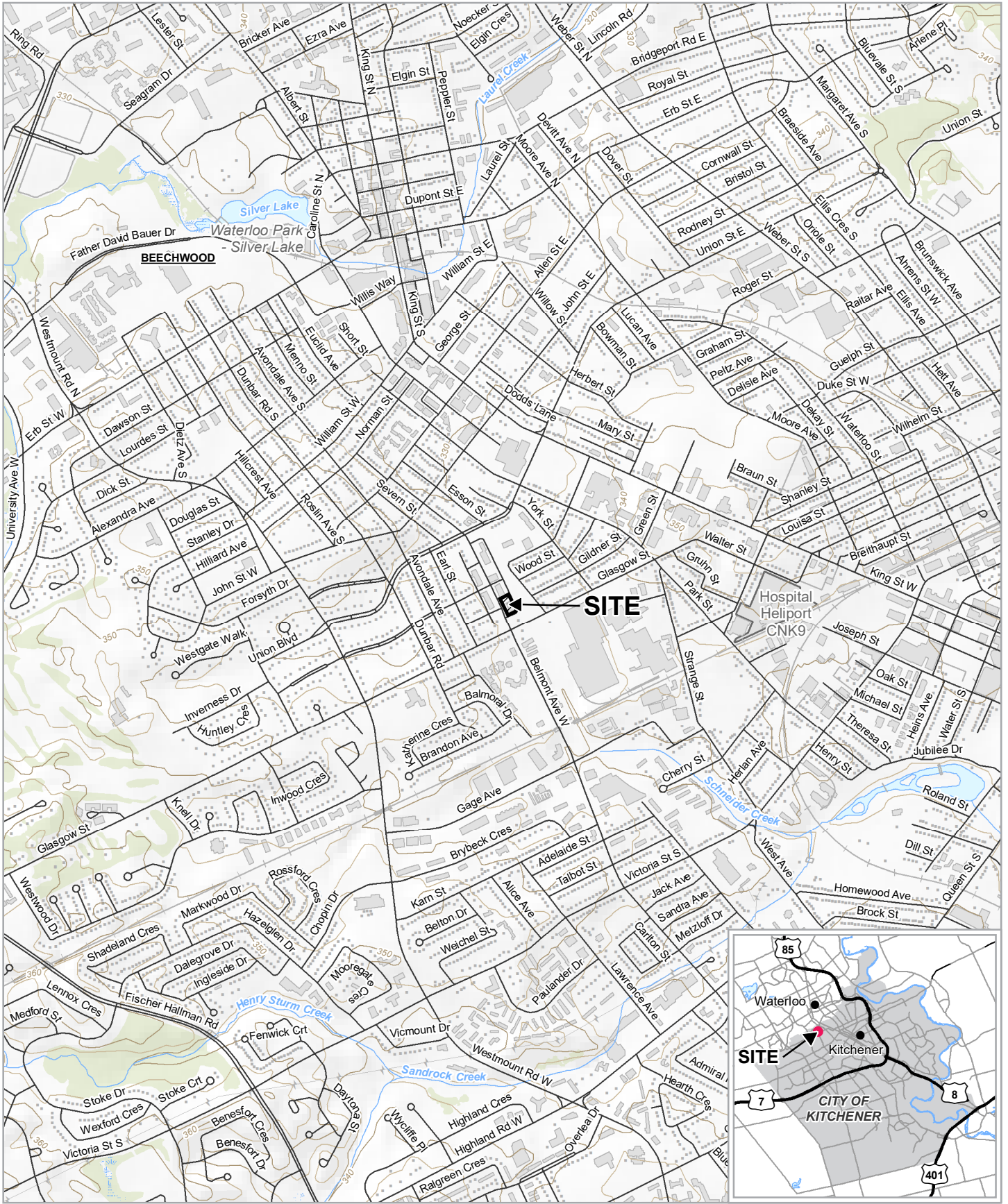
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Natalie A. Smith, P. Eng.

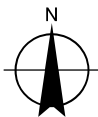
A handwritten signature in blue ink, appearing to read "G. Brooks".

Gregory R. Brooks, P. Eng.





Map Projection: Transverse Mercator  
 Horizontal Datum: North American 1983  
 Grid: NAD 1983 UTM Zone 17N

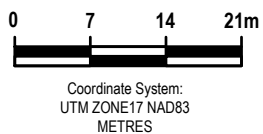
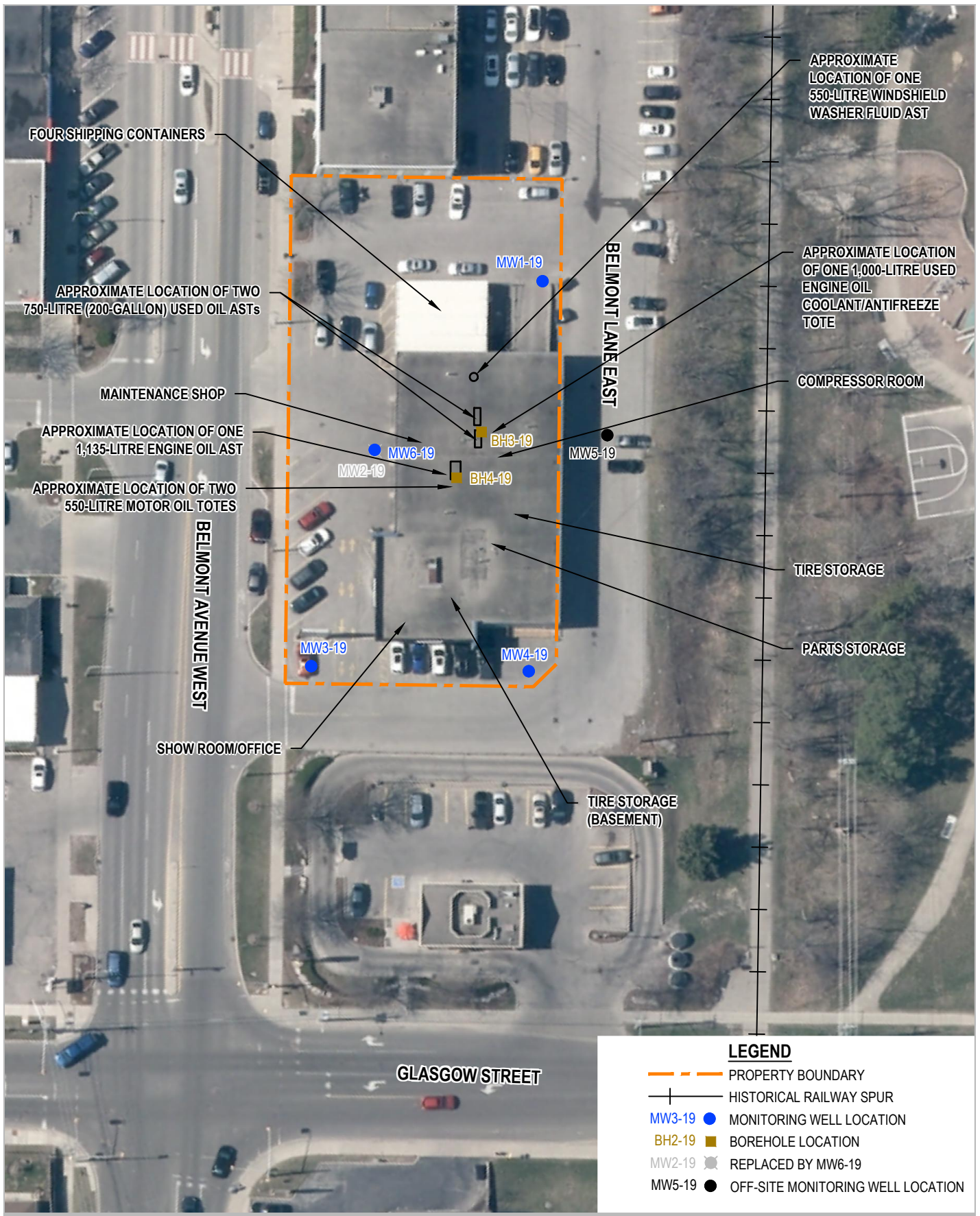


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
 KITCHENER, ONTARIO  
 PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Project No. 11196246  
 Revision No. -  
 Date Apr 14, 2020

**SITE LOCATION MAP**

**FIGURE 1**

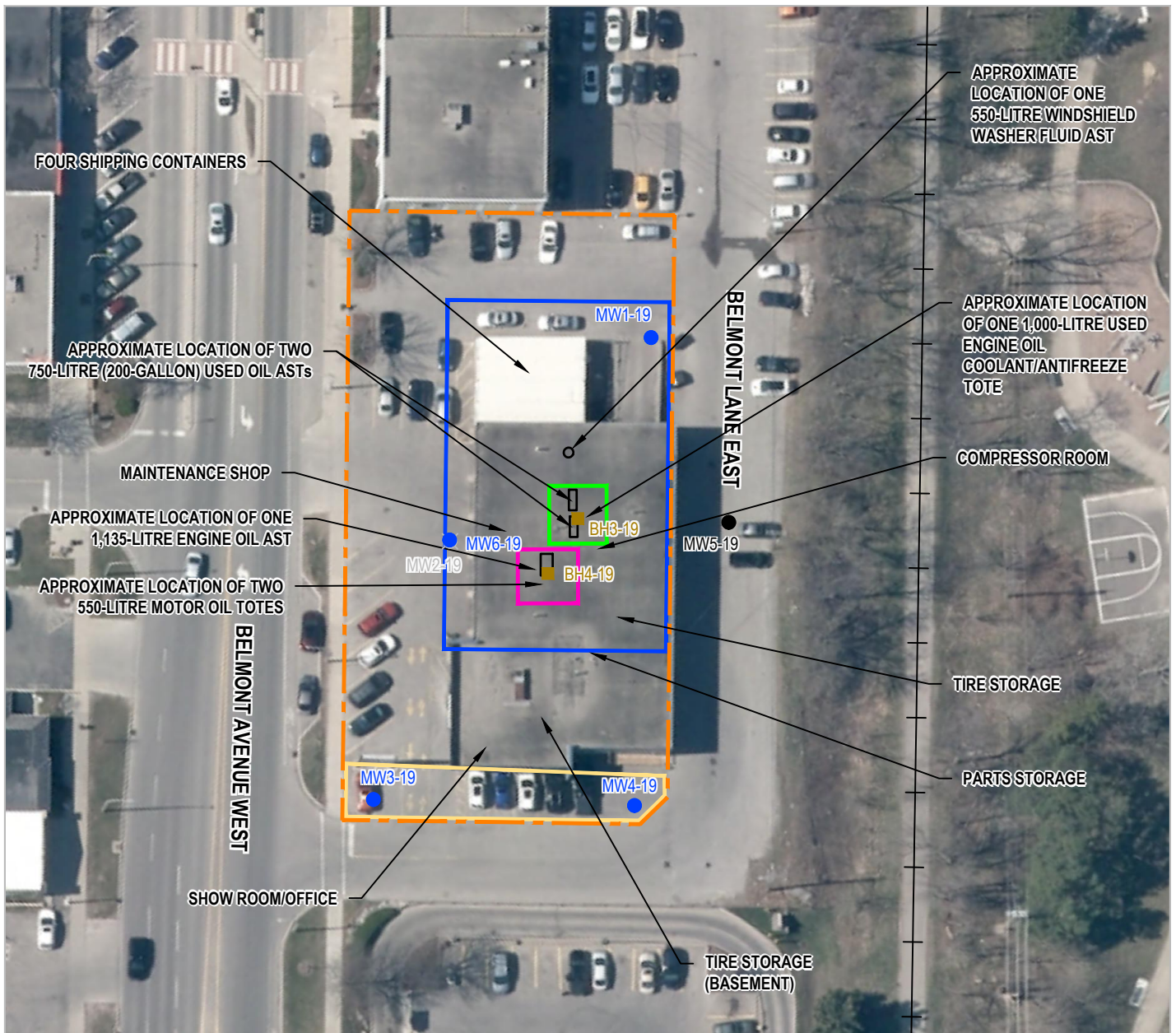


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
KITCHENER, ONTARIO  
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Project No. 11196246  
Date April 2020

**SITE PLAN AND INVESTIGATIVE LOCATIONS**

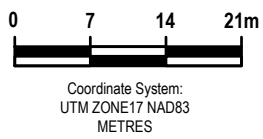
**FIGURE 2**



- APEC #1**  
CURRENT AND HISTORICAL GASOLINE SERVICE STATIONS (OFF-SITE)  
(PCA #28)
- APEC #2**  
SITE OPERATIONS  
(PCA #27)
- APEC #3**  
CHEMICAL STORAGE  
(PCA #8)
- APEC #4**  
CHEMICAL STORAGE  
(PCA #8)

- PCAs POTENTIALLY CONTRIBUTING TO APECs ON THE SITE**
- PCA #8 - CHEMICAL MANUFACTURING, PROCESSING AND BULK STORAGE
  - PCA #27 - GARAGES AND MAINTENANCE AND REPAIR OF RAILCARS, MARINE VEHICLES AND AVIATION VEHICLES
  - PCA #28 - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS

- LEGEND**
- PROPERTY BOUNDARY
  - HISTORICAL RAILWAY SPUR
  - MW3-19 MONITORING WELL LOCATION
  - BH2-19 BOREHOLE LOCATION
  - MW2-19 REPLACED BY MW6-19
  - MW5-19 OFF-SITE MONITORING WELL LOCATION

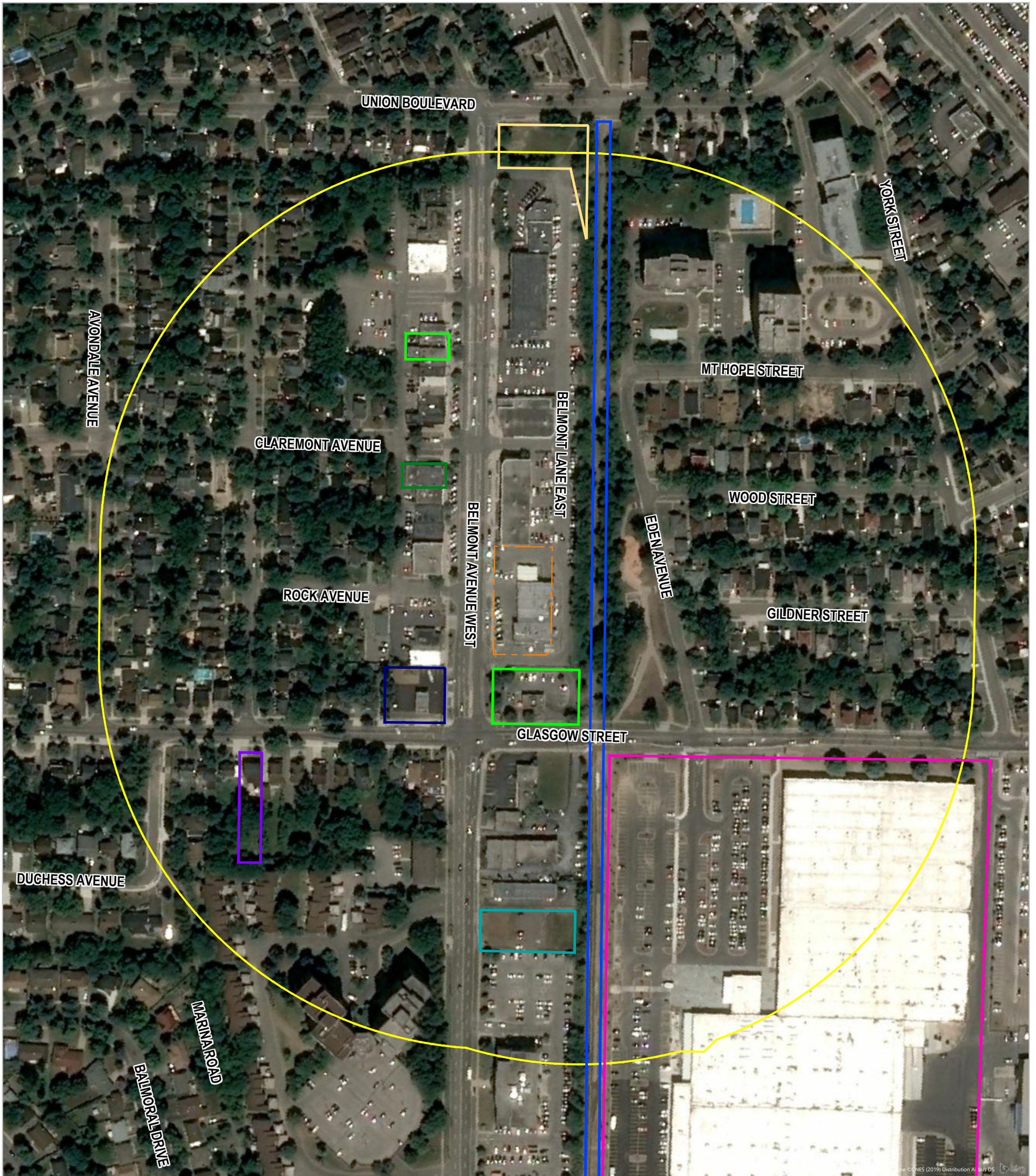










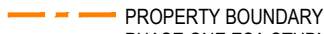

**WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
KITCHENER, ONTARIO  
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT**

Project No. **11196246**  
Date **April 2020**

**PHASE ONE CONCEPTUAL SITE  
MODEL-SITE**

**FIGURE 3**



	115 UNION STREET (PCA #28)		233 GLASGOW STREET (PCA #54)	<p><u>PCAs POTENTIALLY CONTRIBUTING TO APECs ON THE SITE</u></p> <p>PCA #28 - GASOLINE AND ASSOCIATED PRODUCTS STORAGE IN FIXED TANKS</p> <p>PCA #37 - OPERATION OF DRY CLEANING EQUIPMENT (WHERE CHEMICALS ARE USED)</p> <p>PCA #46 - RAIL YARDS, TRACKS AND SPURS</p> <p>PCA #47 - RUBBER MANUFACTURING AND PROCESSING</p> <p>PCA #54 - TEXTILE MANUFACTURING AND PROCESSING</p>
	HISTORICAL RAILWAY LINE (PCA #46)		200 GLASGOW STREET (PCA #28)	
	707 BELMONT AVENUE (PCA #37)			
	137 GLASGOW STREET (PCA #47)			
	592 BELMONT AVENUE (PCA #28)			
	638 BELMONT AVENUE (PCA #28)			
	683 BELMONT AVENUE (PCA #28)			
<p><b>LEGEND</b></p> <p> PROPERTY BOUNDARY</p> <p> PHASE ONE ESA STUDY AREA</p>				

0 25 50 75m

Coordinate System:  
UTM ZONE 17 NAD83  
METRES

Plan North



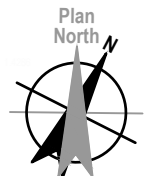
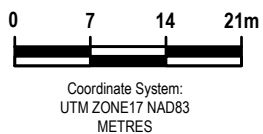
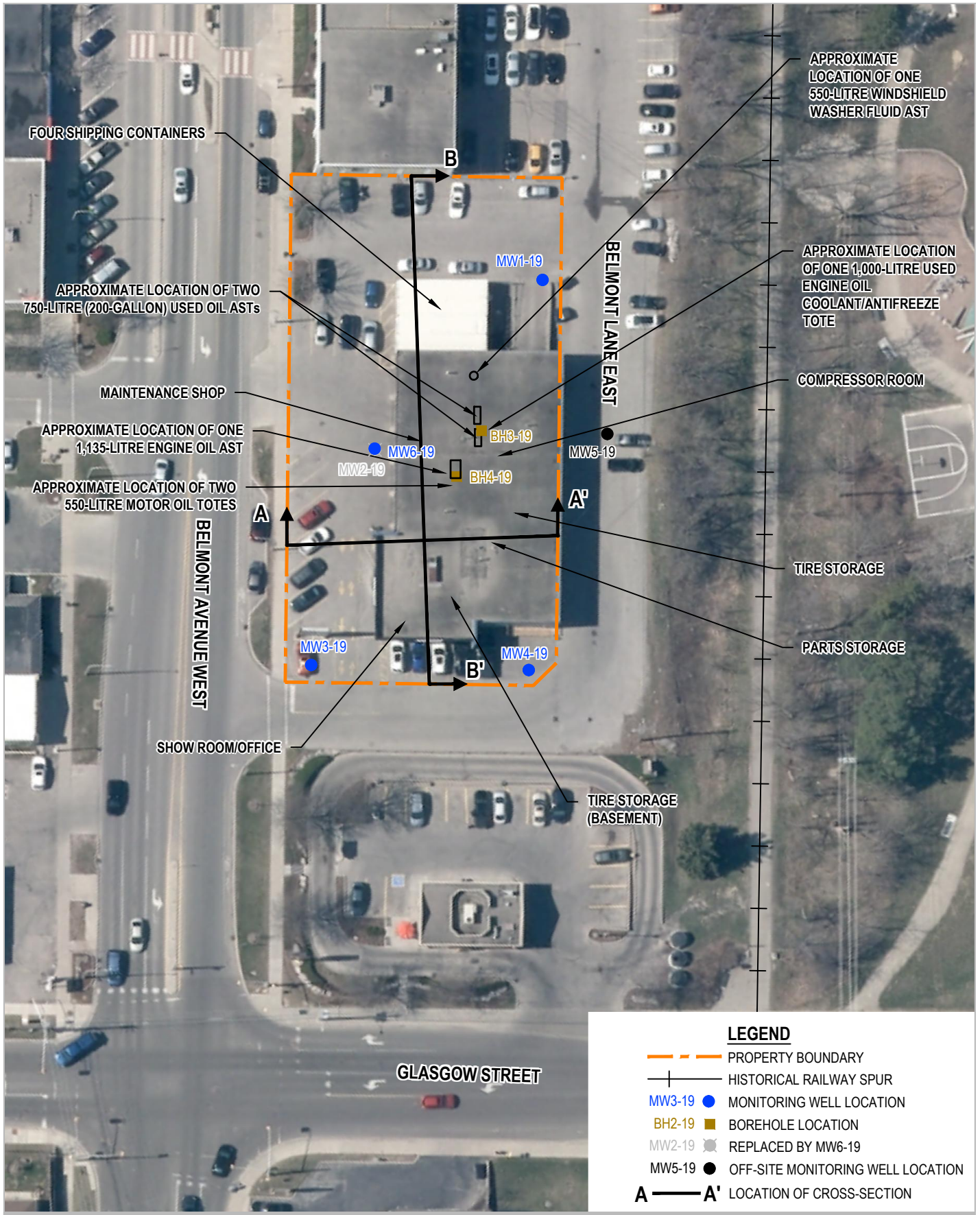


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
KITCHENER, ONTARIO  
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

**PHASE ONE CONCEPTUAL SITE  
MODEL-STUDY AREA**

Project No. 11196246  
Date April 2020

**FIGURE 4**

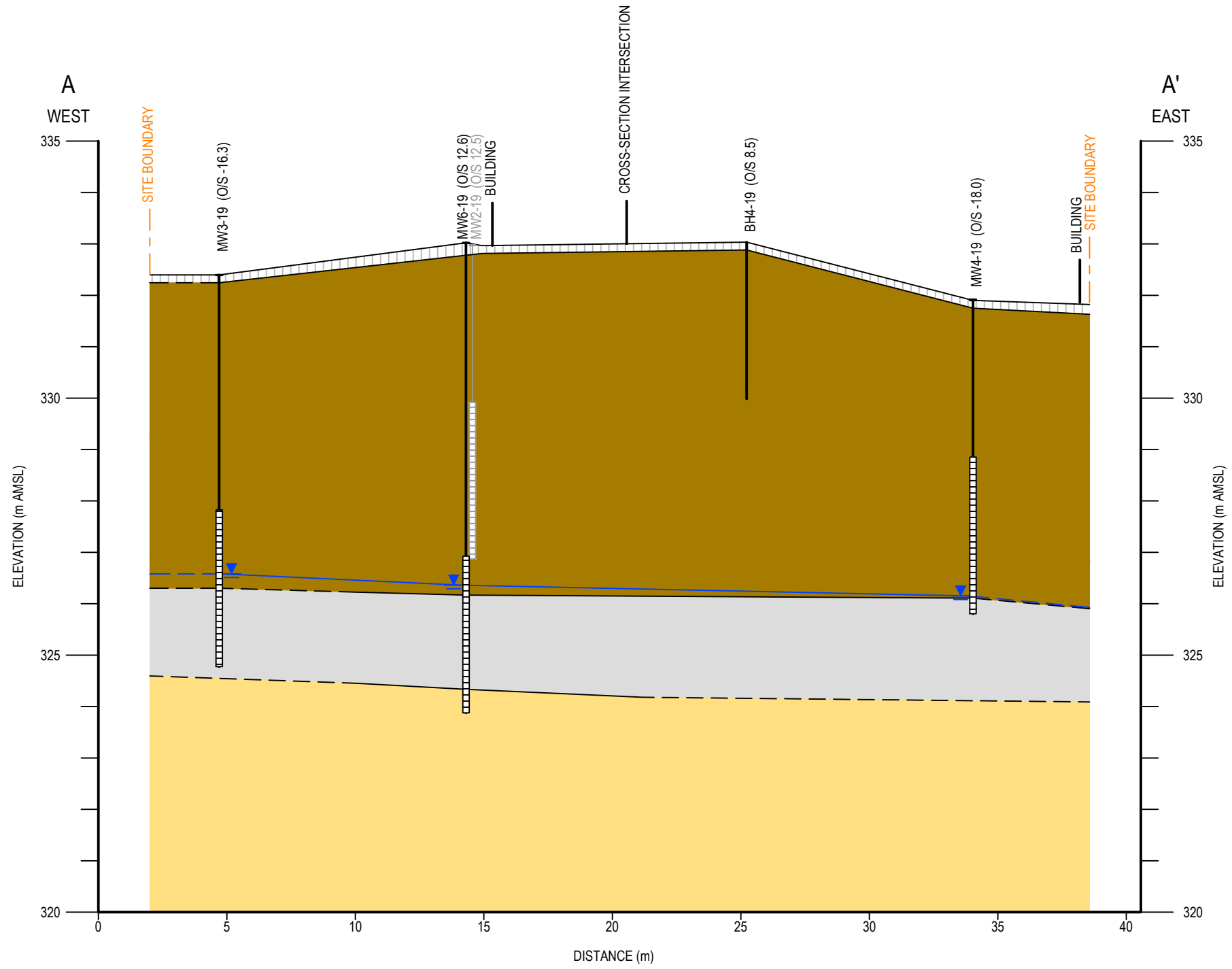


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
 KITCHENER, ONTARIO  
 PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

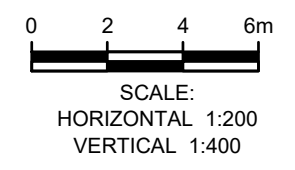
Project No. 11196246  
 Date April 2020

GEOLOGIC CROSS-SECTION LOCATIONS

**FIGURE 5**



LEGEND	
	WELL DESIGNATION
	GROUND SURFACE
	STRATIGRAPHIC BOUNDARY
	GW ELEVATION (SEP. 17, 2019)
	SCREENED INTERVAL
	BOTTOM OF BORING
	ASPHALT, TOPSOIL, CONCRETE
	GRAVELLY SAND
	SANDY SILT/CLAY
	SAND

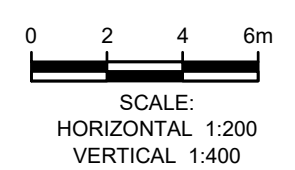
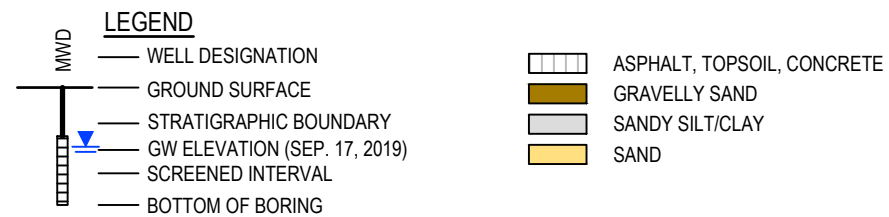
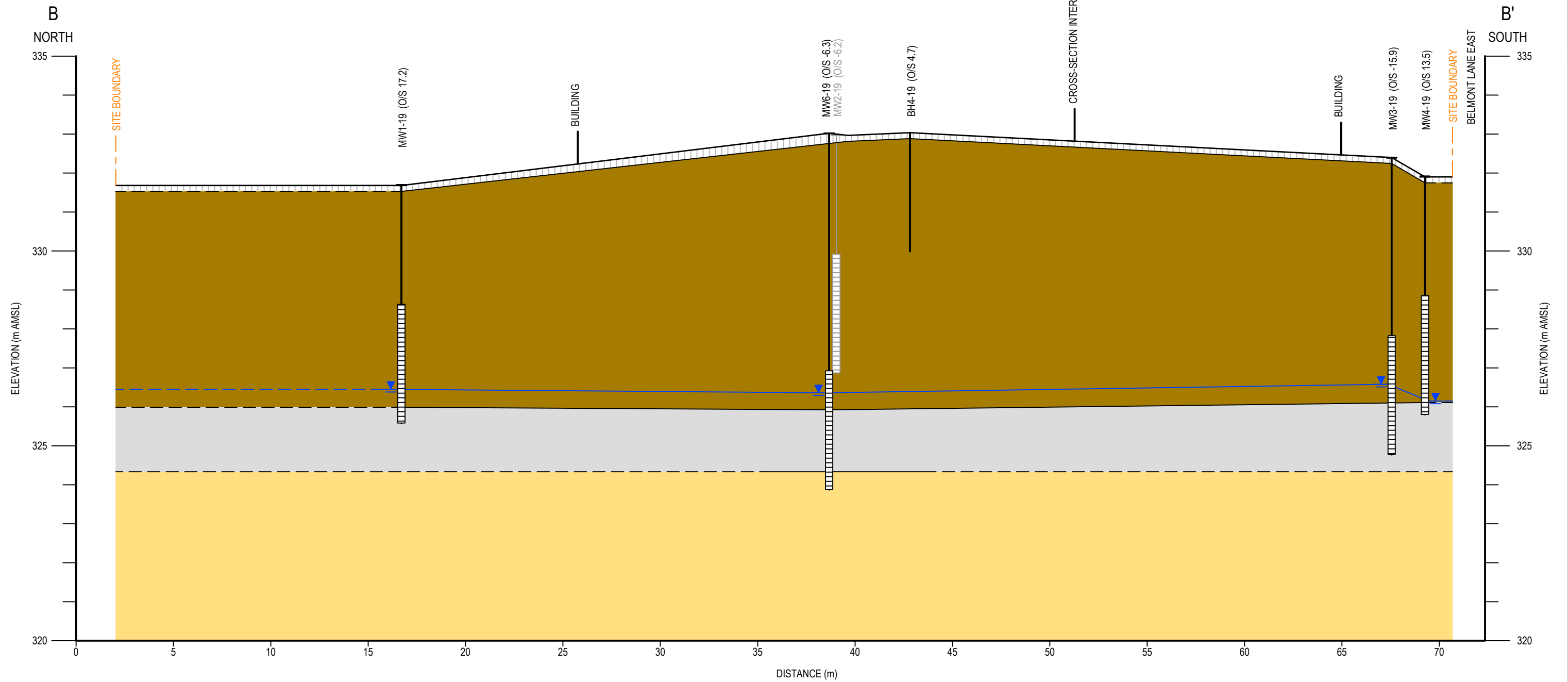


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
KITCHENER, ONTARIO  
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

Project No. 11196246  
Date April 2020

GEOLOGIC CROSS-SECTION A-A'

FIGURE 6

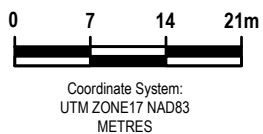
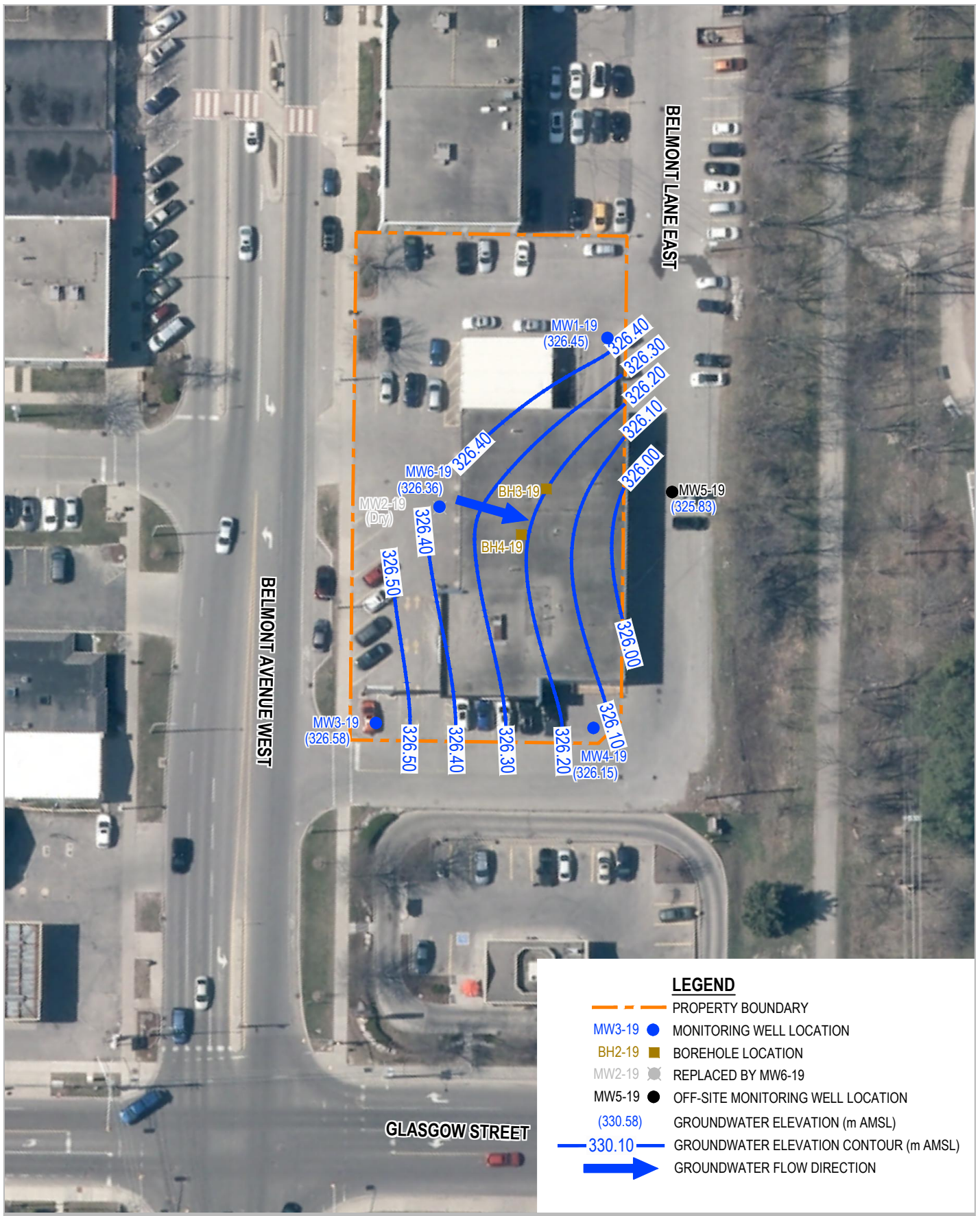


WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
 KITCHENER, ONTARIO  
 PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

**GEOLOGIC CROSS-SECTION B-B'**

Project No. 11196246  
 Date April 2020

**FIGURE 7**



WESTERN PARCEL OF 660 BELMONT AVENUE WEST  
KITCHENER, ONTARIO  
PHASE TWO ENVIRONMENTAL SITE ASSESSMENT

**GROUNDWATER ELEVATION CONTOURS  
(SEPTEMBER 17, 2019)**

Project No. 11196246  
Date April 2020

**FIGURE 8**



Table 1

**Summary of Sampling Locations and Chemical Analysis  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

	Location	Sample Identification	Sample Date	Sample Interval (mBGS)	Chemical Analysis				
					Metals	PAHs	PHCs F1 to F4	VOCs	pH
Soil Samples	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91	X	X	X	X	
	BH4-19	S-11196246-270619-BH4S	27-Jun-19	0.30 - 0.91		X	X		
	MW1-19	S-11196246-280619-MW1S	28-Jun-19	0.30 - 0.91	X	X	X	X	
	MW2-19	S-11196246-280619-MW2S	28-Jun-19	0.30 - 0.91	X	X	X	X	X
	MW2-19	S-11196246-280619-MW2S-99 <sup>(1)</sup>	28-Jun-19	0.30 - 0.91	X	X	X	X	
	MW2-19	S-11196246-280619-MW2D	28-Jun-19	2.13 - 2.74					X
Groundwater Samples	MW1-19	GW-11196246-070819-SO-MW1-19	8-Jul-19	3.05 - 6.10	X		X	X	
	MW3-19	GW-11196246-070819-SO-MW3-19	8-Jul-19	4.57 - 7.62	X		X	X	
	MW3-19	GW-11196246-070819-SO-MW100 <sup>(1)</sup>	8-Jul-19	4.57 - 7.62	X		X	X	
	MW4-19	GW-11196246-071119-SO-MW4-19	11-Jul-19	3.05 - 6.10		X	X	X	
	MW6-19	GW-11196246-091319-TB-MW6-19	13-Sep-19	6.10 - 9.14	X		X	X	

## Notes:

- (1) Field duplicate sample  
mBGS Metres below ground surface  
PAHs Polycyclic aromatic hydrocarbons  
PHCs Petroleum hydrocarbons  
VOCs Volatile organic compounds

Table 2

**Summary of Monitoring Well Completion Details  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Location	Completion Date	Ground Elevation (mAMSL)	Top of Riser Elevation (mAMSL)	Total Depth (mBGS)	Screened Interval		Sandpack Interval		Geologic Material at Screened Interval
					Depth (mBGS)	Elevation (mAMSL)	Depth (mBGS)	Elevation (mAMSL)	
MW1-19	28-Jun-19	331.68	331.54	6.10	3.05 - 6.10	328.63 - 325.58	2.44 - 6.10	329.24 - 325.58	Sand
MW2-19 <sup>(1)</sup>	28-Jun-19	332.97	332.83	6.10	3.05 - 6.10	329.92 - 326.87	2.44 - 6.10	330.53 - 326.87	Sand/Gravelly Sand
MW3-19	4-Jul-19	332.40	332.29	7.62	4.57 - 7.62	327.83 - 324.78	3.96 - 7.62	328.44 - 324.78	Sand
MW4-19	28-Jun-19	331.90	331.74	6.10	3.05 - 6.10	328.85 - 325.80	2.44 - 6.10	329.46 - 325.80	Gravelly Sand/Sand/Clay
MW6-19	12-Sep-19	333.02	332.91	9.14	6.10 - 9.14	326.92 - 323.88	5.49 - 9.14	327.53 - 323.88	Sandy Silt/Sand

## Notes:

mAMSL Metres above mean sea level

mBGS Metres below ground surface

<sup>(1)</sup> Monitoring well MW2-19 was replaced by MW6-19

Table 3

**Summary of Groundwater Level Measurements and Elevations  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Location	Ground Elevation (mAMSL)	Top of Riser Elevation (mAMSL)	8-Jul-19			17-Sep-19		
			Depth to Groundwater		Groundwater Elevation (mAMSL)	Depth to Groundwater		Groundwater Elevation (mAMSL)
			(mBTOR)	(mBGS)		(mBTOR)	(mBGS)	
<b>Shallow</b>								
MW1-19	331.68	331.54	5.03	5.17	326.51	5.09	5.23	326.45
MW2-19 <sup>(1)</sup>	332.97	332.83	dry	-	-	-	-	-
MW3-19	332.40	332.29	5.61	5.72	326.68	5.71	5.82	326.58
MW4-19	331.90	331.74	5.50	5.66	326.24	5.59	5.75	326.15
MW6-19	333.02	332.91	-	-	-	6.55	6.66	326.36

## Notes:

- (1) Monitoring well MW2-19 was replaced by MW6-19
- mAMSL Metres above mean sea level
- mBTOR Metres below top of riser
- mBGS Metres below ground surface
- Not measured

Table 4

**Summary of Soil Analytical Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

	<b>Sample Location:</b>	<b>BH3-19</b>	<b>BH4-19</b>	<b>MW1-19</b>	<b>MW2-19</b>	<b>MW2-19</b>	<b>MW2-19</b>
	<b>Sample ID:</b>	S-11196246-270619-BH3S	S-11196246-270619-BH4S	S-11196246-280619-MW1S	S-11196246-280619-MW2S	S-11196246-280619-MW2S-99	S-11196246-280619-MW2D
	<b>Sample Date:</b>	27-Jun-19	27-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19
	<b>Sample Depth (mBGS):</b>	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	2.13 - 2.74
	<b>MECP Table 2 Standards<sup>(1)</sup></b>					<b>Field Duplicate</b>	
<b>Parameters</b>							
<b>Volatile Organic Compounds (VOCs)</b>							
Acetone	16	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Benzene	0.21	ND(0.0068)	-	ND(0.0068)	ND(0.0068)	ND(0.0068)	-
Bromodichloromethane	1.5	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Bromoform	0.27	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Bromomethane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Carbon tetrachloride	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Chlorobenzene	2.4	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Chloroform	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Dibromochloromethane	2.3	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,2-Dibromoethane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,2-Dichlorobenzene	1.2	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,3-Dichlorobenzene	4.8	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,4-Dichlorobenzene	0.083	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Dichlorodifluoromethane	16	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,1-Dichloroethane	0.47	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,2-Dichloroethane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,1-Dichloroethylene	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
cis-1,2-Dichloroethylene	1.9	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
trans-1,2-Dichloroethylene	0.084	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Methylene Chloride	0.1	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,2-Dichloropropane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
cis-1,3-Dichloropropene	-	ND(0.030)	-	ND(0.030)	ND(0.030)	ND(0.030)	-
trans-1,3-Dichloropropene	-	ND(0.030)	-	ND(0.030)	ND(0.030)	ND(0.030)	-
1,3-Dichloropropene (cis & trans)	0.05	ND(0.042)	-	ND(0.042)	ND(0.042)	ND(0.042)	-
Ethylbenzene	1.1	ND(0.018)	-	ND(0.018)	ND(0.018)	ND(0.018)	-
n-Hexane	2.8	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Methyl ethyl ketone (MEK)	16	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Methyl isobutyl ketone (MIBK)	1.7	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Methyl tert butyl ether (MTBE)	0.75	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Styrene	0.7	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,1,1,2-Tetrachloroethane	0.058	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,1,1,2,2-Tetrachloroethane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Tetrachloroethylene	0.28	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Toluene	2.3	ND(0.080)	-	ND(0.080)	ND(0.080)	ND(0.080)	-
1,1,1-Trichloroethane	0.38	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
1,1,2-Trichloroethane	0.05	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Trichloroethylene	0.061	ND(0.010)	-	ND(0.010)	ND(0.010)	ND(0.010)	-
Trichlorofluoromethane	4	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-
Vinyl chloride	0.02	ND(0.020)	-	ND(0.020)	ND(0.020)	ND(0.020)	-
o-Xylene	-	ND(0.020)	-	ND(0.020)	ND(0.020)	ND(0.020)	-
m+p-Xylenes	-	ND(0.030)	-	ND(0.030)	ND(0.030)	ND(0.030)	-
Xylenes (Total)	3.1	ND(0.050)	-	ND(0.050)	ND(0.050)	ND(0.050)	-

Table 4

**Summary of Soil Analytical Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

	<b>Sample Location:</b>	<b>BH3-19</b>	<b>BH4-19</b>	<b>MW1-19</b>	<b>MW2-19</b>	<b>MW2-19</b>	<b>MW2-19</b>
	<b>Sample ID:</b>	S-11196246-270619-BH3S	S-11196246-270619-BH4S	S-11196246-280619-MW1S	S-11196246-280619-MW2S	S-11196246-280619-MW2S-99	S-11196246-280619-MW2D
	<b>Sample Date:</b>	27-Jun-19	27-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19
	<b>Sample Depth (mBGS):</b>	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	2.13 - 2.74
	<b>MECP Table 2 Standards<sup>(1)</sup></b>					<b>Field Duplicate</b>	
<b>Parameters</b>							
<b>Polycyclic aromatic hydrocarbons (PAHs)</b>							
Acenaphthene	7.9	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Acenaphthylene	0.15	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Anthracene	0.67	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(a)anthracene	0.5	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(a)pyrene	0.3	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(b)fluoranthene	0.78	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(g,h,i)perylene	6.6	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Benzo(k)fluoranthene	0.78	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Chrysene	7	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Dibenzo(ah)anthracene	0.1	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Fluoranthene	0.69	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Fluorene	62	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
Indeno(1,2,3-cd)pyrene	0.38	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
1+2-Methylnaphthalenes	0.99	ND(0.042)	ND(0.042)	ND(0.042)	ND(0.042)	ND(0.042)	-
1-Methylnaphthalene	0.99	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	-
2-Methylnaphthalene	0.99	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	ND(0.030)	-
Naphthalene	0.6	ND(0.013)	ND(0.013)	ND(0.013)	ND(0.013)	ND(0.013)	-
Phenanthrene	6.2	ND(0.046)	ND(0.046)	ND(0.046)	ND(0.046)	ND(0.046)	-
Pyrene	78	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	ND(0.050)	-
<b>Petroleum Hydrocarbons (PHCs)</b>							
PHC F1 (C6-C10)	55	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	-
PHC F2 (C10-C16)	98	ND(10)	ND(10)	ND(10)	ND(10)	ND(10)	-
PHC F3 (C16-C34)	300	ND(50)	ND(50)	88	ND(50)	ND(50)	-
PHC F4 (C34-C50)	2,800	ND(50)	ND(50)	310	ND(50)	ND(50)	-
<b>Metals</b>							
Antimony	7.5	1.5	-	ND(1.0)	ND(1.0)	ND(1.0)	-
Arsenic	18	3.0	-	2.5	2.1	2.5	-
Barium	390	27.5	-	21.2	22.3	25.4	-
Beryllium	4	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Boron (Hot Water Soluble)	1.5	ND(0.10)	-	ND(0.10)	0.23	0.23	-
Boron	120	6.9	-	6.2	6.2	6.6	-
Cadmium	1.2	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Chromium	160	14.8	-	10.0	10.7	10.7	-
Chromium VI	8	ND(0.20)	-	ND(0.20)	ND(0.20)	ND(0.20)	-
Cobalt	22	4.8	-	2.9	3.0	3.5	-
Copper	140	10.3	-	8.1	7.4	8.6	-
Lead	120	10.0	-	9.4	7.2	9.0	-
Mercury	0.27	0.0151	-	0.0137	0.0132	0.0141	-
Molybdenum	6.9	1.4	-	ND(1.0)	ND(1.0)	ND(1.0)	-
Nickel	100	8.0	-	6.0	6.5	7.0	-

**Table 4**  
**Summary of Soil Analytical Data**  
**Phase Two Environmental Site Assessment**  
**Western Parcel of 660 Belmont Avenue West**  
**Kitchener, Ontario**

	<b>Sample Location:</b>	<b>BH3-19</b>	<b>BH4-19</b>	<b>MW1-19</b>	<b>MW2-19</b>	<b>MW2-19</b>	<b>MW2-19</b>
	<b>Sample ID:</b>	S-11196246-270619-BH3S	S-11196246-270619-BH4S	S-11196246-280619-MW1S	S-11196246-280619-MW2S	S-11196246-280619-MW2S-99	S-11196246-280619-MW2D
	<b>Sample Date:</b>	27-Jun-19	27-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19	28-Jun-19
	<b>Sample Depth (mBGS):</b>	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	0.30 - 0.91	2.13 - 2.74
	<b>MECP Table 2 Standards<sup>(1)</sup></b>					<b>Field Duplicate</b>	
<b>Parameters</b>							
<b>Metals (cont'd)</b>							
Selenium	2.4	ND(1.0)	-	ND(1.0)	ND(1.0)	ND(1.0)	-
Silver	20	ND(0.20)	-	ND(0.20)	ND(0.20)	ND(0.20)	-
Thallium	1	ND(0.50)	-	ND(0.50)	ND(0.50)	ND(0.50)	-
Uranium	23	ND(1.0)	-	ND(1.0)	ND(1.0)	ND(1.0)	-
Vanadium	86	28.6	-	21.9	18.6	22.1	-
Zinc	340	54.1	-	40.9	33.4	37.7	-
<b>General Chemistry</b>							
pH (s.u.)	-	-	-	-	7.79	-	7.87

Notes:

All values are expressed in units of micrograms per gram (µg/g) unless noted otherwise

(1) "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011. Table 2: Full depth Generic Site Condition Standards in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, for coarse-textured soils (MECP Table 2 Standards)

ND(0.50) Parameter not detected at method detection limit stated in parenthesis

mBGS Metres below ground surface

**Summary of Maximum Soil Concentration Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Parameters	MECP Table 2 Standards <sup>(1)</sup>	Maximum Concentration	Sample Location	Sample ID	Sample Date	Sample Interval (mBGS)
<b>Volatile Organic Compounds (VOCs)</b>						
Acetone	16	ND(0.50)	-	-	-	-
Benzene	0.21	ND(0.0068)	-	-	-	-
Bromodichloromethane	1.5	ND(0.050)	-	-	-	-
Bromoform	0.27	ND(0.050)	-	-	-	-
Bromomethane	0.05	ND(0.050)	-	-	-	-
Carbon tetrachloride	0.05	ND(0.050)	-	-	-	-
Chlorobenzene	2.4	ND(0.050)	-	-	-	-
Chloroform	0.05	ND(0.050)	-	-	-	-
Dibromochloromethane	2.3	ND(0.050)	-	-	-	-
1,2-Dibromoethane	0.05	ND(0.050)	-	-	-	-
1,2-Dichlorobenzene	1.2	ND(0.050)	-	-	-	-
1,3-Dichlorobenzene	4.8	ND(0.050)	-	-	-	-
1,4-Dichlorobenzene	0.083	ND(0.050)	-	-	-	-
Dichlorodifluoromethane	16	ND(0.050)	-	-	-	-
1,1-Dichloroethane	0.47	ND(0.050)	-	-	-	-
1,2-Dichloroethane	0.05	ND(0.050)	-	-	-	-
1,1-Dichloroethylene	0.05	ND(0.050)	-	-	-	-
cis-1,2-Dichloroethylene	1.9	ND(0.050)	-	-	-	-
trans-1,2-Dichloroethylene	0.084	ND(0.050)	-	-	-	-
Methylene Chloride	0.1	ND(0.050)	-	-	-	-
1,2-Dichloropropane	0.05	ND(0.050)	-	-	-	-
cis-1,3-Dichloropropene	-	ND(0.030)	-	-	-	-
trans-1,3-Dichloropropene	-	ND(0.030)	-	-	-	-
1,3-Dichloropropene (cis & trans)	0.05	ND(0.042)	-	-	-	-
Ethylbenzene	1.1	ND(0.018)	-	-	-	-
n-Hexane	2.8	ND(0.050)	-	-	-	-
Methyl ethyl ketone (MEK)	16	ND(0.50)	-	-	-	-
Methyl isobutyl ketone (MIBK)	1.7	ND(0.50)	-	-	-	-
Methyl tert butyl ether (MTBE)	0.75	ND(0.050)	-	-	-	-
Styrene	0.7	ND(0.050)	-	-	-	-
1,1,1,2-Tetrachloroethane	0.058	ND(0.050)	-	-	-	-
1,1,2,2-Tetrachloroethane	0.05	ND(0.050)	-	-	-	-
Tetrachloroethylene	0.28	ND(0.050)	-	-	-	-
Toluene	2.3	ND(0.080)	-	-	-	-
1,1,1-Trichloroethane	0.38	ND(0.050)	-	-	-	-
1,1,2-Trichloroethane	0.05	ND(0.050)	-	-	-	-
Trichloroethylene	0.061	ND(0.010)	-	-	-	-
Trichlorofluoromethane	4	ND(0.050)	-	-	-	-
Vinyl chloride	0.02	ND(0.020)	-	-	-	-
o-Xylene	-	ND(0.020)	-	-	-	-
m+p-Xylenes	-	ND(0.030)	-	-	-	-
Xylenes (Total)	3.1	ND(0.050)	-	-	-	-
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	7.9	ND(0.050)	-	-	-	-
Acenaphthylene	0.15	ND(0.050)	-	-	-	-
Anthracene	0.67	ND(0.050)	-	-	-	-
Benzo(a)anthracene	0.5	ND(0.050)	-	-	-	-
Benzo(a)pyrene	0.3	ND(0.050)	-	-	-	-
Benzo(b)fluoranthene	0.78	ND(0.050)	-	-	-	-
Benzo(g,h,i)perylene	6.6	ND(0.050)	-	-	-	-
Benzo(k)fluoranthene	0.78	ND(0.050)	-	-	-	-
Chrysene	7	ND(0.050)	-	-	-	-

**Summary of Maximum Soil Concentration Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Parameters	MECP Table 2 Standards <sup>(1)</sup>	Maximum Concentration	Sample Location	Sample ID	Sample Date	Sample Interval (mBGS)
<b>PAHs (continued)</b>						
Dibenzo(ah)anthracene	0.1	ND(0.050)	-	-	-	-
Fluoranthene	0.69	ND(0.050)	-	-	-	-
Fluorene	62	ND(0.050)	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.38	ND(0.050)	-	-	-	-
1+2-Methylnaphthalenes	0.99	ND(0.042)	-	-	-	-
1-Methylnaphthalene	0.99	ND(0.030)	-	-	-	-
2-Methylnaphthalene	0.99	ND(0.030)	-	-	-	-
Naphthalene	0.6	ND(0.013)	-	-	-	-
Phenanthrene	6.2	ND(0.046)	-	-	-	-
Pyrene	78	ND(0.050)	-	-	-	-
<b>Petroleum Hydrocarbons (PHCs)</b>						
PHC F1 (C6-C10)	55	ND(5.0)	-	-	-	-
PHC F2 (C10-C16)	98	ND(10)	-	-	-	-
PHC F3 (C16-C34)	300	88	MW1-19	S-11196246-280619-MW1S	28-Jun-19	0.30 - 0.91
PHC F4 (C34-C50)	2,800	310	MW1-19	S-11196246-280619-MW1S	28-Jun-19	0.30 - 0.91
<b>Metals</b>						
Antimony	7.5	1.5	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Arsenic	18	3.0	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Barium	390	27.5	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Beryllium	4	ND(0.50)	-	-	-	-
Boron (Hot Water Soluble)	1.5	0.23	MW2-19	S-11196246-280619-MW2S-99	28-Jun-19	0.30 - 0.91
Boron	120	6.9	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Cadmium	1.2	ND(0.50)	-	-	-	-
Chromium	160	14.8	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Chromium VI	8	0.37	-	-	-	-
Cobalt	22	4.8	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Copper	140	10.3	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Lead	120	10.0	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Mercury	0.27	0.0151	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Molybdenum	6.9	1.4	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Nickel	100	8.0	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Selenium	2.4	ND(1.0)	-	-	-	-
Silver	20	ND(0.20)	-	-	-	-
Thallium	1	ND(0.50)	-	-	-	-
Uranium	23	ND(1.0)	-	-	-	-
Vanadium	86	28.6	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
Zinc	340	54.1	BH3-19	S-11196246-270619-BH3S	27-Jun-19	0.30 - 0.91
<b>General Chemistry</b>						
pH (s.u.)	-	7.87	MW2-19	S-11196246-280619-MW2D	28-Jun-19	2.13 - 2.74

## Notes:

All values are expressed in units of micrograms per gram (µg/g) unless noted otherwise

(1) "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011. Table 2: Full depth Generic Site Condition Standards in a Potable Ground Water Condition, Residential/Parkland/Institutional Property Use, for coarse-textured soils (MECP Table 2 Standards)

ND(0.50) Parameter not detected at method detection limit stated in parenthesis

mBGS Metres below ground surface



Table 6

**Summary of Groundwater Analytical Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Sample Location:	MW1-19	MW3-19	MW3-19	MW4-19	MW4-19	MW6-19
Sample ID:	GW-11196246-070819-SO-MW1-19	GW-11196246-070819-SO-MW3-19	GW-11196246-070819-SO-MW100	GW-11196246-071119-SO-MW4-19	GW-11196246-071519-SO-MW4-19	GW-11196246-091319-TB-MW6-19
Sample Date:	8-Jul-19	8-Jul-19	8-Jul-19	11-Jul-19	15-Jul-19	13-Sep-19
Screened Interval (mBGS):	3.05 - 6.10	4.57 - 7.62	4.57 - 7.62 Field Duplicate	3.05 - 6.10	3.05 - 6.10	6.10 - 9.14

**MECP Table 2  
Standards<sup>(1)</sup>**

## Parameters

**Volatile Organic Compounds (VOCs)**

Parameters	MECP Table 2 Standards <sup>(1)</sup>	MW1-19	MW3-19	MW3-19	MW4-19	MW4-19	MW6-19
Acetone	2,700	ND(30)	ND(30)	ND(30)	ND(30)	-	ND(30)
Benzene	5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Bromodichloromethane	16	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	-	ND(2.0)
Bromoform	25	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	-	ND(5.0)
Bromomethane	0.89	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Carbon tetrachloride	0.79	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	-	ND(0.20)
Chlorobenzene	30	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Dibromochloromethane	25	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	-	ND(2.0)
Chloroform	2.4	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	-	ND(1.0)
1,2-Dibromoethane	0.2	ND(0.20)	ND(0.20)	ND(0.20)	ND(0.20)	-	ND(0.20)
1,2-Dichlorobenzene	3	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,3-Dichlorobenzene	59	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,4-Dichlorobenzene	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Dichlorodifluoromethane	590	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	-	ND(2.0)
1,1-Dichloroethane	5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,2-Dichloroethane	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,1-Dichloroethylene	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
cis-1,2-Dichloroethylene	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
trans-1,2-Dichloroethylene	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Methylene Chloride	50	ND(5.0)	ND(5.0)	ND(5.0)	ND(5.0)	-	ND(5.0)
1,2-Dichloropropane	5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
cis-1,3-Dichloropropene	-	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	-	ND(0.30)
trans-1,3-Dichloropropene	-	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	-	ND(0.30)
1,3-Dichloropropene (cis & trans)	0.5	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Ethylbenzene	2.4	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
n-Hexane	51	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Methyl ethyl ketone (MEK)	1,800	ND(20)	ND(20)	ND(20)	ND(20)	-	ND(20)
Methyl isobutyl ketone (MIBK)	640	ND(20)	ND(20)	ND(20)	ND(20)	-	ND(20)
Methyl tert butyl ether (MTBE)	15	ND(2.0)	ND(2.0)	ND(2.0)	ND(2.0)	-	ND(2.0)
Styrene	5.4	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,1,1,2-Tetrachloroethane	1.1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,1,2,2-Tetrachloroethane	1	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Tetrachloroethylene	1.6	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Toluene	24	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,1,1-Trichloroethane	200	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
1,1,2-Trichloroethane	4.7	ND(0.50)	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)

Table 6

**Summary of Groundwater Analytical Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Sample Location:	MW1-19	MW3-19	MW3-19	MW4-19	MW4-19	MW6-19
Sample ID:	GW-11196246-070819-SO-MW1-19	GW-11196246-070819-SO-MW3-19	GW-11196246-070819-SO-MW100	GW-11196246-071119-SO-MW4-19	GW-11196246-071519-SO-MW4-19	GW-11196246-091319-TB-MW6-19
Sample Date:	8-Jul-19	8-Jul-19	8-Jul-19	11-Jul-19	15-Jul-19	13-Sep-19
Screened Interval (mBGS):	3.05 - 6.10	4.57 - 7.62	4.57 - 7.62 Field Duplicate	3.05 - 6.10	3.05 - 6.10	6.10 - 9.14
Parameters	MECP Table 2 Standards <sup>(1)</sup>					
<b>VOCs (cont'd)</b>						
Trichloroethylene	1.6	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
Trichlorofluoromethane	150	ND(5.0)	ND(5.0)	ND(5.0)	-	ND(5.0)
Vinyl chloride	0.5	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
o-Xylene	-	ND(0.30)	ND(0.30)	ND(0.30)	-	ND(0.30)
m+p-Xylenes	-	ND(0.40)	ND(0.40)	ND(0.40)	-	ND(0.40)
Xylenes (Total)	300	ND(0.50)	ND(0.50)	ND(0.50)	-	ND(0.50)
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	4.1	-	-	ND(0.020)	-	ND(0.020)
Acenaphthylene	1	-	-	ND(0.020)	-	ND(0.020)
Anthracene	2.4	-	-	ND(0.020)	-	ND(0.020)
Benzo(a)anthracene	1	-	-	ND(0.020)	-	ND(0.020)
Benzo(a)pyrene	0.01	-	-	ND(0.010)	-	ND(0.010)
Benzo(b)fluoranthene	0.1	-	-	ND(0.020)	-	ND(0.020)
Benzo(g,h,i)perylene	0.2	-	-	ND(0.020)	-	ND(0.020)
Benzo(k)fluoranthene	0.1	-	-	ND(0.020)	-	ND(0.020)
Chrysene	0.1	-	-	0.02	-	ND(0.020)
Dibenzo(ah)anthracene	0.2	-	-	ND(0.020)	-	ND(0.020)
Fluoranthene	0.41	-	-	0.038	-	ND(0.020)
Fluorene	120	-	-	ND(0.020)	-	ND(0.020)
Indeno(1,2,3-cd)pyrene	0.2	-	-	ND(0.020)	-	ND(0.020)
1+2-Methylnaphthalenes	3.2	-	-	ND(0.028)	-	ND(0.028)
1-Methylnaphthalene	3.2	-	-	ND(0.020)	-	ND(0.020)
2-Methylnaphthalene	3.2	-	-	ND(0.020)	-	ND(0.020)
Naphthalene	11	-	-	ND(0.050)	-	ND(0.050)
Phenanthrene	1	-	-	0.059	-	ND(0.020)
Pyrene	4.1	-	-	0.039	-	ND(0.020)
<b>Metals</b>						
Antimony	6	ND(0.10)	ND(1.0)	ND(1.0)	-	2.1 ND(1.0)
Arsenic	25	0.13	ND(1.0)	ND(1.0)	-	ND(1.0)
Barium	1,000	51.8	129	131	-	246 134
Beryllium	4	ND(0.10)	ND(1.0)	ND(1.0)	-	ND(1.0)
Boron	5,000	26	ND(100)	ND(100)	-	ND(100)
Cadmium	2.7	ND(0.010)	ND(0.050)	ND(0.050)	-	ND(0.050)
Chromium	50	1.26	ND(5.0)	ND(5.0)	-	ND(5.0)

Table 6

**Summary of Groundwater Analytical Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Parameters	Sample Location:	MW1-19	MW3-19	MW3-19	MW4-19	MW4-19	MW6-19
	Sample ID:	GW-11196246-070819-SO-MW1-19	GW-11196246-070819-SO-MW3-19	GW-11196246-070819-SO-MW100	GW-11196246-071119-SO-MW4-19	GW-11196246-071519-SO-MW4-19	GW-11196246-091319-TB-MW6-19
	Sample Date:	8-Jul-19	8-Jul-19	8-Jul-19	11-Jul-19	15-Jul-19	13-Sep-19
	Screened Interval (mBGS):	3.05 - 6.10	4.57 - 7.62	4.57 - 7.62 Field Duplicate	3.05 - 6.10	3.05 - 6.10	6.10 - 9.14
	MECP Table 2 Standards <sup>(1)</sup>						
<b>Metals (cont'd)</b>							
Chromium VI	25	ND(0.50)	1.68	1.63	-	ND(0.50)	2.14
Cobalt	3.8	ND(0.10)	ND(1.0)	ND(1.0)	-	ND(1.0)	ND(1.0)
Copper	87	0.57	ND(2.0)	ND(2.0)	-	2.3	ND(2.0)
Lead	10	ND(0.050)	ND(0.50)	ND(0.50)	-	ND(0.50)	ND(0.50)
Mercury	0.29	ND(0.010)	ND(0.010)	ND(0.010)	-	0.025J	ND(0.0050)
Molybdenum	70	0.186	ND(0.50)	ND(0.50)	-	6	ND(0.50)
Nickel	100	ND(0.50)	ND(5.0)	ND(5.0)	-	ND(5.0)	ND(5.0)
Selenium	10	1.93	ND(0.50)	ND(0.50)	-	1.9	1.21
Silver	1.5	ND(0.050)	ND(0.50)	ND(0.50)	-	ND(0.50)	ND(0.50)
Sodium	490,000	157,000	<b>787,000</b>	<b>807,000</b>	-	<b>604,000</b>	<b>764,000</b>
Thallium	2	ND(0.010)	ND(0.10)	ND(0.10)	-	ND(0.10)	ND(0.10)
Uranium	20	0.274	0.59	0.59	-	3.14	0.5
Vanadium	6.2	ND(0.50)	ND(5.0)	ND(5.0)	-	ND(5.0)	ND(5.0)
Zinc	1,100	1.1	ND(10)	ND(10)	-	15	ND(10)
<b>Petroleum Hydrocarbons (PHCs)</b>							
PHC F1 (C6-C10)	750	ND(25)	ND(25)	ND(25)	ND(25)	-	ND(25)
PHC F2 (C10-C16)	150	ND(100)	ND(100)	ND(100)	ND(100)	-	ND(100)
PHC F3 (C16-C34)	500	ND(250)	ND(250)	ND(250)	ND(250)	-	ND(250)
PHC F4 (C34-C50)	500	ND(250)	ND(250)	ND(250)	ND(250)	-	ND(250)

## Notes:

All values are expressed in units of micrograms per litre (µg/L) unless noted otherwise

- (1) "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.  
Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition, All Types of Property Use, for coarse-textured soils (MECP Table 2 Standards)

mBGS Metres below ground surface

ND(30) Parameter not detected at method detection limit stated in parenthesis

**787,000** Concentration exceeds MECP Table 2 Standard

J Estimated value

Table 7

**Summary of Maximum Groundwater Concentration Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Parameters	MECP Table 2 Standards <sup>(1)</sup>	Maximum Concentration	Sample Location	Sample ID	Sample Date	Screened Interval (mBGS)
<b>Volatile Organic Compounds (VOCs)</b>						
Acetone	2,700	ND(30)	-	-	-	-
Benzene	5	ND(0.50)	-	-	-	-
Bromodichloromethane	16	ND(2.0)	-	-	-	-
Bromoform	25	ND(5.0)	-	-	-	-
Bromomethane	0.89	ND(0.50)	-	-	-	-
Carbon tetrachloride	0.79	ND(0.20)	-	-	-	-
Chlorobenzene	30	ND(0.50)	-	-	-	-
Dibromochloromethane	25	ND(2.0)	-	-	-	-
Chloroform	2.4	ND(1.0)	-	-	-	-
1,2-Dibromoethane	0.2	ND(0.20)	-	-	-	-
1,2-Dichlorobenzene	3	ND(0.50)	-	-	-	-
1,3-Dichlorobenzene	59	ND(0.50)	-	-	-	-
1,4-Dichlorobenzene	1	ND(0.50)	-	-	-	-
Dichlorodifluoromethane	590	ND(2.0)	-	-	-	-
1,1-Dichloroethane	5	ND(0.50)	-	-	-	-
1,2-Dichloroethane	1.6	ND(0.50)	-	-	-	-
1,1-Dichloroethylene	1.6	ND(0.50)	-	-	-	-
cis-1,2-Dichloroethylene	1.6	ND(0.50)	-	-	-	-
trans-1,2-Dichloroethylene	1.6	ND(0.50)	-	-	-	-
Methylene Chloride	50	ND(5.0)	-	-	-	-
1,2-Dichloropropane	5	ND(0.50)	-	-	-	-
cis-1,3-Dichloropropene	-	ND(0.30)	-	-	-	-
trans-1,3-Dichloropropene	-	ND(0.30)	-	-	-	-
1,3-Dichloropropene (cis & trans)	0.5	ND(0.50)	-	-	-	-
Ethylbenzene	2.4	ND(0.50)	-	-	-	-
n-Hexane	51	ND(0.50)	-	-	-	-
2-Butanone (Methyl ethyl ketone) (MEK)	1,800	ND(20)	-	-	-	-
Methyl isobutyl ketone (MIBK)	640	ND(20)	-	-	-	-
Methyl tert butyl ether (MTBE)	15	ND(2.0)	-	-	-	-
Styrene	5.4	ND(0.50)	-	-	-	-
1,1,1,2-Tetrachloroethane	1.1	ND(0.50)	-	-	-	-
1,1,2,2-Tetrachloroethane	1	ND(0.50)	-	-	-	-
Tetrachloroethylene	1.6	ND(0.50)	-	-	-	-
Toluene	24	ND(0.50)	-	-	-	-
1,1,1-Trichloroethane	200	ND(0.50)	-	-	-	-
1,1,2-Trichloroethane	4.7	ND(0.50)	-	-	-	-
Trichloroethylene	1.6	ND(0.50)	-	-	-	-
Trichlorofluoromethane	150	ND(5.0)	-	-	-	-
Vinyl chloride	0.5	ND(0.50)	-	-	-	-
o-Xylene	-	ND(0.30)	-	-	-	-
m+p-Xylenes	-	ND(0.40)	-	-	-	-
Xylenes (Total)	300	ND(0.50)	-	-	-	-
<b>Polycyclic Aromatic Hydrocarbons (PAHs)</b>						
Acenaphthene	4.1	ND(0.020)	-	-	-	-
Acenaphthylene	1	ND(0.020)	-	-	-	-
Anthracene	2.4	ND(0.020)	-	-	-	-
Benzo(a)anthracene	1	ND(0.020)	-	-	-	-
Benzo(a)pyrene	0.01	ND(0.010)	-	-	-	-
Benzo(b)fluoranthene	0.1	ND(0.020)	-	-	-	-
Benzo(g,h,i)perylene	0.2	ND(0.020)	-	-	-	-
Benzo(k)fluoranthene	0.1	ND(0.020)	-	-	-	-
Chrysene	0.1	0.02	MW4-19	GW-11196246-071119-SO-MW4-19	11-Jul-19	3.05 - 6.10
Dibenzo(ah)anthracene	0.2	ND(0.020)	-	-	-	-
Fluoranthene	0.41	0.038	MW4-19	GW-11196246-071119-SO-MW4-19	11-Jul-19	3.05 - 6.10
Fluorene	120	ND(0.020)	-	-	-	-
Indeno(1,2,3-cd)pyrene	0.2	ND(0.020)	-	-	-	-
1+2-Methylnaphthalenes	3.2	ND(0.028)	-	-	-	-
1-Methylnaphthalene	3.2	ND(0.020)	-	-	-	-
2-Methylnaphthalene	3.2	ND(0.020)	-	-	-	-
Naphthalene	11	ND(0.050)	-	-	-	-
Phenanthrene	1	0.059	MW4-19	GW-11196246-071119-SO-MW4-19	11-Jul-19	3.05 - 6.10
Pyrene	4.1	0.039	MW4-19	GW-11196246-071119-SO-MW4-19	11-Jul-19	3.05 - 6.10
<b>Metals</b>						
Antimony	6	2.1	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Arsenic	25	0.13	MW1-19	GW-11196246-070819-SO-MW1-19	8-Jul-19	3.05 - 6.10
Barium	1,000	246	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Beryllium	4	ND(1.0)	-	-	-	-
Boron	5,000	26	MW1-19	GW-11196246-070819-SO-MW1-19	8-Jul-19	3.05 - 6.10
Cadmium	2.7	ND(0.050)	-	-	-	-
Chromium	50	1.26	MW1-19	GW-11196246-070819-SO-MW1-19	8-Jul-19	3.05 - 6.10
Chromium VI	25	2.14	MW6-19	GW-11196246-091319-TB-MW6-19	13-Sep-19	6.10 - 9.14
Cobalt	3.8	ND(1.0)	-	-	-	-
Copper	87	2.3	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Lead	10	ND(0.50)	-	-	-	-
Mercury	0.29	0.025J	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Molybdenum	70	6	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Nickel	100	ND(5.0)	-	-	-	-
Selenium	10	1.93	MW1-19	GW-11196246-070819-SO-MW1-19	8-Jul-19	3.05 - 6.10
Silver	1.5	ND(0.50)	-	-	-	-
Sodium	490,000	<b>807,000</b>	MW3-19	GW-11196246-070819-SO-MW100	8-Jul-19	4.57 - 7.62
Thallium	2	ND(0.10)	-	-	-	-
Uranium	20	3.14	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10
Vanadium	6.2	ND(5.0)	-	-	-	-
Zinc	1,100	15	MW4-19	GW-11196246-071519-SO-MW4-19	15-Jul-19	3.05 - 6.10

Table 7

**Summary of Maximum Groundwater Concentration Data  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Parameters	MECP Table 2 Standards <sup>(1)</sup>	Maximum Concentration	Sample Location	Sample ID	Sample Date	Screened Interval (mBGS)
<b>Petroleum Hydrocarbons (PHCs)</b>						
PHC F1 (C6-C10)	25	ND(25)	-	-	-	-
PHC F2 (C10-C16)	100	ND(100)	-	-	-	-
PHC F3 (C16-C34)	250	ND(250)	-	-	-	-
PHC F4 (C34-C50)	250	ND(250)	-	-	-	-

## Notes:

All values are expressed in units of micrograms per litre (µg/L) unless noted otherwise

- (1) "Soil, Groundwater and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act", dated April 15, 2011.  
Table 2: Full Depth Generic Site Condition Standards in a Potable Ground Water Condition, All Types of Property Use, for coarse-textured soils (MECP Table 2 Standards)

mBGS Metres below ground surface

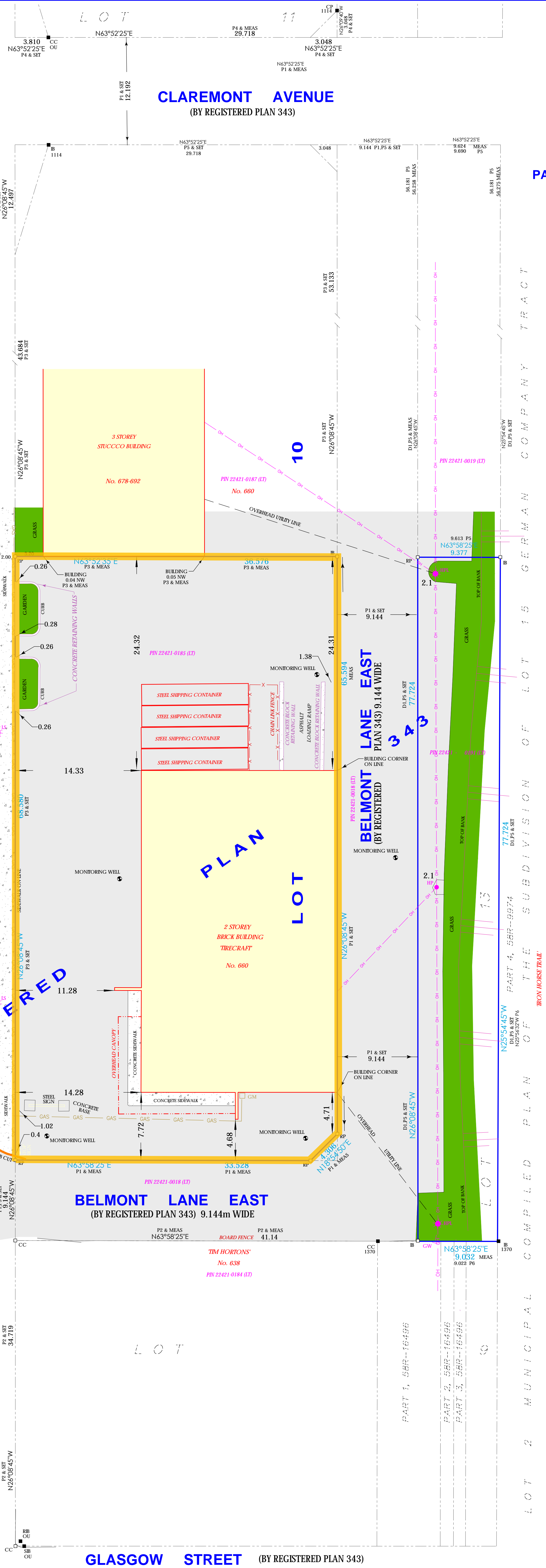
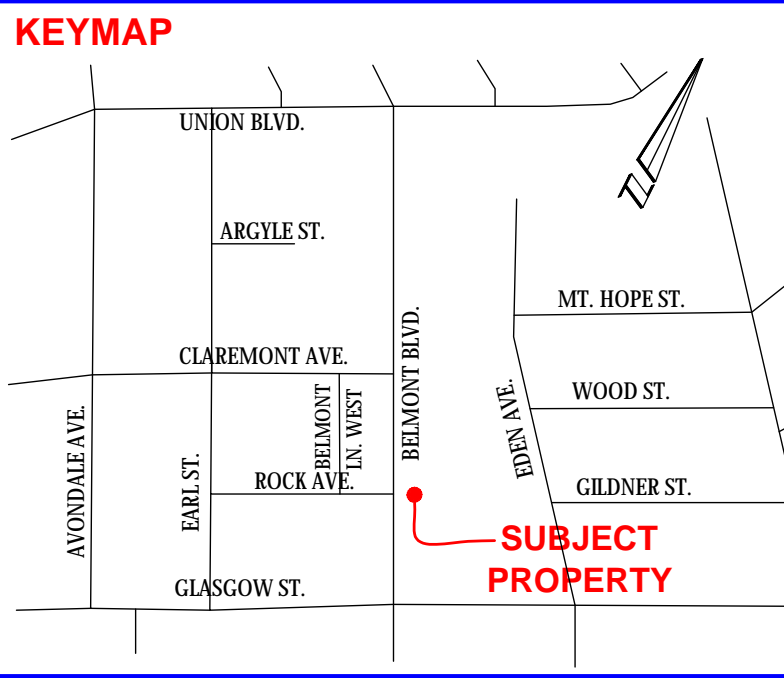
ND(30) Parameter not detected at method detection limit stated in parenthesis

**807,000** Concentration exceeds MECP Table 2 Standard

J Estimated value

# Appendices

# Appendix A Plan of Survey



**SUMMARY REPORT:**  
**CLIENT:**  
 THIS PLAN WAS PREPARED FOR 660 BELMONT CP INC. AND THE UNDERSIGNED ACCEPTS NO RESPONSIBILITY FOR USE BY OTHER PARTIES.  
**DESCRIPTION OF PROPERTY:**  
 ALL OF PIN 22421-0185 (LT) PART OF LOT 10, REGISTERED PLAN 343, AS IN INST. 934710 (FIRSTLY) ALL OF PIN 22421-0191 (LT) PART OF LOT 13, REGISTERED PLAN 343, AS IN INST. 934710 (SECONDLY) CITY OF KITCHENER, REGIONAL MUNICIPALITY OF WATERLOO ADDRESS: No. 660 BELMONT AVENUE WEST  
**COMMENTS:**  
 OVERHEAD HYDRO LINES CROSS OVER PIN 22421-0191  
**EASEMENTS:**  
 NONE FOUND AT REGISTRY OFFICE

**SURVEYOR'S REAL PROPERTY REPORT**  
**PLAN OF SURVEY**  
**PART OF LOTS 10 & 13, REGISTERED PLAN 343**  
**CITY OF KITCHENER**  
**REGIONAL MUNICIPALITY OF WATERLOO**

SCALE 1 : 200  
 0 2.5 5 7.5 10 metres  
 VAN HARTEN SURVEYING INC.

- LEGEND:**
- DENOTES SURVEY MONUMENT SET
  - DENOTES SURVEY MONUMENT FOUND
  - SIB DENOTES .025 x .025 x 1.20 STANDARD IRON BAR
  - IB DENOTES .015 x .015 x 0.60 IRON BAR
  - IP IRON PIPE
  - RP ROCK POST
  - CC CUT CROSS
  - RIB ROUND IRON BAR
  - CP CONCRETE PIN
  - OU ORIGIN UNKNOWN
  - WIT WITNESS MONUMENT
  - P1 DENOTES REGISTERED PLAN 343
  - P2 DENOTES PLAN 588-16496 BY 1370
  - P3 DENOTES SURVEY BY METZ & LORENTZ, SEPT. 26, 2005 (K3-349-21)
  - P4 DENOTES PLAN 588-1801 BY ACT
  - P5 DENOTES SURVEY BY METZ & LORENTZ, FEB. 5/1970 (K1-349-7.10)
  - P6 DENOTES PLAN 588-9974 BY 994
  - D1 DENOTES INST. 934710 (DESCRIPTIVE DEED PINS 22421-0185 & 0191)
  - VH DENOTES VAN HARTEN SURVEYING INC. O.L.S.'s
  - 994 DENOTES WAYNE D. BRUBACHER O.L.S.
  - 1114 DENOTES METZ AND LORENTZ LTD. O.L.S.'s
  - 1370 DENOTES VLADIMIR KRCMAR O.L.S.

- SYMBOLS**
- OH OVERHEAD HYDRO
  - x—x— FENCELINE
  - GW GUY WIRE
  - LS LIGHT STANDARD
  - PL HYDRO POLE WITH LIGHT
  - OH SIGN
  - GM GAS METER
  - GM GM
  - BUILDING BUILDING
  - CONCRETE CONCRETE
  - ASPHALT ASPHALT

- NOTES:**
- BEARINGS ARE GRID BEARINGS AND ARE DERIVED FROM GPS OBSERVATIONS AND ARE REFERRED TO THE UTM PROJECTION, ZONE 17, NAD 83-CSRS (2010) ADJUSTMENT.
  - DISTANCES SHOWN ON THE PLAN ARE ADJUSTED GROUND DISTANCES AND CAN BE CONVERTED TO UTM GRID DISTANCES BY MULTIPLYING BY AN AVERAGED COMBINED SCALE FACTOR OF 0.99957234.

**BEARING COMPARISONS:**  
 FOR THE PURPOSES OF BEARING COMPARISONS, PREVIOUS SURVEYS HAVE BEEN ROTATED TO UTM BEARINGS BY THE ANGLES SHOWN BELOW.

PLAN	ROTATION FOR NORTHEAST BEARINGS
P1	-0°13'35"
P2, P6	-0°01'45"
P3, P4, P5	-0°20'45"

PHASE ONE ENVIRONMENTAL SITE ASSESSMENT (ESA)  
 PHASE TWO ESA, AND RECORD OF SITE CONDITION  
 PROPERTY

**METRIC:**  
 DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

**SURVEYOR'S CERTIFICATE**

I CERTIFY THAT:  
 1. THIS SURVEY AND PLAN ARE CORRECT AND IN ACCORDANCE WITH THE SURVEYS ACT, THE SURVEYORS ACT, THE LAND TITLES ACT AND THE REGULATIONS MADE UNDER THEM.  
 2. THIS SURVEY WAS COMPLETED ON THE 10TH DAY OF DECEMBER, 2019.

DATE: JANUARY 15, 2020  
 JAMES M. LAWS  
 ONTARIO LAND SURVEYOR

ASSOCIATION OF ONTARIO LAND SURVEYORS  
 LAND SURVEYORS PLAN SUBMISSION FORM  
 2107463

THIS PLAN IS NOT VALID UNLESS IT IS AN EMBOSSED ORIGINAL COPY ISSUED BY THE SURVEYOR  
 In accordance with Regulation 1028, Section 29(3).  
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**Van Harten**  
 SURVEYING INC.  
 LAND SURVEYORS AND ENGINEERS

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www.vanharten.com		info@vanharten.com
DRAWN BY: DDD	CHECKED BY: JML	PROJECT No. 27803-19
Jan 23, 2020 9:55:17 AM G:\KITCHENER\343-660 BELMONT\ACAD\SRPP PL 343 (660 BELMONT) UTM 2010.dwg		



# Appendix B

## Sampling and Analysis Plan

**Proposed Sampling and Analysis Plan  
Phase Two Environmental Site Assessment  
Western Parcel of 660 Belmont Avenue West  
Kitchener, Ontario**

Investigative Location	Proposed Depth		Proposed Screen Interval		Rationale	Soil Samples						Groundwater Samples				
	mBGS	fBGS	mBGS	fBGS		Soil Sample Depth		Parameters				Parameters				
						mBGS	fBGS	Metals	PAHs	PHCs	VOCs	Metals	PAHs	PHCs	VOCs	
BH3-19	6.1	20.0	-	-	-	-	0.3 - 0.9	1.0 - 3.0	X	X	X	X	-	-	-	-
			-	-	-	-	2.1 - 2.7	7.0 - 9.0	-	-	-	-	-	-	-	-
BH4-19	6.1	20.0	-	-	-	-	0.3 - 0.9	1.0 - 3.0	-	X	X	-	-	-	-	-
			-	-	-	-	2.1 - 2.7	7.0 - 9.0	-	-	-	-	-	-	-	-
MW1-19	6.1	20.0	3.1 - 6.1	10.0 - 20.0	Investigate soil and groundwater quality in the area of the garage	0.3 - 0.9	1.0 - 3.0	X	X	X	X	X	X	X	X	
			-	-		2.1 - 2.7	7.0 - 9.0	-	-	-	-	-	-	-	-	
MW2-19	6.1	20.0	3.1 - 6.1	10.0 - 20.0	Investigate soil and groundwater quality in the area of the garage	0.3 - 0.9	1.0 - 3.0	X	X	X	X	X	X	X	X	
			-	-		2.1 - 2.7	7.0 - 9.0	-	-	-	-	-	-	-	-	
MW3-19	6.1	20.0	3.1 - 6.1	10.0 - 20.0	Investigate groundwater quality associated with the gasoline service stations located at 200 Glasgow Street and 638 Belmont Avenue West	-	-	-	-	-	-	X	X	X	X	
MW4-19	6.1	10.0	3.1 - 6.1	10.0 - 20.0	Investigate groundwater quality associated with historical gasoline service station at 638 Belmont Avenue West	-	-	-	-	-	-	X	X	X	X	
MW6-19	9.0	30.0	6.0 - 9.0	20.0 - 30.0	Replaced MW2-19 (dry) to investigate groundwater quality in the area of the garage.	-	-	-	-	-	-	X	X	X	X	

## Notes:

PAHs Polycyclic aromatic hydrocarbons  
 PHCs Petroleum hydrocarbon fractions F1 to F4  
 VOCs Volatile organic compounds  
 ASTs Aboveground storage tanks

- Addresses
- Schools
- Libraries
- Airport
- Towns and Villages
- Assessment Parcels
- Municipal Boundaries



- Notes:**
- APEC #1 - Current and Historical Gasoline Service Stations (off-Site)
  - APEC #2 - Maintenance Shop
  - APEC #3 - Used Oil ASTs
  - APEC #4 - Motor Oil ASTs

1: 1,128



57.3      0      28.65      57.3 Meters

**Notes**

This map was automatically generated using Geocortex Essentials.

# Appendix C

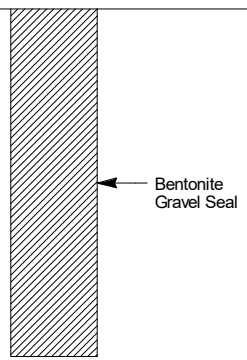
## Stratigraphic and Instrumentation Logs



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: BH3-19  
 DATE COMPLETED: 27 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/Pionjar  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	GROUND SURFACE	333.04						
1	CONCRETE  SW - SAND, with gravel, very loose, medium grained, well graded, light brown, dry  - Loose to compact starting at 1.22m BGS	332.88	 <p style="text-align: center;">Bentonite Gravel Seal</p>	BH-05		50		40.5
						75		34.3
						100		39.0
2	SP - SAND, trace gravel, loose to compact, fine to medium grained, poorly graded, dark brown, dry  SW - SAND, with gravel, loose, medium grained, well graded, light brown to grey, dry	331.36 331.21				75		38.5
						50		42.2
3	END OF BOREHOLE @ 2.77m BGS  Refusal @ 2.77m BGS	330.27						
4								
5								
6								
7								
8								
9								
10								

**WELL DETAILS**  
 Seal:  
 333.04 to 330.27m m AMSL  
 0.00 to 2.77m BGS  
 Material: Bentonite Gravel Seal

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○

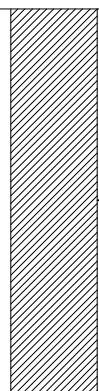
OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: BH4-19  
 DATE COMPLETED: 27 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/Pionjar  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	BOREHOLE	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	GROUND SURFACE	333.04						
1	CONCRETE  SW - GRAVELLY SAND, loose, medium grained, well graded, light brown to grey, dry	332.88	 <p style="text-align: right; margin-right: 20px;">← Bentonite Gravel Seal</p>	BH4S		75		40.2
						92		66.7
2	SP - SAND, with gravel, trace silt and clay, loose, fine grained, poorly graded, light brown, dry - Dark brown starting at 2.29m BGS	331.21				100		61.4
	- Fine sand starting at 2.90m BGS					100		51.7
3	END OF BOREHOLE @ 3.05m BGS	329.99				92		55.0
4			<u>WELL DETAILS</u> Seal: 333.04 to 329.99m m AMSL 0.00 to 3.05m BGS Material: Bentonite Gravel Seal					
5								
6								
7								
8								
9								
10								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS ○

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW1-19  
 DATE COMPLETED: 28 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/108-mm ID HSA  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	TOP OF CASING GROUND SURFACE TOP OF RISER	331.70 331.68 331.54						
1	ASPHALT  SW - GRAVELLY SAND, very loose, medium grained, well graded, grey, moist	331.53	<p style="font-size: small;">Concrete Bentonite Gravel Seal 51-mm Ø PVC Riser Sand Pack 51-mm Ø PVC Screen</p>	MWS	P/S	30		12.6
	SP - SAND, no to trace silt, loose, fine to medium grained, poorly graded, brown, dry to moist	330.46						
2	SM - SAND and SILT, loose, fine grained, poorly graded, dark brown, moist - Gravelly starting at 1.65m BGS	330.16 329.85			P/S			10.4
3	SW - SAND and GRAVEL, loose to compact, medium to coarse grained, well graded, brown, moist	328.94						
4	SP - SAND, loose, fine to medium grained, poorly graded, light brown to grey, moist  - 0.08-m silt seam starting at 3.56m BGS				P/S			15.8
5	SW - SAND, with gravel, loose to compact, medium grained, well graded, brown, moist to wet	326.80 326.50			P/S			10.6
6	SP - SAND, loose, coarse grained, poorly graded, grey, wet SM - SAND and SILT, compact, fine grained, poorly graded, light brown, wet	325.99 325.59						
7	END OF BOREHOLE @ 6.10m BGS							
8								
9								
10								

**WELL DETAILS**  
 Screened interval:  
 328.63 to 325.59m AMSL  
 3.05 to 6.10m BGS  
 Length: 3.05m  
 Diameter: 51mm  
 Slot Size: 10  
 Material: Sch. 40 PVC  
 Seal:  
 331.07 to 329.24m AMSL  
 0.61 to 2.44m BGS  
 Material: Bentonite Gravel Seal  
 Sand Pack:  
 329.24 to 325.59m AMSL  
 2.44 to 6.10m BGS  
 Material: No. 10 Silica Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS  

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW2-19  
 DATE COMPLETED: 28 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/108-mm ID HSA  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	TOP OF CASING GROUND SURFACE TOP OF RISER	332.98 332.97 332.83						
1	ASPHALT  SW - GRAVELLY SAND, loose, medium grained, well graded, light brown to brown	332.81	<p style="font-size: small; margin-top: 10px;"><b>WELL DETAILS</b>            Screened interval:            329.92 to 326.87m AMSL            3.05 to 6.10m BGS            Length: 3.05m            Diameter: 51mm            Slot Size: 10            Material: Sch. 40 PVC            Seal:            332.36 to 329.92m AMSL            0.61 to 3.05m BGS            Material: Bentonite Gravel Seal            Sand Pack:            330.53 to 326.87m AMSL            2.44 to 6.10m BGS            Material: No. 10 Silica Sand</p>					
	SM - SAND, with silt, trace clay, loose, fine grained, poorly graded, brown, moist	332.20		P/S	60		6.9	
2	SW - GRAVELLY SAND, loose, fine to coarse grained, well graded, dark to rusty brown, moist - Light brown to grey starting at 2.23m BGS	331.04		P/S			15.6	
3	SP - SAND, loose to compact, fine grained, poorly graded, light brown, moist - 0.08-m silt seam starting at 2.90m BGS	330.38		P/S				
4				P/S			8.6	
5	- 0.15-m gravelly sand seam starting at 4.72m BGS			P/S				
6	SW - GRAVELLY SAND, loose, coarse to medium grained, light brown to grey, wet	327.53				6.5		
	END OF BOREHOLE @ 6.10m BGS	326.87						

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

CHEMICAL ANALYSIS  

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW3-19  
 DATE COMPLETED: 27 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/108-mm ID HSA  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	PID
	GROUND SURFACE TOP OF CASING TOP OF RISER	332.40 332.39 332.29					
1	ASPHALT  SW - GRAVELLY SAND, loose, medium grained, well graded, dry  SP - SAND, trace silt and clay, loose to compact, fine to medium grained, poorly graded, brown to grey, moist to dry	332.25  331.43	<p style="font-size: small;"> <b>WELL DETAILS</b>            Screened interval:            327.83 to 324.78m AMSL            4.57 to 7.62m BGS            Length: 3.05m            Diameter: 51mm            Slot Size: 10            Material: Sch. 40 PVC            Seal:            331.79 to 329.35m AMSL            0.61 to 3.05m BGS            Material: Bentonite Gravel Seal            Sand Pack:            328.44 to 324.78m AMSL            3.96 to 7.62m BGS            Material: No. 10 Silica Sand         </p>				
2	- Sand with silt starting at 3.05m BGS						
3	- 0.15-m gravel seam starting at 3.81m BGS						
4	- Silt and clay seam, high plasticity starting at 4.17m BGS						
5	- Wet starting at 4.25m BGS						
6	- Medium grained starting at 4.57m BGS						
7	- Gravel seam for 0.30 m starting at 4.88m BGS						
8	- Silt starting at 6.10m BGS						
9	END OF BOREHOLE @ 7.62m BGS	324.78					
10							

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW4-19  
 DATE COMPLETED: 27 June 2019  
 DRILLING METHOD: 51-mm OD Macro-Core/108-mm ID HSA  
 FIELD PERSONNEL: H. MacEachern

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	TOP OF CASING GROUND SURFACE TOP OF RISER	331.92 331.90 331.74						
1	ASPHALT  SP - SAND, trace clay and gravel, loose, fine to medium grained, poorly graded, dark to light brown, dry; some brown mottling  - With clay starting at 1.37m BGS  - Rust-brown starting at 1.83m BGS	331.75	<p><b>WELL DETAILS</b>            Screened interval:            328.85 to 325.81m AMSL            3.05 to 6.10m BGS            Length: 3.05m            Diameter: 51mm            Slot Size: 10            Material: Sch. 40 PVC            Seal:            331.29 to 329.46m AMSL            0.61 to 2.44m BGS            Material: Bentonite Gravel Seal            Sand Pack:            329.46 to 325.81m AMSL            2.44 to 6.10m BGS            Material: No. 10 Silica Sand</p>	P/S	60		31.0	
2	SW - GRAVELLY SAND, loose, medium to coarse grained, well graded, brown to grey, moist	329.77		P/S	97		33.5	
3				P/S	97		39.2	
4	SP - SAND, loose, fine to coarse grained, poorly graded, grey to brown, dry to moist  - 0.30-m coarse sand and gravel for starting at 4.78m BGS	327.79		P/S	100		48.4	
5								
6	CL - CLAY, trace sand, very stiff, high plasticity, poorly graded, brown, wet  END OF BOREHOLE @ 6.10m BGS	326.11 325.81						
7								
8								
9								
10								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW6-19  
 DATE COMPLETED: 12 September 2019  
 DRILLING METHOD: 51-mm OD Split-Spoon/108-mm ID HSA  
 FIELD PERSONNEL: T. Brindle

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
	GROUND SURFACE TOP OF CASING TOP OF RISER	333.02 333.02 332.91						
1	See stratigraphy from MW2-19. MW2-19 was decommissioned and replaced by MW6-19 through same borehole.		<p style="font-size: small;">Concrete Bentonite Gravel Seal 51-mm Ø PVC Riser  Sand Pack 51-mm Ø PVC Screen</p>					
2								
3								
4								
5								
6	ML - SANDY SILT, stiff, low to medium plasticity, brown, moist to wet  - Trace clay, grey, wet starting at 6.86m BGS	326.93			70		2.3	
7					60		51.0	
8					50		0.9	
9	SP - SAND, compact, fine grained, poorly graded, brown-grey, wet	324.33			75		51.1	
10	END OF BOREHOLE @ 9.14m BGS	323.88	<p style="font-size: x-small;"><b>WELL DETAILS</b>            Screened interval:            326.93 to 323.88m m AMSL            6.10 to 9.14m BGS            Length: 3.05m            Diameter: 51mm            Slot Size: 10            Material: Sch. 40 PVC            Seal:</p>					

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: Phase Two Environmental Site Assessment  
 PROJECT NUMBER: 11196246-01  
 CLIENT: 660 Belmont GP Inc.  
 LOCATION: 660 Belmont Avenue West, Kitchener, Ontario

HOLE DESIGNATION: MW6-19  
 DATE COMPLETED: 12 September 2019  
 DRILLING METHOD: 51-mm OD Split-Spoon/108-mm ID HSA  
 FIELD PERSONNEL: T. Brindle

DEPTH m BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. m AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)		PID
12			332.87 to 327.53m m AMSL 0.15 to 5.49m BGS Material: Bentonite Gravel Seal Sand Pack: 327.53 to 323.88m m AMSL 5.49 to 9.14m BGS Material: No. 10 Silica Sand					
13								
14								
15								
16								
17								
18								
19								
20								
21								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 11196246-SIL-SO-2020-03-20.GPJ\_GHD\_Corp 20/3/20

# Appendix D

## Analytical Data Reports



GHD Limited (Waterloo)  
ATTN: Pascal Renella  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Date Received: 04-JUL-19  
Report Date: 15-OCT-19 14:39 (MT)  
Version: FINAL REV. 4

Client Phone: 450-973-4165

## Certificate of Analysis

Lab Work Order #: L2303880  
Project P.O. #: 73516171  
Job Reference: 11196246  
C of C Numbers:  
Legal Site Desc:

Comments: ADDITIONAL 12-JUL-19 07:40

12-JUL-2019 Sample 3 amended as per COFC  
15-OCT-2019 Table 2 - RPI - Coarse  
Sample ID amendments as per correspondence

Rick Hawthorne  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
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# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-1	S-11196246-270619-BH3S									
Sampled By: CLIENT on 27-JUN-19 @ 10:30										
Matrix: SOIL										
<b>Physical Tests</b>										
% Moisture		16.4		0.10	%	05-JUL-19				
<b>Metals</b>										
Antimony (Sb)		1.5		1.0	ug/g	10-JUL-19	7.5			
Arsenic (As)		3.0		1.0	ug/g	10-JUL-19	18			
Barium (Ba)		27.5		1.0	ug/g	10-JUL-19	390			
Beryllium (Be)		<0.50		0.50	ug/g	10-JUL-19	4			
Boron (B)		6.9		5.0	ug/g	10-JUL-19	120			
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	10-JUL-19	1.5			
Cadmium (Cd)		<0.50		0.50	ug/g	10-JUL-19	1.2			
Chromium (Cr)		14.8		1.0	ug/g	10-JUL-19	160			
Cobalt (Co)		4.8		1.0	ug/g	10-JUL-19	22			
Copper (Cu)		10.3		1.0	ug/g	10-JUL-19	140			
Lead (Pb)		10.0		1.0	ug/g	10-JUL-19	120			
Mercury (Hg)		0.0151		0.0050	ug/g	10-JUL-19	0.27			
Molybdenum (Mo)		1.4		1.0	ug/g	10-JUL-19	6.9			
Nickel (Ni)		8.0		1.0	ug/g	10-JUL-19	100			
Selenium (Se)		<1.0		1.0	ug/g	10-JUL-19	2.4			
Silver (Ag)		<0.20		0.20	ug/g	10-JUL-19	20			
Thallium (Tl)		<0.50		0.50	ug/g	10-JUL-19	1			
Uranium (U)		<1.0		1.0	ug/g	10-JUL-19	23			
Vanadium (V)		28.6		1.0	ug/g	10-JUL-19	86			
Zinc (Zn)		54.1		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
Chromium, Hexavalent		<0.20		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
Acetone		<0.50		0.50	ug/g	11-JUL-19	16			
Benzene		<0.0068		0.0068	ug/g	11-JUL-19	0.21			
Bromodichloromethane		<0.050		0.050	ug/g	11-JUL-19	1.5			
Bromoform		<0.050		0.050	ug/g	11-JUL-19	0.27			
Bromomethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
Carbon tetrachloride		<0.050		0.050	ug/g	11-JUL-19	0.05			
Chlorobenzene		<0.050		0.050	ug/g	11-JUL-19	2.4			
Dibromochloromethane		<0.050		0.050	ug/g	11-JUL-19	2.3			
Chloroform		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dibromoethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	1.2			
1,3-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	4.8			
1,4-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	0.083			
Dichlorodifluoromethane		<0.050		0.050	ug/g	11-JUL-19	16			
1,1-Dichloroethane		<0.050		0.050	ug/g	11-JUL-19	0.47			
1,2-Dichloroethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,1-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	0.05			
cis-1,2-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	1.9			
trans-1,2-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	0.084			
Methylene Chloride		<0.050		0.050	ug/g	11-JUL-19	0.1			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits				
Grouping	Analyte										
L2303880-1	S-11196246-270619-BH3S										
Sampled By: CLIENT on 27-JUN-19 @ 10:30											
Matrix: SOIL											
<b>Volatile Organic Compounds</b>							#1				
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05				
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1				
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8				
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16				
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7				
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75				
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7				
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058				
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28				
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3				
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38				
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061				
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4				
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02				
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19					
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19					
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1				
	Surrogate: 4-Bromofluorobenzene	79.2		50-140	%	11-JUL-19					
	Surrogate: 1,4-Difluorobenzene	95.6		50-140	%	11-JUL-19					
<b>Hydrocarbons</b>											
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55				
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55				
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98				
	F2-Naphth	<10		10	ug/g	11-JUL-19					
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300				
	F3-PAH	<50		50	ug/g	11-JUL-19					
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800				
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	11-JUL-19					
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19					
	Surrogate: 2-Bromobenzotrifluoride	85.9		60-140	%	07-JUL-19					
	Surrogate: 3,4-Dichlorotoluene	74.9		60-140	%	11-JUL-19					
<b>Polycyclic Aromatic Hydrocarbons</b>											
	Acenaphthene	<0.050		0.050	ug/g	09-JUL-19	7.9				
	Acenaphthylene	<0.050		0.050	ug/g	09-JUL-19	0.15				
	Anthracene	<0.050		0.050	ug/g	09-JUL-19	0.67				
	Benzo(a)anthracene	<0.050		0.050	ug/g	09-JUL-19	0.5				
	Benzo(a)pyrene	<0.050		0.050	ug/g	09-JUL-19	0.3				
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.78				
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	09-JUL-19	6.6				
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.78				
	Chrysene	<0.050		0.050	ug/g	09-JUL-19	7				

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)





# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits				
Grouping	Analyte										
L2303880-1	S-11196246-270619-BH3S										
Sampled By: CLIENT on 27-JUN-19 @ 10:30											
Matrix: SOIL											
<b>Polycyclic Aromatic Hydrocarbons</b>											
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	09-JUL-19	0.1				
	Fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.69				
	Fluorene	<0.050		0.050	ug/g	09-JUL-19	62				
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	09-JUL-19	0.38				
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	09-JUL-19	0.99				
	1-Methylnaphthalene	<0.030		0.030	ug/g	09-JUL-19	0.99				
	2-Methylnaphthalene	<0.030		0.030	ug/g	09-JUL-19	0.99				
	Naphthalene	<0.013		0.013	ug/g	09-JUL-19	0.6				
	Phenanthrene	<0.046		0.046	ug/g	09-JUL-19	6.2				
	Pyrene	<0.050		0.050	ug/g	09-JUL-19	78				
	Surrogate: 2-Fluorobiphenyl	93.0		50-140	%	09-JUL-19					
	Surrogate: p-Terphenyl d14	80.4		50-140	%	09-JUL-19					
L2303880-3	S-11196246-270619-BH4S										
Sampled By: CLIENT on 27-JUN-19 @ 10:30											
Matrix: SOIL											
<b>Physical Tests</b>											
	% Moisture	10.6		0.10	%	05-JUL-19					
<b>Hydrocarbons</b>											
	F1 (C6-C10)	<5.0		5.0	ug/g	10-JUL-19	55				
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98				
	F2-Naphth	<10		10	ug/g	10-JUL-19					
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300				
	F3-PAH	<50		50	ug/g	10-JUL-19					
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800				
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	10-JUL-19					
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19					
	Surrogate: 2-Bromobenzotrifluoride	88.7		60-140	%	07-JUL-19					
	Surrogate: 3,4-Dichlorotoluene	84.2		60-140	%	10-JUL-19					
<b>Polycyclic Aromatic Hydrocarbons</b>											
	Acenaphthene	<0.050		0.050	ug/g	09-JUL-19	7.9				
	Acenaphthylene	<0.050		0.050	ug/g	09-JUL-19	0.15				
	Anthracene	<0.050		0.050	ug/g	09-JUL-19	0.67				
	Benzo(a)anthracene	<0.050		0.050	ug/g	09-JUL-19	0.5				
	Benzo(a)pyrene	<0.050		0.050	ug/g	09-JUL-19	0.3				
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.78				
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	09-JUL-19	6.6				
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.78				
	Chrysene	<0.050		0.050	ug/g	09-JUL-19	7				
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	09-JUL-19	0.1				
	Fluoranthene	<0.050		0.050	ug/g	09-JUL-19	0.69				
	Fluorene	<0.050		0.050	ug/g	09-JUL-19	62				
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	09-JUL-19	0.38				
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	09-JUL-19	0.99				
	1-Methylnaphthalene	<0.030		0.030	ug/g	09-JUL-19	0.99				
	2-Methylnaphthalene	<0.030		0.030	ug/g	09-JUL-19	0.99				

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-3	S-11196246-270619-BH4S									
Sampled By: CLIENT on 27-JUN-19 @ 10:30										
Matrix: SOIL										
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Naphthalene	<0.013		0.013	ug/g	09-JUL-19	0.6			
	Phenanthrene	<0.046		0.046	ug/g	09-JUL-19	6.2			
	Pyrene	<0.050		0.050	ug/g	09-JUL-19	78			
	Surrogate: 2-Fluorobiphenyl	95.7		50-140	%	09-JUL-19				
	Surrogate: p-Terphenyl d14	83.2		50-140	%	09-JUL-19				
L2303880-5	S-11196246-280619-MW2S									
Sampled By: CLIENT on 28-JUN-19 @ 13:45										
Matrix: SOIL										
<b>Physical Tests</b>										
	% Moisture	11.5		0.10	%	05-JUL-19				
	pH	7.79		0.10	pH units	15-JUL-19				
<b>Metals</b>										
	Antimony (Sb)	<1.0		1.0	ug/g	10-JUL-19	7.5			
	Arsenic (As)	2.1		1.0	ug/g	10-JUL-19	18			
	Barium (Ba)	22.3		1.0	ug/g	10-JUL-19	390			
	Beryllium (Be)	<0.50		0.50	ug/g	10-JUL-19	4			
	Boron (B)	6.2		5.0	ug/g	10-JUL-19	120			
	Boron (B), Hot Water Ext.	0.23		0.10	ug/g	10-JUL-19	1.5			
	Cadmium (Cd)	<0.50		0.50	ug/g	10-JUL-19	1.2			
	Chromium (Cr)	10.7		1.0	ug/g	10-JUL-19	160			
	Cobalt (Co)	3.0		1.0	ug/g	10-JUL-19	22			
	Copper (Cu)	7.4		1.0	ug/g	10-JUL-19	140			
	Lead (Pb)	7.2		1.0	ug/g	10-JUL-19	120			
	Mercury (Hg)	0.0132		0.0050	ug/g	10-JUL-19	0.27			
	Molybdenum (Mo)	<1.0		1.0	ug/g	10-JUL-19	6.9			
	Nickel (Ni)	6.5		1.0	ug/g	10-JUL-19	100			
	Selenium (Se)	<1.0		1.0	ug/g	10-JUL-19	2.4			
	Silver (Ag)	<0.20		0.20	ug/g	10-JUL-19	20			
	Thallium (Tl)	<0.50		0.50	ug/g	10-JUL-19	1			
	Uranium (U)	<1.0		1.0	ug/g	10-JUL-19	23			
	Vanadium (V)	18.6		1.0	ug/g	10-JUL-19	86			
	Zinc (Zn)	33.4		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
	Chromium, Hexavalent	<0.20		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16			
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21			
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5			
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27			
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4			
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3			
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

**#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)**



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits				
Grouping	Analyte										
L2303880-5	S-11196246-280619-MW2S										
Sampled By:	CLIENT on 28-JUN-19 @ 13:45										
Matrix:	SOIL										
							#1				
<b>Volatile Organic Compounds</b>											
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2				
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8				
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083				
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16				
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47				
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05				
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9				
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084				
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1				
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05				
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1				
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8				
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16				
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7				
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75				
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7				
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058				
	1,1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28				
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3				
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38				
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061				
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4				
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02				
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19					
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19					
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1				
	Surrogate: 4-Bromofluorobenzene	81.8		50-140	%	11-JUL-19					
	Surrogate: 1,4-Difluorobenzene	99.7		50-140	%	11-JUL-19					
<b>Hydrocarbons</b>											
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55				
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55				
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98				
	F2-Naphth	<10		10	ug/g	11-JUL-19					
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300				
	F3-PAH	<50		50	ug/g	11-JUL-19					
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800				
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	11-JUL-19					
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19					
	Surrogate: 2-Bromobenzotrifluoride	85.5		60-140	%	07-JUL-19					

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-5	S-11196246-280619-MW2S									
Sampled By: CLIENT on 28-JUN-19 @ 13:45										
Matrix: SOIL										
<b>Hydrocarbons</b>										
Surrogate: 3,4-Dichlorotoluene		76.6		60-140	%	11-JUL-19				
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene		<0.050		0.050	ug/g	09-JUL-19	7.9			
Acenaphthylene		<0.050		0.050	ug/g	09-JUL-19	0.15			
Anthracene		<0.050		0.050	ug/g	09-JUL-19	0.67			
Benzo(a)anthracene		<0.050		0.050	ug/g	09-JUL-19	0.5			
Benzo(a)pyrene		<0.050		0.050	ug/g	09-JUL-19	0.3			
Benzo(b)fluoranthene		<0.050		0.050	ug/g	09-JUL-19	0.78			
Benzo(g,h,i)perylene		<0.050		0.050	ug/g	09-JUL-19	6.6			
Benzo(k)fluoranthene		<0.050		0.050	ug/g	09-JUL-19	0.78			
Chrysene		<0.050		0.050	ug/g	09-JUL-19	7			
Dibenzo(ah)anthracene		<0.050		0.050	ug/g	09-JUL-19	0.1			
Fluoranthene		<0.050		0.050	ug/g	09-JUL-19	0.69			
Fluorene		<0.050		0.050	ug/g	09-JUL-19	62			
Indeno(1,2,3-cd)pyrene		<0.050		0.050	ug/g	09-JUL-19	0.38			
1+2-Methylnaphthalenes		<0.042		0.042	ug/g	09-JUL-19	0.99			
1-Methylnaphthalene		<0.030		0.030	ug/g	09-JUL-19	0.99			
2-Methylnaphthalene		<0.030		0.030	ug/g	09-JUL-19	0.99			
Naphthalene		<0.013		0.013	ug/g	09-JUL-19	0.6			
Phenanthrene		<0.046		0.046	ug/g	09-JUL-19	6.2			
Pyrene		<0.050		0.050	ug/g	09-JUL-19	78			
Surrogate: 2-Fluorobiphenyl		95.9		50-140	%	09-JUL-19				
Surrogate: p-Terphenyl d14		84.7		50-140	%	09-JUL-19				
L2303880-6	S-11196246-280619-MW2S-99									
Sampled By: CLIENT on 28-JUN-19 @ 13:45										
Matrix: SOIL										
<b>Physical Tests</b>										
% Moisture		11.5		0.10	%	05-JUL-19				
<b>Metals</b>										
Antimony (Sb)		<1.0		1.0	ug/g	10-JUL-19	7.5			
Arsenic (As)		2.5		1.0	ug/g	10-JUL-19	18			
Barium (Ba)		25.4		1.0	ug/g	10-JUL-19	390			
Beryllium (Be)		<0.50		0.50	ug/g	10-JUL-19	4			
Boron (B)		6.6		5.0	ug/g	10-JUL-19	120			
Boron (B), Hot Water Ext.		0.23		0.10	ug/g	10-JUL-19	1.5			
Cadmium (Cd)		<0.50		0.50	ug/g	10-JUL-19	1.2			
Chromium (Cr)		10.7		1.0	ug/g	10-JUL-19	160			
Cobalt (Co)		3.5		1.0	ug/g	10-JUL-19	22			
Copper (Cu)		8.6		1.0	ug/g	10-JUL-19	140			
Lead (Pb)		9.0		1.0	ug/g	10-JUL-19	120			
Mercury (Hg)		0.0141		0.0050	ug/g	10-JUL-19	0.27			
Molybdenum (Mo)		<1.0		1.0	ug/g	10-JUL-19	6.9			
Nickel (Ni)		7.0		1.0	ug/g	10-JUL-19	100			
Selenium (Se)		<1.0		1.0	ug/g	10-JUL-19	2.4			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits		
Grouping	Analyte								
L2303880-6	S-11196246-280619-MW2S-99								
Sampled By: CLIENT on 28-JUN-19 @ 13:45									
Matrix: SOIL									
							#1		
<b>Metals</b>									
	Silver (Ag)	<0.20		0.20	ug/g	10-JUL-19	20		
	Thallium (Tl)	<0.50		0.50	ug/g	10-JUL-19	1		
	Uranium (U)	<1.0		1.0	ug/g	10-JUL-19	23		
	Vanadium (V)	22.1		1.0	ug/g	10-JUL-19	86		
	Zinc (Zn)	37.7		5.0	ug/g	10-JUL-19	340		
<b>Speciated Metals</b>									
	Chromium, Hexavalent	<0.20		0.20	ug/g	08-JUL-19	8		
<b>Volatile Organic Compounds</b>									
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16		
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21		
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5		
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27		
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4		
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3		
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2		
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8		
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083		
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16		
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47		
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05		
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9		
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084		
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1		
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19			
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19			
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05		
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1		
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8		
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16		
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7		
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75		
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7		
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058		
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28		
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3		
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38		
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061		

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits		
Grouping	Analyte								
L2303880-6	S-11196246-280619-MW2S-99								
Sampled By: CLIENT on 28-JUN-19 @ 13:45							#1		
Matrix: SOIL									
<b>Volatile Organic Compounds</b>									
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4		
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02		
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19			
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19			
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1		
	Surrogate: 4-Bromofluorobenzene	80.3		50-140	%	11-JUL-19			
	Surrogate: 1,4-Difluorobenzene	98.1		50-140	%	11-JUL-19			
<b>Hydrocarbons</b>									
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55		
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55		
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98		
	F2-Naphth	<10		10	ug/g	11-JUL-19			
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300		
	F3-PAH	<50		50	ug/g	11-JUL-19			
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800		
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	11-JUL-19			
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19			
	Surrogate: 2-Bromobenzotrifluoride	86.2		60-140	%	07-JUL-19			
	Surrogate: 3,4-Dichlorotoluene	72.9		60-140	%	11-JUL-19			
<b>Polycyclic Aromatic Hydrocarbons</b>									
	Acenaphthene	<0.050		0.050	ug/g	10-JUL-19	7.9		
	Acenaphthylene	<0.050		0.050	ug/g	10-JUL-19	0.15		
	Anthracene	<0.050		0.050	ug/g	10-JUL-19	0.67		
	Benzo(a)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.5		
	Benzo(a)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.3		
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78		
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	10-JUL-19	6.6		
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78		
	Chrysene	<0.050		0.050	ug/g	10-JUL-19	7		
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.1		
	Fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.69		
	Fluorene	<0.050		0.050	ug/g	10-JUL-19	62		
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.38		
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	10-JUL-19	0.99		
	1-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99		
	2-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99		
	Naphthalene	<0.013		0.013	ug/g	10-JUL-19	0.6		
	Phenanthrene	<0.046		0.046	ug/g	10-JUL-19	6.2		
	Pyrene	<0.050		0.050	ug/g	10-JUL-19	78		
	Surrogate: 2-Fluorobiphenyl	94.4		50-140	%	10-JUL-19			
	Surrogate: p-Terphenyl d14	81.0		50-140	%	10-JUL-19			
L2303880-7	S-11196246-280619-MW2D								
Sampled By: CLIENT on 28-JUN-19 @ 12:30							#1		
Matrix: SOIL									
<b>Physical Tests</b>									

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-7	S-11196246-280619-MW2D									
Sampled By: CLIENT on 28-JUN-19 @ 12:30										
Matrix: SOIL										
<b>Physical Tests</b>										
pH		7.87		0.10	pH units	15-JUL-19				
L2303880-9	S-11196246-280619-MW1S									
Sampled By: CLIENT on 28-JUN-19 @ 15:45										
Matrix: SOIL										
<b>Physical Tests</b>										
% Moisture		8.02		0.10	%	05-JUL-19				
<b>Metals</b>										
Antimony (Sb)		<1.0		1.0	ug/g	10-JUL-19	7.5			
Arsenic (As)		2.5		1.0	ug/g	10-JUL-19	18			
Barium (Ba)		21.2		1.0	ug/g	10-JUL-19	390			
Beryllium (Be)		<0.50		0.50	ug/g	10-JUL-19	4			
Boron (B)		6.2		5.0	ug/g	10-JUL-19	120			
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	10-JUL-19	1.5			
Cadmium (Cd)		<0.50		0.50	ug/g	10-JUL-19	1.2			
Chromium (Cr)		10.0		1.0	ug/g	10-JUL-19	160			
Cobalt (Co)		2.9		1.0	ug/g	10-JUL-19	22			
Copper (Cu)		8.1		1.0	ug/g	10-JUL-19	140			
Lead (Pb)		9.4		1.0	ug/g	10-JUL-19	120			
Mercury (Hg)		0.0137		0.0050	ug/g	10-JUL-19	0.27			
Molybdenum (Mo)		<1.0		1.0	ug/g	10-JUL-19	6.9			
Nickel (Ni)		6.0		1.0	ug/g	10-JUL-19	100			
Selenium (Se)		<1.0		1.0	ug/g	10-JUL-19	2.4			
Silver (Ag)		<0.20		0.20	ug/g	10-JUL-19	20			
Thallium (Tl)		<0.50		0.50	ug/g	10-JUL-19	1			
Uranium (U)		<1.0		1.0	ug/g	10-JUL-19	23			
Vanadium (V)		21.9		1.0	ug/g	10-JUL-19	86			
Zinc (Zn)		40.9		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
Chromium, Hexavalent		<0.20		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
Acetone		<0.50		0.50	ug/g	11-JUL-19	16			
Benzene		<0.0068		0.0068	ug/g	11-JUL-19	0.21			
Bromodichloromethane		<0.050		0.050	ug/g	11-JUL-19	1.5			
Bromoform		<0.050		0.050	ug/g	11-JUL-19	0.27			
Bromomethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
Carbon tetrachloride		<0.050		0.050	ug/g	11-JUL-19	0.05			
Chlorobenzene		<0.050		0.050	ug/g	11-JUL-19	2.4			
Dibromochloromethane		<0.050		0.050	ug/g	11-JUL-19	2.3			
Chloroform		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dibromoethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	1.2			
1,3-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	4.8			
1,4-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	0.083			
Dichlorodifluoromethane		<0.050		0.050	ug/g	11-JUL-19	16			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1			
L2303880-9	S-11196246-280619-MW1S									
Sampled By: CLIENT on 28-JUN-19 @ 15:45										
Matrix: SOIL										
<b>Volatile Organic Compounds</b>										
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47			
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9			
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084			
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1			
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05			
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1			
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8			
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16			
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7			
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75			
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7			
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058			
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28			
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3			
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38			
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061			
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4			
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02			
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19				
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19				
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1			
	Surrogate: 4-Bromofluorobenzene	82.1		50-140	%	11-JUL-19				
	Surrogate: 1,4-Difluorobenzene	100.1		50-140	%	11-JUL-19				
<b>Hydrocarbons</b>										
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55			
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55			
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98			
	F2-Naphth	<10		10	ug/g	11-JUL-19				
	F3 (C16-C34)	88		50	ug/g	07-JUL-19	300			
	F3-PAH	88		50	ug/g	11-JUL-19				
	F4 (C34-C50)	141		50	ug/g	07-JUL-19	2800			
	F4G-SG (GHH-Silica)	310		250	ug/g	05-JUL-19	2800			
	Total Hydrocarbons (C6-C50)	229		72	ug/g	11-JUL-19				
	Chrom. to baseline at nC50	NO			No Unit	07-JUL-19				
	Surrogate: 2-Bromobenzotrifluoride	84.0		60-140	%	07-JUL-19				
	Surrogate: 3,4-Dichlorotoluene	77.2		60-140	%	11-JUL-19				
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Acenaphthene	<0.050		0.050	ug/g	10-JUL-19	7.9			
	Acenaphthylene	<0.050		0.050	ug/g	10-JUL-19	0.15			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)





# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-9	S-11196246-280619-MW1S									
Sampled By: CLIENT on 28-JUN-19 @ 15:45										
Matrix: SOIL										
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Anthracene	<0.050		0.050	ug/g	10-JUL-19	0.67			
	Benzo(a)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.5			
	Benzo(a)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.3			
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78			
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	10-JUL-19	6.6			
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78			
	Chrysene	<0.050		0.050	ug/g	10-JUL-19	7			
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.1			
	Fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.69			
	Fluorene	<0.050		0.050	ug/g	10-JUL-19	62			
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.38			
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	10-JUL-19	0.99			
	1-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	2-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	Naphthalene	<0.013		0.013	ug/g	10-JUL-19	0.6			
	Phenanthrene	<0.046		0.046	ug/g	10-JUL-19	6.2			
	Pyrene	<0.050		0.050	ug/g	10-JUL-19	78			
	Surrogate: 2-Fluorobiphenyl	93.9		50-140	%	10-JUL-19				
	Surrogate: p-Terphenyl d14	81.1		50-140	%	10-JUL-19				
L2303880-10	S-11196246-020719-BH1S									
Sampled By: CLIENT on 02-JUL-19 @ 11:00										
Matrix: SOIL										
<b>Physical Tests</b>										
	% Moisture	5.08		0.10	%	05-JUL-19				
<b>Metals</b>										
	Antimony (Sb)	<1.0		1.0	ug/g	10-JUL-19	7.5			
	Arsenic (As)	2.6		1.0	ug/g	10-JUL-19	18			
	Barium (Ba)	28.9		1.0	ug/g	10-JUL-19	390			
	Beryllium (Be)	<0.50		0.50	ug/g	10-JUL-19	4			
	Boron (B)	5.2		5.0	ug/g	10-JUL-19	120			
	Boron (B), Hot Water Ext.	0.14		0.10	ug/g	10-JUL-19	1.5			
	Cadmium (Cd)	<0.50		0.50	ug/g	10-JUL-19	1.2			
	Chromium (Cr)	12.3		1.0	ug/g	10-JUL-19	160			
	Cobalt (Co)	3.4		1.0	ug/g	10-JUL-19	22			
	Copper (Cu)	8.2		1.0	ug/g	10-JUL-19	140			
	Lead (Pb)	11.5		1.0	ug/g	10-JUL-19	120			
	Mercury (Hg)	0.0234		0.0050	ug/g	10-JUL-19	0.27			
	Molybdenum (Mo)	<1.0		1.0	ug/g	10-JUL-19	6.9			
	Nickel (Ni)	7.0		1.0	ug/g	10-JUL-19	100			
	Selenium (Se)	<1.0		1.0	ug/g	10-JUL-19	2.4			
	Silver (Ag)	<0.20		0.20	ug/g	10-JUL-19	20			
	Thallium (Tl)	<0.50		0.50	ug/g	10-JUL-19	1			
	Uranium (U)	<1.0		1.0	ug/g	10-JUL-19	23			
	Vanadium (V)	22.9		1.0	ug/g	10-JUL-19	86			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-10	S-11196246-020719-BH1S									
Sampled By: CLIENT on 02-JUL-19 @ 11:00										
Matrix: SOIL										
<b>Metals</b>										
	Zinc (Zn)	46.8		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
	Chromium, Hexavalent	0.37		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16			
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21			
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5			
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27			
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4			
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3			
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2			
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8			
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083			
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16			
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47			
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9			
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084			
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1			
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05			
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1			
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8			
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16			
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7			
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75			
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7			
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058			
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28			
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3			
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38			
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061			
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4			
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02			
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19				
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19				
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1			
L2303880-10	S-11196246-020719-BH1S									
Sampled By: CLIENT on 02-JUL-19 @ 11:00										
Matrix: SOIL										
<b>Volatile Organic Compounds</b>										
Surrogate: 4-Bromofluorobenzene		89.5		50-140	%	11-JUL-19				
Surrogate: 1,4-Difluorobenzene		107.5		50-140	%	11-JUL-19				
<b>Hydrocarbons</b>										
F1 (C6-C10)		<5.0		5.0	ug/g	11-JUL-19	55			
F1-BTEX		<5.0		5.0	ug/g	11-JUL-19	55			
F2 (C10-C16)		<10		10	ug/g	07-JUL-19	98			
F2-Naphth		<10		10	ug/g	11-JUL-19				
F3 (C16-C34)		<50		50	ug/g	07-JUL-19	300			
F3-PAH		<50		50	ug/g	11-JUL-19				
F4 (C34-C50)		<50		50	ug/g	07-JUL-19	2800			
Total Hydrocarbons (C6-C50)		<72		72	ug/g	11-JUL-19				
Chrom. to baseline at nC50		YES			No Unit	07-JUL-19				
Surrogate: 2-Bromobenzotrifluoride		90.1		60-140	%	07-JUL-19				
Surrogate: 3,4-Dichlorotoluene		88.2		60-140	%	11-JUL-19				
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene		<0.050		0.050	ug/g	10-JUL-19	7.9			
Acenaphthylene		<0.050		0.050	ug/g	10-JUL-19	0.15			
Anthracene		<0.050		0.050	ug/g	10-JUL-19	0.67			
Benzo(a)anthracene		<0.050		0.050	ug/g	10-JUL-19	0.5			
Benzo(a)pyrene		<0.050		0.050	ug/g	10-JUL-19	0.3			
Benzo(b)fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.78			
Benzo(g,h,i)perylene		<0.050		0.050	ug/g	10-JUL-19	6.6			
Benzo(k)fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.78			
Chrysene		<0.050		0.050	ug/g	10-JUL-19	7			
Dibenzo(ah)anthracene		<0.050		0.050	ug/g	10-JUL-19	0.1			
Fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.69			
Fluorene		<0.050		0.050	ug/g	10-JUL-19	62			
Indeno(1,2,3-cd)pyrene		<0.050		0.050	ug/g	10-JUL-19	0.38			
1+2-Methylnaphthalenes		<0.042		0.042	ug/g	10-JUL-19	0.99			
1-Methylnaphthalene		<0.030		0.030	ug/g	10-JUL-19	0.99			
2-Methylnaphthalene		<0.030		0.030	ug/g	10-JUL-19	0.99			
Naphthalene		<0.013		0.013	ug/g	10-JUL-19	0.6			
Phenanthrene		<0.046		0.046	ug/g	10-JUL-19	6.2			
Pyrene		<0.050		0.050	ug/g	10-JUL-19	78			
Surrogate: 2-Fluorobiphenyl		91.0		50-140	%	10-JUL-19				
Surrogate: p-Terphenyl d14		79.2		50-140	%	10-JUL-19				
L2303880-12	S-11196246-030719-MW5S									
Sampled By: CLIENT on 03-JUL-19 @ 12:30										
Matrix: SOIL										
<b>Physical Tests</b>										
% Moisture		10.3		0.10	%	05-JUL-19				
pH		8.00		0.10	pH units	15-JUL-19				
<b>Metals</b>										
Antimony (Sb)		<1.0		1.0	ug/g	10-JUL-19	7.5			
Arsenic (As)		2.6		1.0	ug/g	10-JUL-19	18			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-12	S-11196246-030719-MW5S									
Sampled By: CLIENT on 03-JUL-19 @ 12:30										
Matrix: SOIL										
<b>Metals</b>							#1			
Barium (Ba)		23.4		1.0	ug/g	10-JUL-19	390			
Beryllium (Be)		<0.50		0.50	ug/g	10-JUL-19	4			
Boron (B)		6.4		5.0	ug/g	10-JUL-19	120			
Boron (B), Hot Water Ext.		0.15		0.10	ug/g	10-JUL-19	1.5			
Cadmium (Cd)		<0.50		0.50	ug/g	10-JUL-19	1.2			
Chromium (Cr)		12.0		1.0	ug/g	10-JUL-19	160			
Cobalt (Co)		3.4		1.0	ug/g	10-JUL-19	22			
Copper (Cu)		8.9		1.0	ug/g	10-JUL-19	140			
Lead (Pb)		7.1		1.0	ug/g	10-JUL-19	120			
Mercury (Hg)		0.0171		0.0050	ug/g	10-JUL-19	0.27			
Molybdenum (Mo)		<1.0		1.0	ug/g	10-JUL-19	6.9			
Nickel (Ni)		7.4		1.0	ug/g	10-JUL-19	100			
Selenium (Se)		<1.0		1.0	ug/g	10-JUL-19	2.4			
Silver (Ag)		<0.20		0.20	ug/g	10-JUL-19	20			
Thallium (Tl)		<0.50		0.50	ug/g	10-JUL-19	1			
Uranium (U)		<1.0		1.0	ug/g	10-JUL-19	23			
Vanadium (V)		22.2		1.0	ug/g	10-JUL-19	86			
Zinc (Zn)		31.8		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
Chromium, Hexavalent		0.28		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
Acetone		<0.50		0.50	ug/g	11-JUL-19	16			
Benzene		<0.0068		0.0068	ug/g	11-JUL-19	0.21			
Bromodichloromethane		<0.050		0.050	ug/g	11-JUL-19	1.5			
Bromoform		<0.050		0.050	ug/g	11-JUL-19	0.27			
Bromomethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
Carbon tetrachloride		<0.050		0.050	ug/g	11-JUL-19	0.05			
Chlorobenzene		<0.050		0.050	ug/g	11-JUL-19	2.4			
Dibromochloromethane		<0.050		0.050	ug/g	11-JUL-19	2.3			
Chloroform		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dibromoethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,2-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	1.2			
1,3-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	4.8			
1,4-Dichlorobenzene		<0.050		0.050	ug/g	11-JUL-19	0.083			
Dichlorodifluoromethane		<0.050		0.050	ug/g	11-JUL-19	16			
1,1-Dichloroethane		<0.050		0.050	ug/g	11-JUL-19	0.47			
1,2-Dichloroethane		<0.050		0.050	ug/g	11-JUL-19	0.05			
1,1-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	0.05			
cis-1,2-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	1.9			
trans-1,2-Dichloroethylene		<0.050		0.050	ug/g	11-JUL-19	0.084			
Methylene Chloride		<0.050		0.050	ug/g	11-JUL-19	0.1			
1,2-Dichloropropane		<0.050		0.050	ug/g	11-JUL-19	0.05			
cis-1,3-Dichloropropene		<0.030		0.030	ug/g	11-JUL-19				
trans-1,3-Dichloropropene		<0.030		0.030	ug/g	11-JUL-19				
1,3-Dichloropropene (cis & trans)		<0.042		0.042	ug/g	11-JUL-19	0.05			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits							
Grouping	Analyte													
L2303880-12	S-11196246-030719-MW5S													
Sampled By: CLIENT on 03-JUL-19 @ 12:30														
Matrix: SOIL														
<b>Volatile Organic Compounds</b>														
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19								
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19								
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19								
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19								
	MTBE	<0.050		0.050	ug/g	11-JUL-19								
	Styrene	<0.050		0.050	ug/g	11-JUL-19								
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19								
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19								
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19								
	Toluene	<0.080		0.080	ug/g	11-JUL-19								
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19								
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19								
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19								
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19								
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19								
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19								
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19								
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19								
	Surrogate: 4-Bromofluorobenzene	87.2		50-140	%	11-JUL-19								
	Surrogate: 1,4-Difluorobenzene	107.0		50-140	%	11-JUL-19								
<b>Hydrocarbons</b>														
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19								
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19								
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19								
	F2-Naphth	<10		10	ug/g	11-JUL-19								
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19								
	F3-PAH	<50		50	ug/g	11-JUL-19								
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19								
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	11-JUL-19								
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19								
	Surrogate: 2-Bromobenzotrifluoride	90.4		60-140	%	07-JUL-19								
	Surrogate: 3,4-Dichlorotoluene	88.4		60-140	%	11-JUL-19								
<b>Polycyclic Aromatic Hydrocarbons</b>														
	Acenaphthene	<0.050		0.050	ug/g	10-JUL-19								
	Acenaphthylene	<0.050		0.050	ug/g	10-JUL-19								
	Anthracene	<0.050		0.050	ug/g	10-JUL-19								
	Benzo(a)anthracene	<0.050		0.050	ug/g	10-JUL-19								
	Benzo(a)pyrene	<0.050		0.050	ug/g	10-JUL-19								
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	10-JUL-19								
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	10-JUL-19								
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	10-JUL-19								
	Chrysene	<0.050		0.050	ug/g	10-JUL-19								
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	10-JUL-19								
	Fluoranthene	<0.050		0.050	ug/g	10-JUL-19								
	Fluorene	<0.050		0.050	ug/g	10-JUL-19								
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	10-JUL-19								

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

**#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)**



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details Grouping	Analyte	Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
L2303880-12	S-11196246-030719-MW5S						#1			
Sampled By:	CLIENT on 03-JUL-19 @ 12:30									
Matrix:	SOIL									
<b>Polycyclic Aromatic Hydrocarbons</b>										
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	10-JUL-19	0.99			
	1-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	2-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	Naphthalene	<0.013		0.013	ug/g	10-JUL-19	0.6			
	Phenanthrene	<0.046		0.046	ug/g	10-JUL-19	6.2			
	Pyrene	<0.050		0.050	ug/g	10-JUL-19	78			
	Surrogate: 2-Fluorobiphenyl	92.2		50-140	%	10-JUL-19				
	Surrogate: p-Terphenyl d14	80.4		50-140	%	10-JUL-19				
L2303880-13	S-11196246-030719-MW5S-99						#1			
Sampled By:	CLIENT on 03-JUL-19 @ 12:30									
Matrix:	SOIL									
<b>Physical Tests</b>										
	% Moisture	10.0		0.10	%	05-JUL-19				
	pH	8.21		0.10	pH units	15-JUL-19				
<b>Metals</b>										
	Antimony (Sb)	<1.0		1.0	ug/g	10-JUL-19	7.5			
	Arsenic (As)	3.2		1.0	ug/g	10-JUL-19	18			
	Barium (Ba)	31.9		1.0	ug/g	10-JUL-19	390			
	Beryllium (Be)	<0.50		0.50	ug/g	10-JUL-19	4			
	Boron (B)	7.9		5.0	ug/g	10-JUL-19	120			
	Boron (B), Hot Water Ext.	0.14		0.10	ug/g	10-JUL-19	1.5			
	Cadmium (Cd)	<0.50		0.50	ug/g	10-JUL-19	1.2			
	Chromium (Cr)	14.9		1.0	ug/g	10-JUL-19	160			
	Cobalt (Co)	4.5		1.0	ug/g	10-JUL-19	22			
	Copper (Cu)	11.2		1.0	ug/g	10-JUL-19	140			
	Lead (Pb)	9.3		1.0	ug/g	10-JUL-19	120			
	Mercury (Hg)	0.0208		0.0050	ug/g	10-JUL-19	0.27			
	Molybdenum (Mo)	<1.0		1.0	ug/g	10-JUL-19	6.9			
	Nickel (Ni)	9.3		1.0	ug/g	10-JUL-19	100			
	Selenium (Se)	<1.0		1.0	ug/g	10-JUL-19	2.4			
	Silver (Ag)	<0.20		0.20	ug/g	10-JUL-19	20			
	Thallium (Tl)	<0.50		0.50	ug/g	10-JUL-19	1			
	Uranium (U)	<1.0		1.0	ug/g	10-JUL-19	23			
	Vanadium (V)	28.4		1.0	ug/g	10-JUL-19	86			
	Zinc (Zn)	42.8		5.0	ug/g	10-JUL-19	340			
<b>Speciated Metals</b>										
	Chromium, Hexavalent	0.29		0.20	ug/g	08-JUL-19	8			
<b>Volatile Organic Compounds</b>										
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16			
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21			
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5			
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27			
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

**#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)**



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits				
Grouping	Analyte										
L2303880-13	S-11196246-030719-MW5S-99										
Sampled By: CLIENT on 03-JUL-19 @ 12:30											
Matrix: SOIL											
<b>Volatile Organic Compounds</b>							#1				
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4				
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3				
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05				
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2				
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8				
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083				
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16				
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47				
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05				
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9				
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084				
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1				
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19					
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05				
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1				
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8				
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16				
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7				
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75				
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7				
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058				
	1,1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28				
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3				
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38				
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05				
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061				
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4				
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02				
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19					
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19					
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1				
	Surrogate: 4-Bromofluorobenzene	78.4		50-140	%	11-JUL-19					
	Surrogate: 1,4-Difluorobenzene	95.1		50-140	%	11-JUL-19					
<b>Hydrocarbons</b>											
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55				
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55				
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98				
	F2-Naphth	<10		10	ug/g	11-JUL-19					
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300				
	F3-PAH	<50		50	ug/g	11-JUL-19					
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800				

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-13	S-11196246-030719-MW5S-99									
Sampled By: CLIENT on 03-JUL-19 @ 12:30										
Matrix: SOIL										
<b>Hydrocarbons</b>										
Total Hydrocarbons (C6-C50)		<72		72	ug/g	11-JUL-19				
Chrom. to baseline at nC50		YES			No Unit	07-JUL-19				
Surrogate: 2-Bromobenzotrifluoride		87.4		60-140	%	07-JUL-19				
Surrogate: 3,4-Dichlorotoluene		77.4		60-140	%	11-JUL-19				
<b>Polycyclic Aromatic Hydrocarbons</b>										
Acenaphthene		<0.050		0.050	ug/g	10-JUL-19	7.9			
Acenaphthylene		<0.050		0.050	ug/g	10-JUL-19	0.15			
Anthracene		<0.050		0.050	ug/g	10-JUL-19	0.67			
Benzo(a)anthracene		<0.050		0.050	ug/g	10-JUL-19	0.5			
Benzo(a)pyrene		<0.050		0.050	ug/g	10-JUL-19	0.3			
Benzo(b)fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.78			
Benzo(g,h,i)perylene		<0.050		0.050	ug/g	10-JUL-19	6.6			
Benzo(k)fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.78			
Chrysene		<0.050		0.050	ug/g	10-JUL-19	7			
Dibenzo(ah)anthracene		<0.050		0.050	ug/g	10-JUL-19	0.1			
Fluoranthene		<0.050		0.050	ug/g	10-JUL-19	0.69			
Fluorene		<0.050		0.050	ug/g	10-JUL-19	62			
Indeno(1,2,3-cd)pyrene		<0.050		0.050	ug/g	10-JUL-19	0.38			
1+2-Methylnaphthalenes		<0.042		0.042	ug/g	10-JUL-19	0.99			
1-Methylnaphthalene		<0.030		0.030	ug/g	10-JUL-19	0.99			
2-Methylnaphthalene		<0.030		0.030	ug/g	10-JUL-19	0.99			
Naphthalene		<0.013		0.013	ug/g	10-JUL-19	0.6			
Phenanthrene		<0.046		0.046	ug/g	10-JUL-19	6.2			
Pyrene		<0.050		0.050	ug/g	10-JUL-19	78			
Surrogate: 2-Fluorobiphenyl		93.3		50-140	%	10-JUL-19				
Surrogate: p-Terphenyl d14		80.3		50-140	%	10-JUL-19				
L2303880-14	S-11196246-030719-MW5D									
Sampled By: CLIENT on 03-JUL-19 @ 12:45										
Matrix: SOIL										
<b>Physical Tests</b>										
pH		7.83		0.10	pH units	15-JUL-19				
L2303880-15	S-11196246-030719-BH2S									
Sampled By: CLIENT on 03-JUL-19 @ 13:30										
Matrix: SOIL										
<b>Physical Tests</b>										
% Moisture		8.14		0.10	%	05-JUL-19				
<b>Metals</b>										
Antimony (Sb)		<1.0		1.0	ug/g	10-JUL-19	7.5			
Arsenic (As)		2.0		1.0	ug/g	10-JUL-19	18			
Barium (Ba)		16.7		1.0	ug/g	10-JUL-19	390			
Beryllium (Be)		<0.50		0.50	ug/g	10-JUL-19	4			
Boron (B)		5.5		5.0	ug/g	10-JUL-19	120			
Boron (B), Hot Water Ext.		<0.10		0.10	ug/g	10-JUL-19	1.5			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

**#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)**





# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits		
Grouping	Analyte								
L2303880-15	S-11196246-030719-BH2S								
Sampled By: CLIENT on 03-JUL-19 @ 13:30									
Matrix: SOIL									
							#1		
<b>Metals</b>									
	Cadmium (Cd)	<0.50		0.50	ug/g	10-JUL-19	1.2		
	Chromium (Cr)	8.7		1.0	ug/g	10-JUL-19	160		
	Cobalt (Co)	2.7		1.0	ug/g	10-JUL-19	22		
	Copper (Cu)	7.1		1.0	ug/g	10-JUL-19	140		
	Lead (Pb)	6.1		1.0	ug/g	10-JUL-19	120		
	Mercury (Hg)	0.0104		0.0050	ug/g	10-JUL-19	0.27		
	Molybdenum (Mo)	<1.0		1.0	ug/g	10-JUL-19	6.9		
	Nickel (Ni)	5.5		1.0	ug/g	10-JUL-19	100		
	Selenium (Se)	<1.0		1.0	ug/g	10-JUL-19	2.4		
	Silver (Ag)	<0.20		0.20	ug/g	10-JUL-19	20		
	Thallium (Tl)	<0.50		0.50	ug/g	10-JUL-19	1		
	Uranium (U)	<1.0		1.0	ug/g	10-JUL-19	23		
	Vanadium (V)	17.6		1.0	ug/g	10-JUL-19	86		
	Zinc (Zn)	27.3		5.0	ug/g	10-JUL-19	340		
<b>Speciated Metals</b>									
	Chromium, Hexavalent	<0.20		0.20	ug/g	08-JUL-19	8		
<b>Volatile Organic Compounds</b>									
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16		
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21		
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5		
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27		
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4		
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3		
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2		
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8		
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083		
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16		
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47		
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05		
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9		
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084		
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1		
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19			
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19			
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05		
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1		
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8		
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16		
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7		

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte						#1			
L2303880-15	S-11196246-030719-BH2S									
Sampled By: CLIENT on 03-JUL-19 @ 13:30										
Matrix: SOIL										
<b>Volatile Organic Compounds</b>										
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75			
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7			
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058			
	1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28			
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3			
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38			
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061			
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4			
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02			
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19				
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19				
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1			
	Surrogate: 4-Bromofluorobenzene	86.9		50-140	%	11-JUL-19				
	Surrogate: 1,4-Difluorobenzene	106.5		50-140	%	11-JUL-19				
<b>Hydrocarbons</b>										
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55			
	F1-BTEX	<5.0		5.0	ug/g	11-JUL-19	55			
	F2 (C10-C16)	<10		10	ug/g	07-JUL-19	98			
	F2-Naphth	<10		10	ug/g	11-JUL-19				
	F3 (C16-C34)	<50		50	ug/g	07-JUL-19	300			
	F3-PAH	<50		50	ug/g	11-JUL-19				
	F4 (C34-C50)	<50		50	ug/g	07-JUL-19	2800			
	Total Hydrocarbons (C6-C50)	<72		72	ug/g	11-JUL-19				
	Chrom. to baseline at nC50	YES			No Unit	07-JUL-19				
	Surrogate: 2-Bromobenzotrifluoride	88.3		60-140	%	07-JUL-19				
	Surrogate: 3,4-Dichlorotoluene	87.2		60-140	%	11-JUL-19				
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Acenaphthene	<0.050		0.050	ug/g	10-JUL-19	7.9			
	Acenaphthylene	<0.050		0.050	ug/g	10-JUL-19	0.15			
	Anthracene	<0.050		0.050	ug/g	10-JUL-19	0.67			
	Benzo(a)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.5			
	Benzo(a)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.3			
	Benzo(b)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78			
	Benzo(g,h,i)perylene	<0.050		0.050	ug/g	10-JUL-19	6.6			
	Benzo(k)fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.78			
	Chrysene	<0.050		0.050	ug/g	10-JUL-19	7			
	Dibenzo(ah)anthracene	<0.050		0.050	ug/g	10-JUL-19	0.1			
	Fluoranthene	<0.050		0.050	ug/g	10-JUL-19	0.69			
	Fluorene	<0.050		0.050	ug/g	10-JUL-19	62			
	Indeno(1,2,3-cd)pyrene	<0.050		0.050	ug/g	10-JUL-19	0.38			
	1+2-Methylnaphthalenes	<0.042		0.042	ug/g	10-JUL-19	0.99			
	1-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	2-Methylnaphthalene	<0.030		0.030	ug/g	10-JUL-19	0.99			
	Naphthalene	<0.013		0.013	ug/g	10-JUL-19	0.6			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits			
Grouping	Analyte									
L2303880-15	S-11196246-030719-BH2S									
Sampled By: CLIENT on 03-JUL-19 @ 13:30							#1			
Matrix: SOIL										
<b>Polycyclic Aromatic Hydrocarbons</b>										
	Phenanthrene	<0.046		0.046	ug/g	10-JUL-19	6.2			
	Pyrene	<0.050		0.050	ug/g	10-JUL-19	78			
	Surrogate: 2-Fluorobiphenyl	94.2		50-140	%	10-JUL-19				
	Surrogate: p-Terphenyl d14	81.3		50-140	%	10-JUL-19				
L2303880-17	S-11196246-030719-TRIP BLANK									
Sampled By: CLIENT on 03-JUL-19 @ 14:00							#1			
Matrix: SOIL										
<b>Physical Tests</b>										
	% Moisture	<0.10		0.10	%	05-JUL-19				
<b>Volatile Organic Compounds</b>										
	Acetone	<0.50		0.50	ug/g	11-JUL-19	16			
	Benzene	<0.0068		0.0068	ug/g	11-JUL-19	0.21			
	Bromodichloromethane	<0.050		0.050	ug/g	11-JUL-19	1.5			
	Bromoform	<0.050		0.050	ug/g	11-JUL-19	0.27			
	Bromomethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Carbon tetrachloride	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Chlorobenzene	<0.050		0.050	ug/g	11-JUL-19	2.4			
	Dibromochloromethane	<0.050		0.050	ug/g	11-JUL-19	2.3			
	Chloroform	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,2-Dibromoethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,2-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	1.2			
	1,3-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	4.8			
	1,4-Dichlorobenzene	<0.050		0.050	ug/g	11-JUL-19	0.083			
	Dichlorodifluoromethane	<0.050		0.050	ug/g	11-JUL-19	16			
	1,1-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.47			
	1,2-Dichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	1,1-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	1.9			
	trans-1,2-Dichloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.084			
	Methylene Chloride	<0.050		0.050	ug/g	11-JUL-19	0.1			
	1,2-Dichloropropane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	cis-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	trans-1,3-Dichloropropene	<0.030		0.030	ug/g	11-JUL-19				
	1,3-Dichloropropene (cis & trans)	<0.042		0.042	ug/g	11-JUL-19	0.05			
	Ethylbenzene	<0.018		0.018	ug/g	11-JUL-19	1.1			
	n-Hexane	<0.050		0.050	ug/g	11-JUL-19	2.8			
	Methyl Ethyl Ketone	<0.50		0.50	ug/g	11-JUL-19	16			
	Methyl Isobutyl Ketone	<0.50		0.50	ug/g	11-JUL-19	1.7			
	MTBE	<0.050		0.050	ug/g	11-JUL-19	0.75			
	Styrene	<0.050		0.050	ug/g	11-JUL-19	0.7			
	1,1,1,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.058			
	1,1,1,2,2-Tetrachloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05			
	Tetrachloroethylene	<0.050		0.050	ug/g	11-JUL-19	0.28			
	Toluene	<0.080		0.080	ug/g	11-JUL-19	2.3			
	1,1,1-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.38			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

### T2-Soil-Res/Park/Inst. Property Use (Coarse)

#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)



# ANALYTICAL GUIDELINE REPORT

11196246

Sample Details		Result	Qualifier	D.L.	Units	Analyzed	Guideline Limits		
Grouping	Analyte						#1		
L2303880-17	S-11196246-030719-TRIP BLANK								
Sampled By: CLIENT on 03-JUL-19 @ 14:00									
Matrix: SOIL									
<b>Volatile Organic Compounds</b>									
	1,1,2-Trichloroethane	<0.050		0.050	ug/g	11-JUL-19	0.05		
	Trichloroethylene	<0.010		0.010	ug/g	11-JUL-19	0.061		
	Trichlorofluoromethane	<0.050		0.050	ug/g	11-JUL-19	4		
	Vinyl chloride	<0.020		0.020	ug/g	11-JUL-19	0.02		
	o-Xylene	<0.020		0.020	ug/g	11-JUL-19			
	m+p-Xylenes	<0.030		0.030	ug/g	11-JUL-19			
	Xylenes (Total)	<0.050		0.050	ug/g	11-JUL-19	3.1		
	Surrogate: 4-Bromofluorobenzene	81.3		50-140	%	11-JUL-19			
	Surrogate: 1,4-Difluorobenzene	100.2		50-140	%	11-JUL-19			
<b>Hydrocarbons</b>									
	F1 (C6-C10)	<5.0		5.0	ug/g	11-JUL-19	55		
	Surrogate: 3,4-Dichlorotoluene	68.0		60-140	%	11-JUL-19			

\*\* Detection Limit for result exceeds Guideline Limit. Assessment against Guideline Limit cannot be made.

\* Analytical result for this parameter exceeds Guideline Limit listed on this report. Guideline Limits applied:

**T2-Soil-Res/Park/Inst. Property Use (Coarse)**

**#1: T2-Soil-Res/Park/Inst. Property Use (Coarse)**

## Reference Information

### Methods Listed (if applicable):

ALS Test Code	Matrix	Test Description	Method Reference***
B-HWS-R511-WT	Soil	Boron-HWE-O.Reg 153/04 (July 2011)	HW EXTR, EPA 6010B

A dried solid sample is extracted with calcium chloride, the sample undergoes a heating process. After cooling the sample is filtered and analyzed by ICP/OES.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

CR-CR6-IC-WT	Soil	Hexavalent Chromium in Soil	SW846 3060A/7199
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This analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

F1-F4-511-CALC-WT	Soil	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-S
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Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

Hydrocarbon results are expressed on a dry weight basis.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT	Soil	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
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Fraction F1 is determined by extracting a soil or sediment sample as received with methanol, then analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT	Soil	F2-F4-O.Reg 153/04 (July 2011)	CCME Tier 1
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Petroleum Hydrocarbons (F2-F4 fractions) are extracted from soil with 1:1 hexane:acetone using a rotary extractor. Extracts are treated with silica gel to remove polar organic interferences. F2, F3, & F4 are analyzed by GC-FID. F4G-sg is analyzed gravimetrically.

#### Notes:

1. F2 (C10-C16): Sum of all hydrocarbons that elute between nC10 and nC16.
2. F3 (C16-C34): Sum of all hydrocarbons that elute between nC16 and nC34.
3. F4 (C34-C50): Sum of all hydrocarbons that elute between nC34 and nC50.
4. F4G: Gravimetric Heavy Hydrocarbons
5. F4G-sg: Gravimetric Heavy Hydrocarbons (F4G) after silica gel treatment.
6. Where both F4 (C34-C50) and F4G-sg are reported for a sample, the larger of the two values is used for comparison against the relevant CCME guideline for F4.
7. F4G-sg cannot be added to the C6 to C50 hydrocarbon results to obtain an estimate of total extractable hydrocarbons.
8. This method is validated for use.
9. Data from analysis of validation and quality control samples is available upon request.
10. Reported results are expressed as milligrams per dry kilogram, unless otherwise indicated.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

## Reference Information

F4G-ADD-511-WT      Soil      F4G SG-O.Reg 153/04 (July 2011)      MOE DECPH-E3398/CCME TIER 1

F4G, gravimetric analysis, is determined if the chromatogram does not return to baseline at or before C50. A soil sample is extracted with a solvent mix, the solvent is evaporated and the weight of the residue is determined.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

HG-200.2-CVAA-WT      Soil      Mercury in Soil by CVAAS      EPA 200.2/1631E (mod)

Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-200.2-CCMS-WT      Soil      Metals in Soil by CRC ICPMS      EPA 200.2/6020A (mod)

Soil/sediment is dried, disaggregated, and sieved (2 mm). For tests intended to support Ontario regulations, the <2mm fraction is ground to pass through a 0.355 mm sieve. Strong Acid Leachable Metals in the <2mm fraction are solubilized by heated digestion with nitric and hydrochloric acids. Instrumental analysis is by Collision / Reaction Cell ICPMS.

Limitations: This method is intended to liberate environmentally available metals. Silicate minerals are not solubilized. Some metals may be only partially recovered (matrix dependent), including Al, Ba, Be, Cr, S, Sr, Ti, Tl, V, W, and Zr. Elemental Sulfur may be poorly recovered by this method. Volatile forms of sulfur (e.g. sulfide, H<sub>2</sub>S) may be excluded if lost during sampling, storage, or digestion.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT      Soil      ABN-Calculated Parameters      SW846 8270  
MOISTURE-WT      Soil      % Moisture      CCME PHC in Soil - Tier 1 (mod)  
PAH-511-WT      Soil      PAH-O.Reg 153/04 (July 2011)      SW846 3510/8270

A representative sub-sample of soil is fortified with deuterium-labelled surrogates and a mechanical shaking technique is used to extract the sample with a mixture of methanol and toluene. The extracts are concentrated and analyzed by GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

PH-WT      Soil      pH      MOEE E3137A

A minimum 10g portion of the sample is extracted with 20mL of 0.01M calcium chloride solution by shaking for at least 30 minutes. The aqueous layer is separated from the soil and then analyzed using a pH meter and electrode.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

VOC-1,3-DCP-CALC-WT      Soil      Regulation 153 VOCs      SW8260B/SW8270C  
VOC-511-HS-WT      Soil      VOC-O.Reg 153/04 (July 2011)      SW846 8260 (511)

Soil and sediment samples are extracted in methanol and analyzed by headspace-GC/MS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT      Soil      Sum of Xylene Isomer Concentrations      CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

\*\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

Chain of Custody numbers:

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location	Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA		

## Reference Information

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guideline limits are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.



### Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>B-HWS-R511-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4702663</b>							
<b>WG3100035-4</b>	<b>DUP</b>	<b>L2304152-1</b>						
Boron (B), Hot Water Ext.		<0.10	<0.10	RPD-NA	ug/g	N/A	30	10-JUL-19
<b>WG3100035-2</b>	<b>IRM</b>	<b>WT SAR3</b>						
Boron (B), Hot Water Ext.			96.5		%		70-130	10-JUL-19
<b>WG3100035-3</b>	<b>LCS</b>							
Boron (B), Hot Water Ext.			91.9		%		70-130	10-JUL-19
<b>WG3100035-1</b>	<b>MB</b>							
Boron (B), Hot Water Ext.			<0.10		ug/g		0.1	10-JUL-19
<b>CR-CR6-IC-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4698491</b>							
<b>WG3096511-4</b>	<b>CRM</b>	<b>WT-SQC012</b>						
Chromium, Hexavalent			84.9		%		70-130	08-JUL-19
<b>WG3096511-3</b>	<b>DUP</b>	<b>L2303880-3</b>						
Chromium, Hexavalent		<0.20	<0.20	RPD-NA	ug/g	N/A	35	08-JUL-19
<b>WG3096511-2</b>	<b>LCS</b>							
Chromium, Hexavalent			90.2		%		80-120	08-JUL-19
<b>WG3096511-1</b>	<b>MB</b>							
Chromium, Hexavalent			<0.20		ug/g		0.2	08-JUL-19
<b>F1-HS-511-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4703951</b>							
<b>WG3099549-4</b>	<b>DUP</b>	<b>WG3099549-3</b>						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	10-JUL-19
<b>WG3099549-2</b>	<b>LCS</b>							
F1 (C6-C10)			102.7		%		80-120	10-JUL-19
<b>WG3099549-1</b>	<b>MB</b>							
F1 (C6-C10)			<5.0		ug/g		5	10-JUL-19
Surrogate: 3,4-Dichlorotoluene			91.0		%		60-140	10-JUL-19
<b>WG3099549-6</b>	<b>MS</b>	<b>L2303880-3</b>						
F1 (C6-C10)			99.98		%		60-140	10-JUL-19
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-4</b>	<b>DUP</b>	<b>WG3099516-3</b>						
F1 (C6-C10)		<5.0	<5.0	RPD-NA	ug/g	N/A	30	11-JUL-19
<b>WG3099516-2</b>	<b>LCS</b>							
F1 (C6-C10)			96.9		%		80-120	11-JUL-19
<b>WG3099516-1</b>	<b>MB</b>							
F1 (C6-C10)			<5.0		ug/g		5	11-JUL-19
Surrogate: 3,4-Dichlorotoluene			86.7		%		60-140	11-JUL-19





### Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

Page 2 of 14

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>F1-HS-511-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-7</b>	<b>MS</b>	<b>L2304301-1</b>						
F1 (C6-C10)			96.4		%		60-140	11-JUL-19
<b>F2-F4-511-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4696212</b>							
<b>WG3096414-3</b>	<b>DUP</b>	<b>WG3096414-5</b>						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	07-JUL-19
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	07-JUL-19
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	07-JUL-19
<b>WG3096414-2</b>	<b>LCS</b>							
F2 (C10-C16)			107.8		%		80-120	07-JUL-19
F3 (C16-C34)			108.9		%		80-120	07-JUL-19
F4 (C34-C50)			112.0		%		80-120	07-JUL-19
<b>WG3096414-1</b>	<b>MB</b>							
F2 (C10-C16)			<10		ug/g		10	07-JUL-19
F3 (C16-C34)			<50		ug/g		50	07-JUL-19
F4 (C34-C50)			<50		ug/g		50	07-JUL-19
Surrogate: 2-Bromobenzotrifluoride			78.6		%		60-140	07-JUL-19
<b>WG3096414-4</b>	<b>MS</b>	<b>WG3096414-5</b>						
F2 (C10-C16)			101.9		%		60-140	07-JUL-19
F3 (C16-C34)			103.3		%		60-140	07-JUL-19
F4 (C34-C50)			109.0		%		60-140	07-JUL-19
<b>Batch</b>	<b>R4696363</b>							
<b>WG3096579-3</b>	<b>DUP</b>	<b>WG3096579-5</b>						
F2 (C10-C16)		<10	<10	RPD-NA	ug/g	N/A	30	07-JUL-19
F3 (C16-C34)		<50	<50	RPD-NA	ug/g	N/A	30	07-JUL-19
F4 (C34-C50)		<50	<50	RPD-NA	ug/g	N/A	30	07-JUL-19
<b>WG3096579-2</b>	<b>LCS</b>							
F2 (C10-C16)			105.6		%		80-120	07-JUL-19
F3 (C16-C34)			107.8		%		80-120	07-JUL-19
F4 (C34-C50)			112.0		%		80-120	07-JUL-19
<b>WG3096579-1</b>	<b>MB</b>							
F2 (C10-C16)			<10		ug/g		10	07-JUL-19
F3 (C16-C34)			<50		ug/g		50	07-JUL-19
F4 (C34-C50)			<50		ug/g		50	07-JUL-19
Surrogate: 2-Bromobenzotrifluoride			77.0		%		60-140	07-JUL-19



### Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>F2-F4-511-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4696363</b>							
<b>WG3096579-4 MS</b>		<b>WG3096579-5</b>						
F2 (C10-C16)			107.1		%		60-140	07-JUL-19
F3 (C16-C34)			103.2		%		60-140	07-JUL-19
F4 (C34-C50)			107.3		%		60-140	07-JUL-19
<b>F4G-ADD-511-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4697533</b>							
<b>WG3099418-2 LCS</b>								
F4G-SG (GHH-Silica)			66.0		%		60-140	05-JUL-19
<b>WG3099418-1 MB</b>								
F4G-SG (GHH-Silica)			<250		ug/g		250	05-JUL-19
<b>HG-200.2-CVAA-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4703570</b>							
<b>WG3099966-2 CRM</b>		<b>WT-CANMET-TILL1</b>						
Mercury (Hg)			106.1		%		70-130	10-JUL-19
<b>WG3099966-6 DUP</b>		<b>WG3099966-5</b>						
Mercury (Hg)		<0.0050	<0.0050	RPD-NA	ug/g	N/A	40	10-JUL-19
<b>WG3099966-3 LCS</b>								
Mercury (Hg)			104.5		%		80-120	10-JUL-19
<b>WG3099966-1 MB</b>								
Mercury (Hg)			<0.0050		mg/kg		0.005	10-JUL-19
<b>MET-200.2-CCMS-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4704052</b>							
<b>WG3099966-2 CRM</b>		<b>WT-CANMET-TILL1</b>						
Antimony (Sb)			102.4		%		70-130	10-JUL-19
Arsenic (As)			96.1		%		70-130	10-JUL-19
Barium (Ba)			93.4		%		70-130	10-JUL-19
Beryllium (Be)			94.7		%		70-130	10-JUL-19
Boron (B)			3.2		mg/kg		0-8.2	10-JUL-19
Cadmium (Cd)			95.3		%		70-130	10-JUL-19
Chromium (Cr)			102.3		%		70-130	10-JUL-19
Cobalt (Co)			98.8		%		70-130	10-JUL-19
Copper (Cu)			100.3		%		70-130	10-JUL-19
Lead (Pb)			96.5		%		70-130	10-JUL-19
Molybdenum (Mo)			98.4		%		70-130	10-JUL-19
Nickel (Ni)			99.9		%		70-130	10-JUL-19
Selenium (Se)			0.28		mg/kg		0.11-0.51	10-JUL-19



## Quality Control Report

Workorder: L2303880

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**Client:** GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

**Contact:** Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-WT Soil</b>								
<b>Batch</b>	<b>R4704052</b>							
<b>WG3099966-2 CRM</b>		<b>WT-CANMET-TILL1</b>						
Silver (Ag)			0.23		mg/kg		0.13-0.33	10-JUL-19
Thallium (Tl)			0.125		mg/kg		0.077-0.18	10-JUL-19
Uranium (U)			102.4		%		70-130	10-JUL-19
Vanadium (V)			100.5		%		70-130	10-JUL-19
Zinc (Zn)			96.2		%		70-130	10-JUL-19
<b>WG3099966-6 DUP</b>		<b>WG3099966-5</b>						
Antimony (Sb)		<0.10	<0.10	RPD-NA	ug/g	N/A	30	10-JUL-19
Arsenic (As)		1.36	1.37		ug/g	0.7	30	10-JUL-19
Barium (Ba)		33.9	35.5		ug/g	4.8	40	10-JUL-19
Beryllium (Be)		0.27	0.27		ug/g	0.2	30	10-JUL-19
Boron (B)		5.8	5.8		ug/g	0.8	30	10-JUL-19
Cadmium (Cd)		0.033	0.035		ug/g	6.5	30	10-JUL-19
Chromium (Cr)		13.7	13.7		ug/g	0.1	30	10-JUL-19
Cobalt (Co)		4.22	4.27		ug/g	1.3	30	10-JUL-19
Copper (Cu)		8.54	8.85		ug/g	3.6	30	10-JUL-19
Lead (Pb)		3.47	3.61		ug/g	3.7	40	10-JUL-19
Molybdenum (Mo)		0.19	0.23		ug/g	20	40	10-JUL-19
Nickel (Ni)		7.67	8.08		ug/g	5.2	30	10-JUL-19
Selenium (Se)		<0.20	<0.20	RPD-NA	ug/g	N/A	30	10-JUL-19
Silver (Ag)		<0.10	<0.10	RPD-NA	ug/g	N/A	40	10-JUL-19
Thallium (Tl)		0.055	0.059		ug/g	8.3	30	10-JUL-19
Uranium (U)		0.426	0.438		ug/g	2.8	30	10-JUL-19
Vanadium (V)		29.5	29.1		ug/g	1.4	30	10-JUL-19
Zinc (Zn)		18.6	19.4		ug/g	4.5	30	10-JUL-19
<b>WG3099966-4 LCS</b>								
Antimony (Sb)			116.6		%		80-120	10-JUL-19
Arsenic (As)			113.0		%		80-120	10-JUL-19
Barium (Ba)			114.1		%		80-120	10-JUL-19
Beryllium (Be)			109.1		%		80-120	10-JUL-19
Boron (B)			105.6		%		80-120	10-JUL-19
Cadmium (Cd)			109.0		%		80-120	10-JUL-19
Chromium (Cr)			113.9		%		80-120	10-JUL-19
Cobalt (Co)			112.3		%		80-120	10-JUL-19

COMMENTS: Silver in LCS is outside of ALS DQOs due to issue with standard. CRM values were within acceptable DQO. Reported Silver



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-200.2-CCMS-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4704052</b>							
<b>WG3099966-4</b>	<b>LCS</b>							
Copper (Cu)			109.9		%		80-120	10-JUL-19
Lead (Pb)			108.7		%		80-120	10-JUL-19
Molybdenum (Mo)			116.0		%		80-120	10-JUL-19
Nickel (Ni)			111.9		%		80-120	10-JUL-19
Selenium (Se)			111.5		%		80-120	10-JUL-19
Silver (Ag)			64.7	RRQC	%		80-120	10-JUL-19
Thallium (Tl)			110.4		%		80-120	10-JUL-19
Uranium (U)			115.1		%		80-120	10-JUL-19
Vanadium (V)			115.7		%		80-120	10-JUL-19
Zinc (Zn)			108.7		%		80-120	10-JUL-19
COMMENTS: Silver in LCS is outside of ALS DQOs due to issue with standard. CRM values were within acceptable DQO. Reported Silver data is not effected.								
<b>WG3099966-1</b>	<b>MB</b>							
Antimony (Sb)			<0.10		mg/kg		0.1	10-JUL-19
Arsenic (As)			<0.10		mg/kg		0.1	10-JUL-19
Barium (Ba)			<0.50		mg/kg		0.5	10-JUL-19
Beryllium (Be)			<0.10		mg/kg		0.1	10-JUL-19
Boron (B)			<5.0		mg/kg		5	10-JUL-19
Cadmium (Cd)			<0.020		mg/kg		0.02	10-JUL-19
Chromium (Cr)			<0.50		mg/kg		0.5	10-JUL-19
Cobalt (Co)			<0.10		mg/kg		0.1	10-JUL-19
Copper (Cu)			<0.50		mg/kg		0.5	10-JUL-19
Lead (Pb)			<0.50		mg/kg		0.5	10-JUL-19
Molybdenum (Mo)			<0.10		mg/kg		0.1	10-JUL-19
Nickel (Ni)			<0.50		mg/kg		0.5	10-JUL-19
Selenium (Se)			<0.20		mg/kg		0.2	10-JUL-19
Silver (Ag)			<0.10		mg/kg		0.1	10-JUL-19
Thallium (Tl)			<0.050		mg/kg		0.05	10-JUL-19
Uranium (U)			<0.050		mg/kg		0.05	10-JUL-19
Vanadium (V)			<0.20		mg/kg		0.2	10-JUL-19
Zinc (Zn)			<2.0		mg/kg		2	10-JUL-19

**MOISTURE-WT**                      **Soil**



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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MOISTURE-WT</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4694321</b>							
<b>WG3096028-3</b>	<b>DUP</b>	<b>L2303258-5</b>						
% Moisture		20.0	20.0		%	0.3	20	05-JUL-19
<b>WG3096028-2</b>	<b>LCS</b>							
% Moisture			100.2		%		90-110	05-JUL-19
<b>WG3096028-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.1	05-JUL-19
<b>Batch</b>	<b>R4694324</b>							
<b>WG3096039-3</b>	<b>DUP</b>	<b>L2302231-12</b>						
% Moisture		18.2	17.5		%	3.9	20	05-JUL-19
<b>WG3096039-2</b>	<b>LCS</b>							
% Moisture			96.7		%		90-110	05-JUL-19
<b>WG3096039-1</b>	<b>MB</b>							
% Moisture			<0.10		%		0.1	05-JUL-19
<b>PAH-511-WT</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4701650</b>							
<b>WG3096443-3</b>	<b>DUP</b>	<b>WG3096443-5</b>						
1-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	09-JUL-19
2-Methylnaphthalene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	09-JUL-19
Acenaphthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Acenaphthylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Benzo(a)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Benzo(a)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Benzo(b)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Benzo(g,h,i)perylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Benzo(k)fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Chrysene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Dibenzo(ah)anthracene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Fluoranthene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Fluorene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Indeno(1,2,3-cd)pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
Naphthalene		<0.013	<0.013	RPD-NA	ug/g	N/A	40	09-JUL-19
Phenanthrene		<0.046	<0.046	RPD-NA	ug/g	N/A	40	09-JUL-19
Pyrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	09-JUL-19
<b>WG3096443-2</b>	<b>LCS</b>							



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PAH-511-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4701650</b>							
<b>WG3096443-2 LCS</b>								
1-Methylnaphthalene			99.2		%		50-140	09-JUL-19
2-Methylnaphthalene			94.4		%		50-140	09-JUL-19
Acenaphthene			99.8		%		50-140	09-JUL-19
Acenaphthylene			98.1		%		50-140	09-JUL-19
Anthracene			97.9		%		50-140	09-JUL-19
Benzo(a)anthracene			100.3		%		50-140	09-JUL-19
Benzo(a)pyrene			99.6		%		50-140	09-JUL-19
Benzo(b)fluoranthene			104.6		%		50-140	09-JUL-19
Benzo(g,h,i)perylene			104.5		%		50-140	09-JUL-19
Benzo(k)fluoranthene			100.6		%		50-140	09-JUL-19
Chrysene			107.7		%		50-140	09-JUL-19
Dibenzo(ah)anthracene			104.8		%		50-140	09-JUL-19
Fluoranthene			96.8		%		50-140	09-JUL-19
Fluorene			97.4		%		50-140	09-JUL-19
Indeno(1,2,3-cd)pyrene			101.1		%		50-140	09-JUL-19
Naphthalene			97.8		%		50-140	09-JUL-19
Phenanthrene			101.6		%		50-140	09-JUL-19
Pyrene			97.4		%		50-140	09-JUL-19
<b>WG3096443-1 MB</b>								
1-Methylnaphthalene			<0.030		ug/g		0.03	09-JUL-19
2-Methylnaphthalene			<0.030		ug/g		0.03	09-JUL-19
Acenaphthene			<0.050		ug/g		0.05	09-JUL-19
Acenaphthylene			<0.050		ug/g		0.05	09-JUL-19
Anthracene			<0.050		ug/g		0.05	09-JUL-19
Benzo(a)anthracene			<0.050		ug/g		0.05	09-JUL-19
Benzo(a)pyrene			<0.050		ug/g		0.05	09-JUL-19
Benzo(b)fluoranthene			<0.050		ug/g		0.05	09-JUL-19
Benzo(g,h,i)perylene			<0.050		ug/g		0.05	09-JUL-19
Benzo(k)fluoranthene			<0.050		ug/g		0.05	09-JUL-19
Chrysene			<0.050		ug/g		0.05	09-JUL-19
Dibenzo(ah)anthracene			<0.050		ug/g		0.05	09-JUL-19
Fluoranthene			<0.050		ug/g		0.05	09-JUL-19
Fluorene			<0.050		ug/g		0.05	09-JUL-19
Indeno(1,2,3-cd)pyrene			<0.050		ug/g		0.05	09-JUL-19



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PAH-511-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4701650</b>							
<b>WG3096443-1 MB</b>								
Naphthalene			<0.013		ug/g		0.013	09-JUL-19
Phenanthrene			<0.046		ug/g		0.046	09-JUL-19
Pyrene			<0.050		ug/g		0.05	09-JUL-19
Surrogate: 2-Fluorobiphenyl			94.3		%		50-140	09-JUL-19
Surrogate: p-Terphenyl d14			82.1		%		50-140	09-JUL-19
<b>WG3096443-4 MS</b>		<b>WG3096443-5</b>						
1-Methylnaphthalene			98.1		%		50-140	09-JUL-19
2-Methylnaphthalene			92.9		%		50-140	09-JUL-19
Acenaphthene			98.5		%		50-140	09-JUL-19
Acenaphthylene			96.3		%		50-140	09-JUL-19
Anthracene			98.8		%		50-140	09-JUL-19
Benzo(a)anthracene			100.7		%		50-140	09-JUL-19
Benzo(a)pyrene			100.1		%		50-140	09-JUL-19
Benzo(b)fluoranthene			104.9		%		50-140	09-JUL-19
Benzo(g,h,i)perylene			102.3		%		50-140	09-JUL-19
Benzo(k)fluoranthene			102.0		%		50-140	09-JUL-19
Chrysene			107.5		%		50-140	09-JUL-19
Dibenzo(ah)anthracene			103.4		%		50-140	09-JUL-19
Fluoranthene			97.4		%		50-140	09-JUL-19
Fluorene			96.0		%		50-140	09-JUL-19
Indeno(1,2,3-cd)pyrene			99.5		%		50-140	09-JUL-19
Naphthalene			95.5		%		50-140	09-JUL-19
Phenanthrene			101.1		%		50-140	09-JUL-19
Pyrene			98.1		%		50-140	09-JUL-19
<b>PH-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4711859</b>							
<b>WG3102941-1 DUP</b>		<b>L2308613-1</b>						
pH		5.32	5.25	J	pH units	0.07	0.3	15-JUL-19
<b>WG3105163-1 LCS</b>								
pH			7.01		pH units		6.9-7.1	15-JUL-19
<b>VOC-511-HS-WT</b>	<b>Soil</b>							



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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-4</b>	<b>DUP</b>	<b>WG3099516-3</b>						
1,1,1,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,1,2,2-Tetrachloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,1,1-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,1,2-Trichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,1-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,1-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,2-Dibromoethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,2-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,2-Dichloroethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,2-Dichloropropane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,3-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
1,4-Dichlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Acetone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	11-JUL-19
Benzene		<0.0068	<0.0068	RPD-NA	ug/g	N/A	40	11-JUL-19
Bromodichloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Bromoform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Bromomethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Carbon tetrachloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Chlorobenzene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Chloroform		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
cis-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
cis-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	11-JUL-19
Dibromochloromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Dichlorodifluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Ethylbenzene		<0.018	<0.018	RPD-NA	ug/g	N/A	40	11-JUL-19
n-Hexane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Methylene Chloride		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
MTBE		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
m+p-Xylenes		<0.030	<0.030	RPD-NA	ug/g	N/A	40	11-JUL-19
Methyl Ethyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	11-JUL-19
Methyl Isobutyl Ketone		<0.50	<0.50	RPD-NA	ug/g	N/A	40	11-JUL-19
o-Xylene		<0.020	<0.020	RPD-NA	ug/g	N/A	40	11-JUL-19
Styrene		<0.050	<0.050		ug/g			11-JUL-19



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Soil</b>							
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-4</b>	<b>DUP</b>	<b>WG3099516-3</b>						
Styrene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Tetrachloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Toluene		<0.080	<0.080	RPD-NA	ug/g	N/A	40	11-JUL-19
trans-1,2-Dichloroethylene		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
trans-1,3-Dichloropropene		<0.030	<0.030	RPD-NA	ug/g	N/A	40	11-JUL-19
Trichloroethylene		<0.010	<0.010	RPD-NA	ug/g	N/A	40	11-JUL-19
Trichlorofluoromethane		<0.050	<0.050	RPD-NA	ug/g	N/A	40	11-JUL-19
Vinyl chloride		<0.020	<0.020	RPD-NA	ug/g	N/A	40	11-JUL-19
<b>WG3099516-2</b>	<b>LCS</b>							
1,1,1,2-Tetrachloroethane			103.2		%		60-130	11-JUL-19
1,1,2,2-Tetrachloroethane			105.5		%		60-130	11-JUL-19
1,1,1-Trichloroethane			100.9		%		60-130	11-JUL-19
1,1,2-Trichloroethane			109.1		%		60-130	11-JUL-19
1,1-Dichloroethane			109.7		%		60-130	11-JUL-19
1,1-Dichloroethylene			100.1		%		60-130	11-JUL-19
1,2-Dibromoethane			112.6		%		70-130	11-JUL-19
1,2-Dichlorobenzene			104.0		%		70-130	11-JUL-19
1,2-Dichloroethane			109.8		%		60-130	11-JUL-19
1,2-Dichloropropane			106.1		%		70-130	11-JUL-19
1,3-Dichlorobenzene			97.1		%		70-130	11-JUL-19
1,4-Dichlorobenzene			96.7		%		70-130	11-JUL-19
Acetone			123.3		%		60-140	11-JUL-19
Benzene			107.9		%		70-130	11-JUL-19
Bromodichloromethane			106.8		%		50-140	11-JUL-19
Bromoform			110.9		%		70-130	11-JUL-19
Bromomethane			125.9		%		50-140	11-JUL-19
Carbon tetrachloride			99.2		%		70-130	11-JUL-19
Chlorobenzene			105.0		%		70-130	11-JUL-19
Chloroform			107.9		%		70-130	11-JUL-19
cis-1,2-Dichloroethylene			103.7		%		70-130	11-JUL-19
cis-1,3-Dichloropropene			105.8		%		70-130	11-JUL-19
Dibromochloromethane			106.3		%		60-130	11-JUL-19
Dichlorodifluoromethane			92.3		%		50-140	11-JUL-19



### Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Soil</b>						
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-2</b>	<b>LCS</b>							
Ethylbenzene			91.1		%		70-130	11-JUL-19
n-Hexane			96.0		%		70-130	11-JUL-19
Methylene Chloride			113.0		%		70-130	11-JUL-19
MTBE			101.9		%		70-130	11-JUL-19
m+p-Xylenes			94.3		%		70-130	11-JUL-19
Methyl Ethyl Ketone			102.6		%		60-140	11-JUL-19
Methyl Isobutyl Ketone			98.1		%		60-140	11-JUL-19
o-Xylene			93.6		%		70-130	11-JUL-19
Styrene			96.0		%		70-130	11-JUL-19
Tetrachloroethylene			96.2		%		60-130	11-JUL-19
Toluene			96.8		%		70-130	11-JUL-19
trans-1,2-Dichloroethylene			108.0		%		60-130	11-JUL-19
trans-1,3-Dichloropropene			108.1		%		70-130	11-JUL-19
Trichloroethylene			105.4		%		60-130	11-JUL-19
Trichlorofluoromethane			104.5		%		50-140	11-JUL-19
Vinyl chloride			90.7		%		60-140	11-JUL-19
<b>WG3099516-1</b>	<b>MB</b>							
1,1,1,2-Tetrachloroethane			<0.050		ug/g		0.05	11-JUL-19
1,1,2,2-Tetrachloroethane			<0.050		ug/g		0.05	11-JUL-19
1,1,1-Trichloroethane			<0.050		ug/g		0.05	11-JUL-19
1,1,2-Trichloroethane			<0.050		ug/g		0.05	11-JUL-19
1,1-Dichloroethane			<0.050		ug/g		0.05	11-JUL-19
1,1-Dichloroethylene			<0.050		ug/g		0.05	11-JUL-19
1,2-Dibromoethane			<0.050		ug/g		0.05	11-JUL-19
1,2-Dichlorobenzene			<0.050		ug/g		0.05	11-JUL-19
1,2-Dichloroethane			<0.050		ug/g		0.05	11-JUL-19
1,2-Dichloropropane			<0.050		ug/g		0.05	11-JUL-19
1,3-Dichlorobenzene			<0.050		ug/g		0.05	11-JUL-19
1,4-Dichlorobenzene			<0.050		ug/g		0.05	11-JUL-19
Acetone			<0.50		ug/g		0.5	11-JUL-19
Benzene			<0.0068		ug/g		0.0068	11-JUL-19
Bromodichloromethane			<0.050		ug/g		0.05	11-JUL-19
Bromoform			<0.050		ug/g		0.05	11-JUL-19
Bromomethane			<0.050		ug/g		0.05	11-JUL-19



## Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-1 MB</b>								
Carbon tetrachloride			<0.050		ug/g		0.05	11-JUL-19
Chlorobenzene			<0.050		ug/g		0.05	11-JUL-19
Chloroform			<0.050		ug/g		0.05	11-JUL-19
cis-1,2-Dichloroethylene			<0.050		ug/g		0.05	11-JUL-19
cis-1,3-Dichloropropene			<0.030		ug/g		0.03	11-JUL-19
Dibromochloromethane			<0.050		ug/g		0.05	11-JUL-19
Dichlorodifluoromethane			<0.050		ug/g		0.05	11-JUL-19
Ethylbenzene			<0.018		ug/g		0.018	11-JUL-19
n-Hexane			<0.050		ug/g		0.05	11-JUL-19
Methylene Chloride			<0.050		ug/g		0.05	11-JUL-19
MTBE			<0.050		ug/g		0.05	11-JUL-19
m+p-Xylenes			<0.030		ug/g		0.03	11-JUL-19
Methyl Ethyl Ketone			<0.50		ug/g		0.5	11-JUL-19
Methyl Isobutyl Ketone			<0.50		ug/g		0.5	11-JUL-19
o-Xylene			<0.020		ug/g		0.02	11-JUL-19
Styrene			<0.050		ug/g		0.05	11-JUL-19
Tetrachloroethylene			<0.050		ug/g		0.05	11-JUL-19
Toluene			<0.080		ug/g		0.08	11-JUL-19
trans-1,2-Dichloroethylene			<0.050		ug/g		0.05	11-JUL-19
trans-1,3-Dichloropropene			<0.030		ug/g		0.03	11-JUL-19
Trichloroethylene			<0.010		ug/g		0.01	11-JUL-19
Trichlorofluoromethane			<0.050		ug/g		0.05	11-JUL-19
Vinyl chloride			<0.020		ug/g		0.02	11-JUL-19
Surrogate: 1,4-Difluorobenzene			103.3		%		50-140	11-JUL-19
Surrogate: 4-Bromofluorobenzene			86.2		%		50-140	11-JUL-19
<b>WG3099516-5 MS</b>		<b>L2303880-1</b>						
1,1,1,2-Tetrachloroethane			106.6		%		50-140	11-JUL-19
1,1,2,2-Tetrachloroethane			105.5		%		50-140	11-JUL-19
1,1,1-Trichloroethane			105.6		%		50-140	11-JUL-19
1,1,2-Trichloroethane			111.1		%		50-140	11-JUL-19
1,1-Dichloroethane			113.7		%		50-140	11-JUL-19
1,1-Dichloroethylene			105.6		%		50-140	11-JUL-19
1,2-Dibromoethane			114.6		%		50-140	11-JUL-19
1,2-Dichlorobenzene			107.3		%		50-140	11-JUL-19

## Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>	<b>Soil</b>							
<b>Batch</b>	<b>R4706968</b>							
<b>WG3099516-5 MS</b>		<b>L2303880-1</b>						
1,2-Dichloroethane			110.7		%		50-140	11-JUL-19
1,2-Dichloropropane			108.9		%		50-140	11-JUL-19
1,3-Dichlorobenzene			100.2		%		50-140	11-JUL-19
1,4-Dichlorobenzene			99.5		%		50-140	11-JUL-19
Acetone			126.0		%		50-140	11-JUL-19
Benzene			111.6		%		50-140	11-JUL-19
Bromodichloromethane			108.6		%		50-140	11-JUL-19
Bromoform			111.6		%		50-140	11-JUL-19
Bromomethane			128.7		%		50-140	11-JUL-19
Carbon tetrachloride			104.1		%		50-140	11-JUL-19
Chlorobenzene			108.5		%		50-140	11-JUL-19
Chloroform			111.2		%		50-140	11-JUL-19
cis-1,2-Dichloroethylene			106.9		%		50-140	11-JUL-19
cis-1,3-Dichloropropene			103.1		%		50-140	11-JUL-19
Dibromochloromethane			108.5		%		50-140	11-JUL-19
Dichlorodifluoromethane			108.7		%		50-140	11-JUL-19
Ethylbenzene			95.1		%		50-140	11-JUL-19
n-Hexane			103.9		%		50-140	11-JUL-19
Methylene Chloride			114.4		%		50-140	11-JUL-19
MTBE			104.9		%		50-140	11-JUL-19
m+p-Xylenes			97.9		%		50-140	11-JUL-19
Methyl Ethyl Ketone			96.9		%		50-140	11-JUL-19
Methyl Isobutyl Ketone			97.4		%		50-140	11-JUL-19
o-Xylene			97.4		%		50-140	11-JUL-19
Styrene			98.6		%		50-140	11-JUL-19
Tetrachloroethylene			99.95		%		50-140	11-JUL-19
Toluene			100.9		%		50-140	11-JUL-19
trans-1,2-Dichloroethylene			111.6		%		50-140	11-JUL-19
trans-1,3-Dichloropropene			104.6		%		50-140	11-JUL-19
Trichloroethylene			109.4		%		50-140	11-JUL-19
Trichlorofluoromethane			111.9		%		50-140	11-JUL-19
Vinyl chloride			97.0		%		50-140	11-JUL-19

# Quality Control Report

Workorder: L2303880

Report Date: 15-OCT-19

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

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Contact: Pascal Renella

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

---

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.
RRQC	Refer to report remarks for information regarding this QC result.

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## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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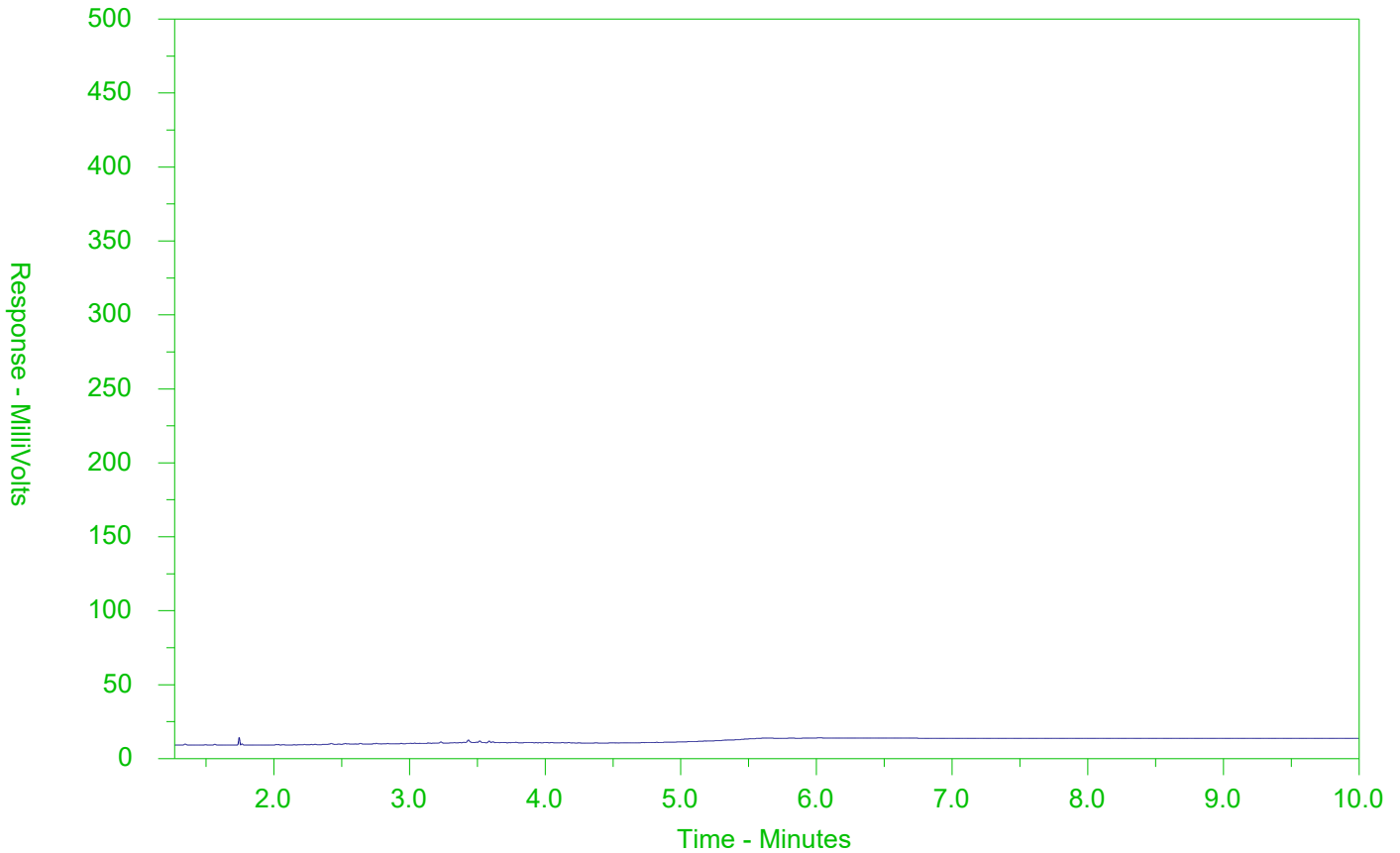
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-1  
 Client Sample ID: S-11196246-270619-BH3S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

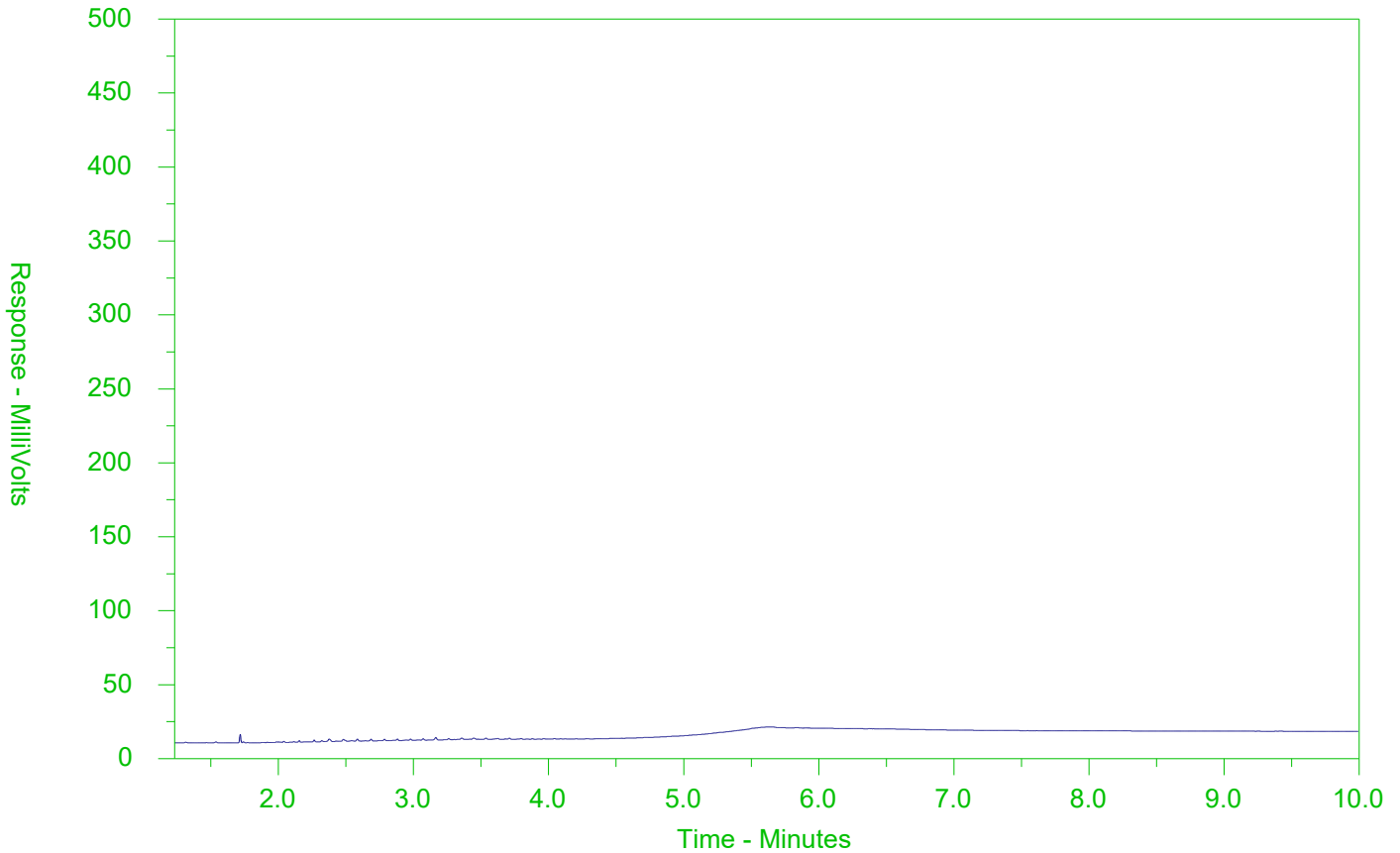
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-3  
 Client Sample ID: S-11196246-270619-BH4S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

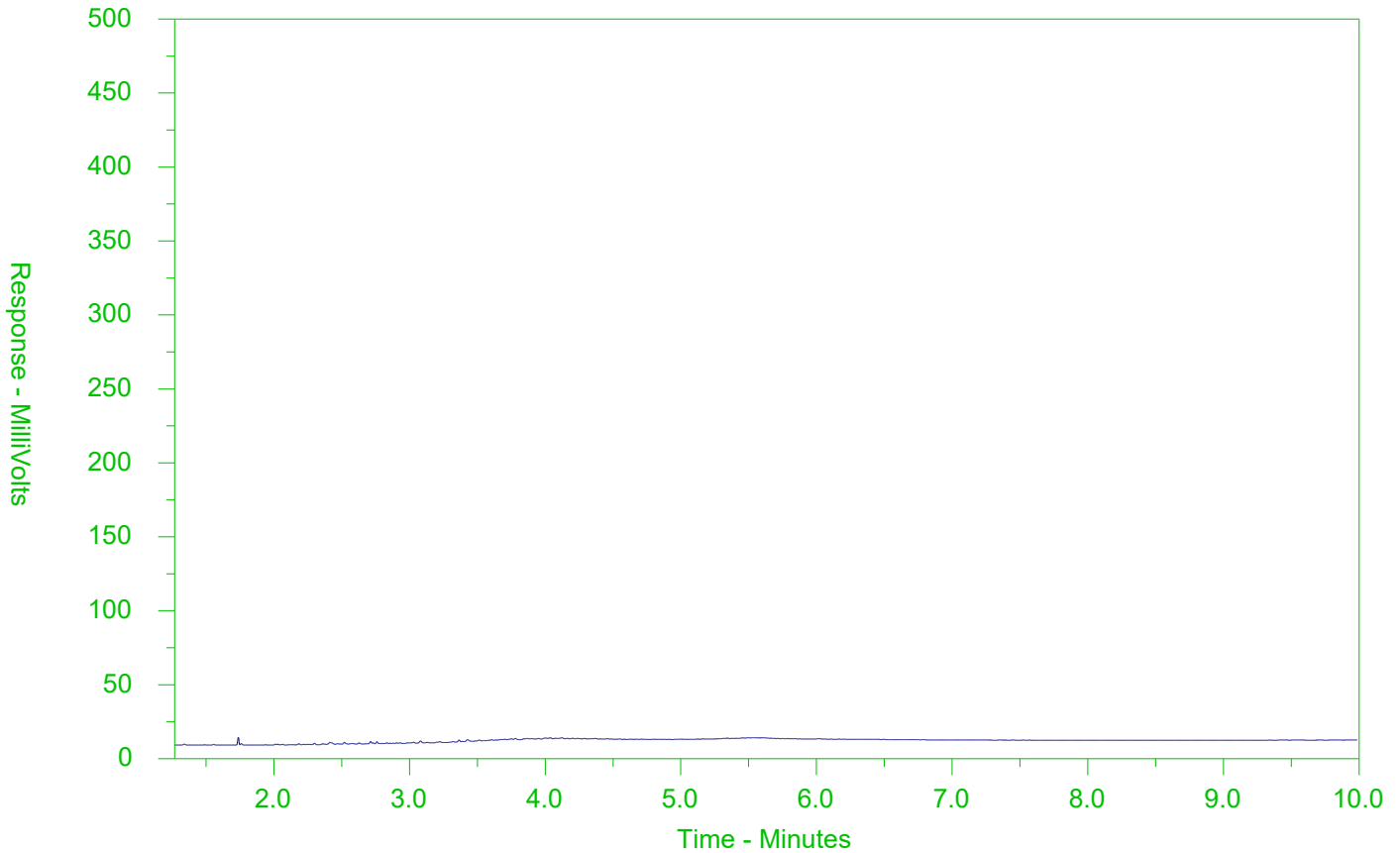
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-5  
 Client Sample ID: S-11196246-280619-MW2S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

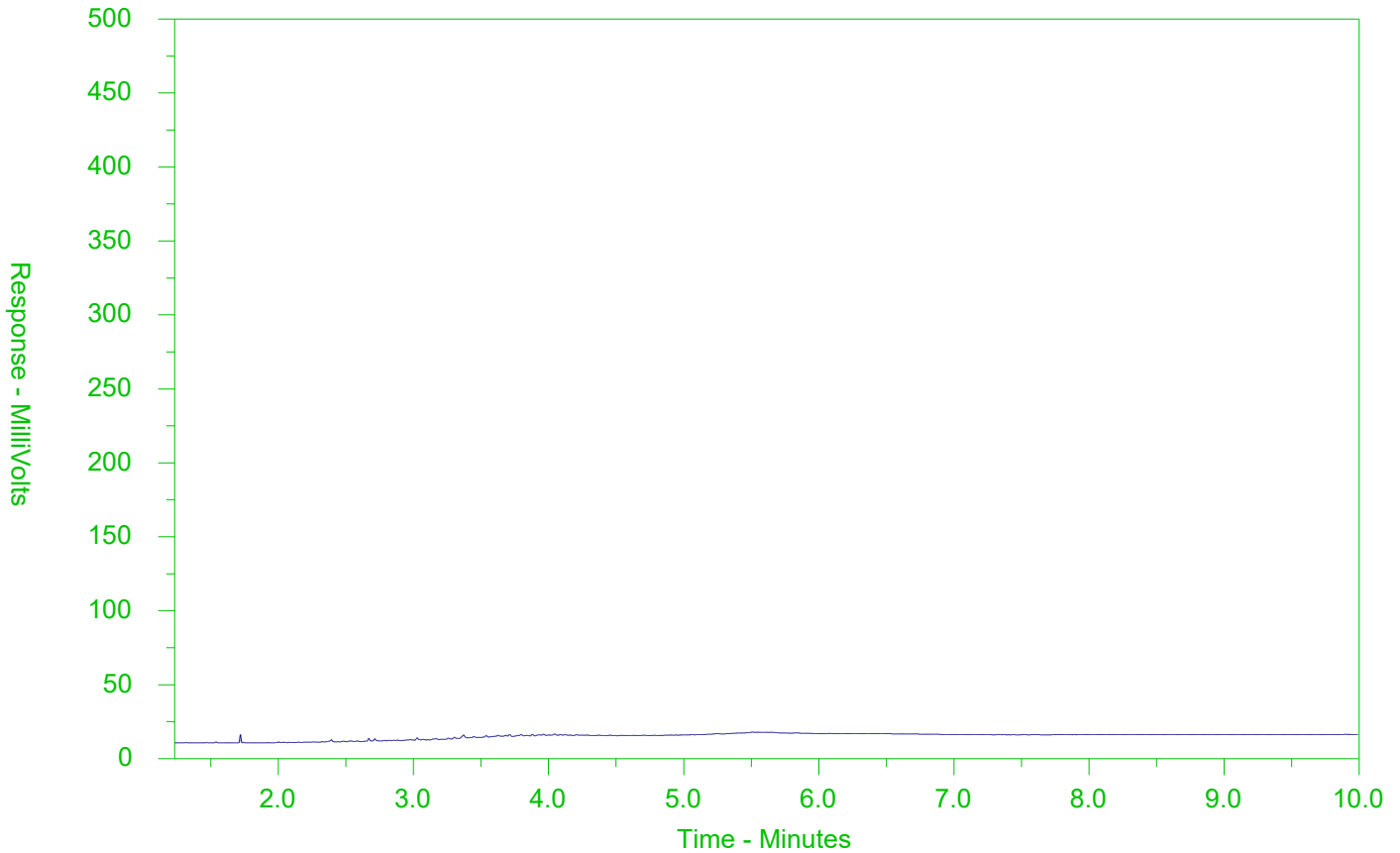
Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-6  
 Client Sample ID: S-11196246-280619-MW2S-99



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

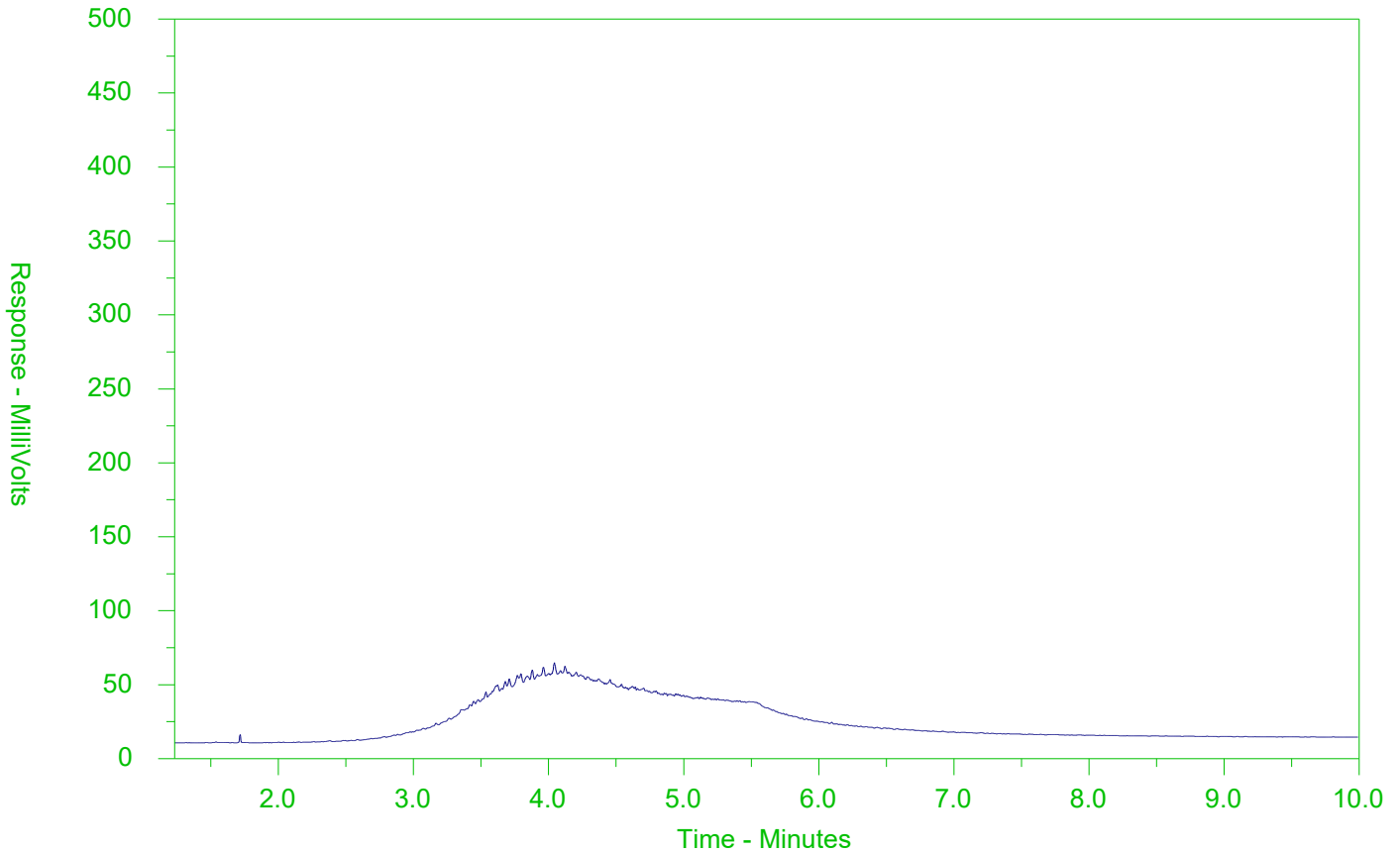
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-9  
 Client Sample ID: S-11196246-280619-MW1S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

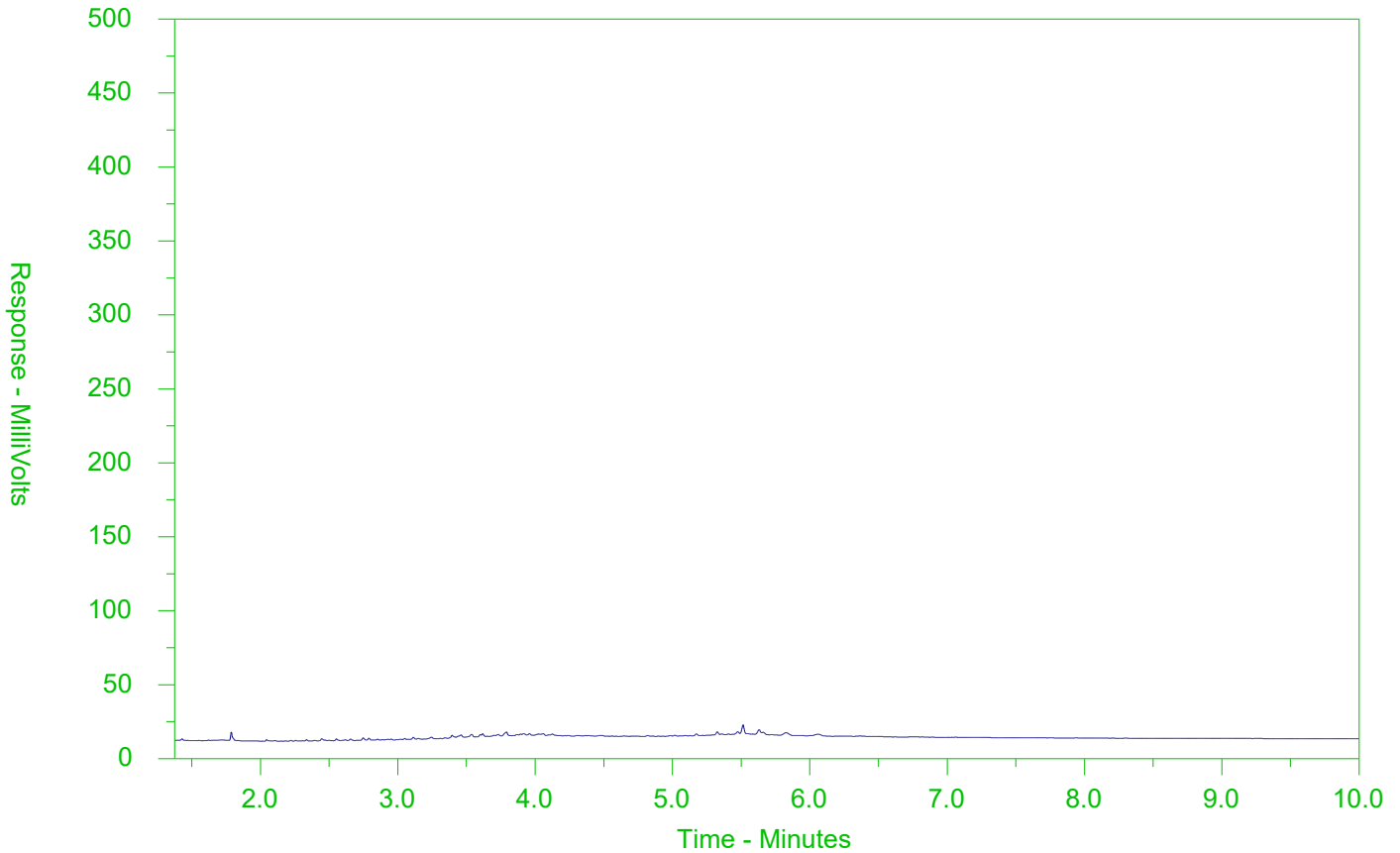
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-10  
 Client Sample ID: S-11196246-020719-BH1S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

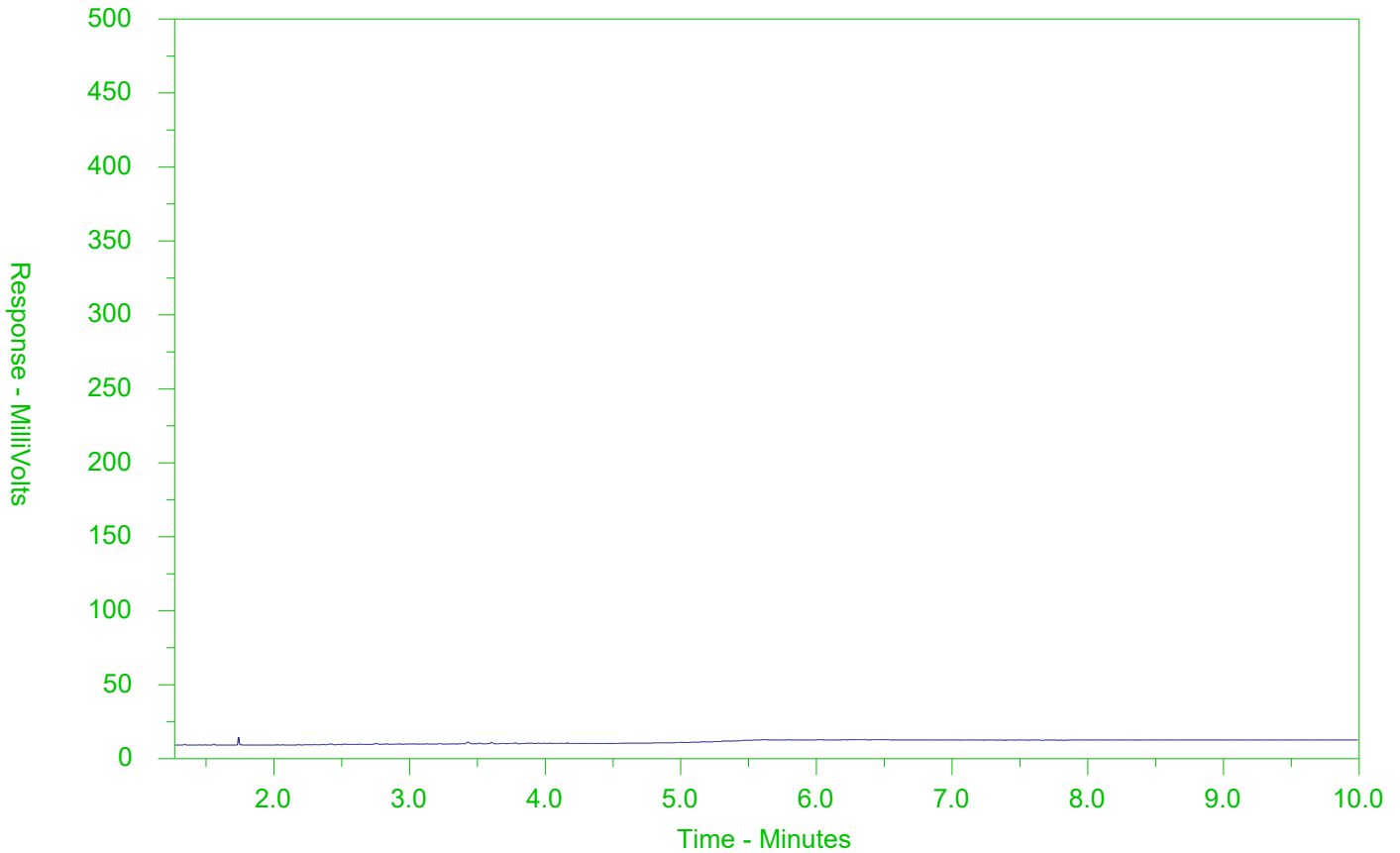
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-12  
 Client Sample ID: S-11196246-030719-MW5S



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

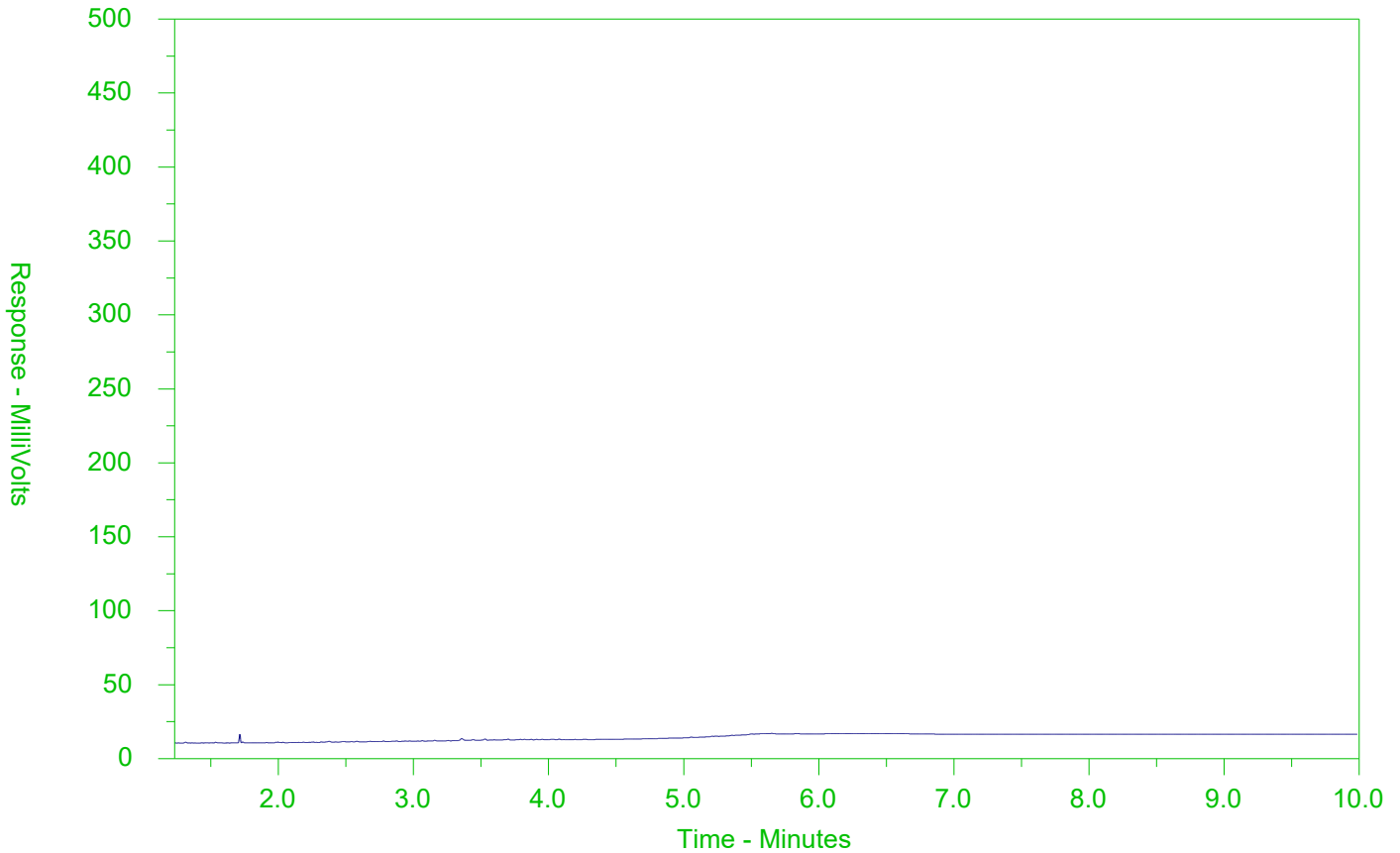
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-13  
 Client Sample ID: S-11196246-030719-MW5S-99



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

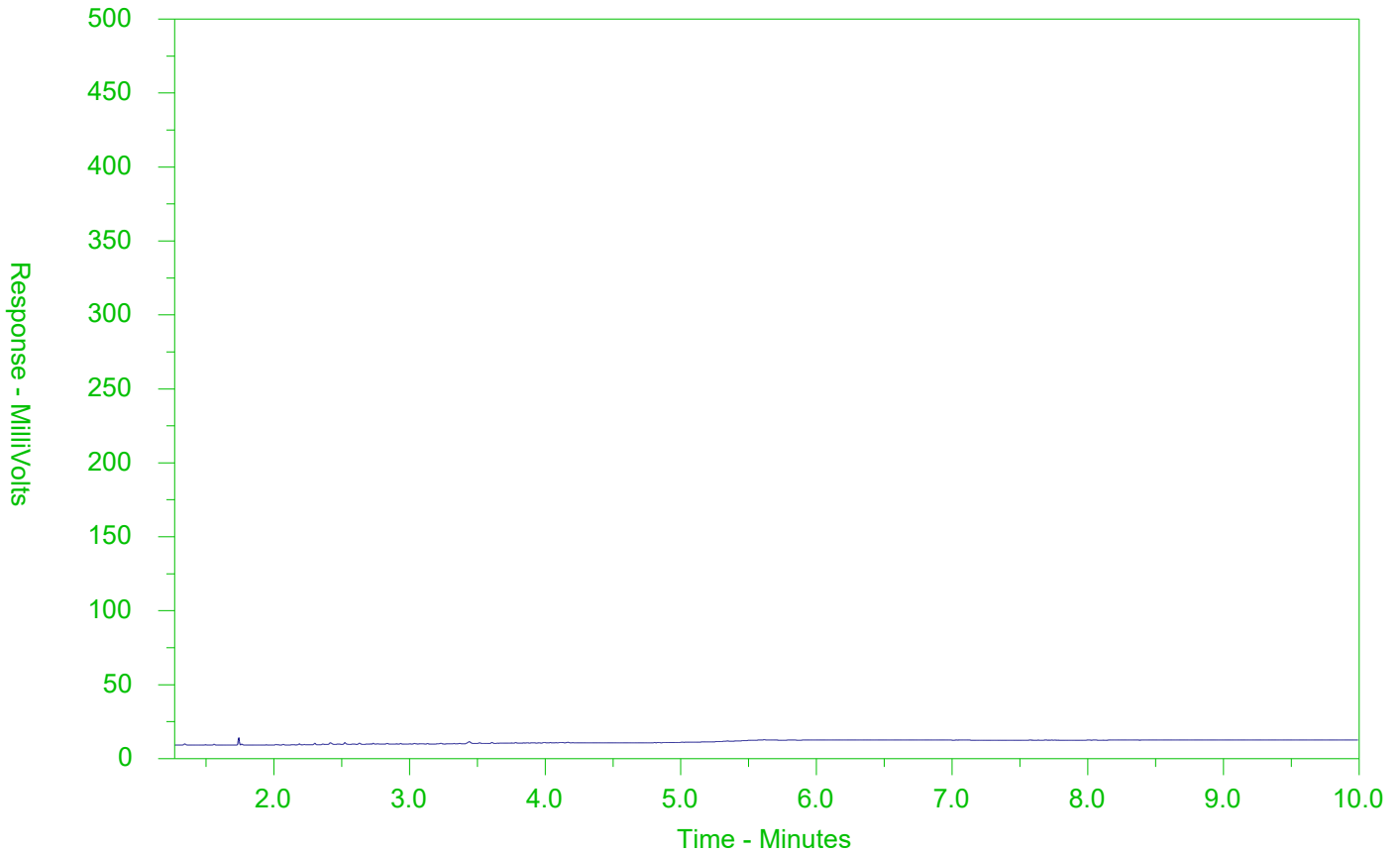
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2303880-15  
 Client Sample ID: S-11196246-030719-BH25



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



<b>Report To</b> <small>Contact and company name below will appear on the final report</small> Company: <b>GHD LIMITED - ACCT #13791</b> Contact: <b>Pascal Renella</b> Phone: <b>450-973-4165</b> <small>Company address below will appear on the final report</small> Street: <b>455 Phillip St</b> City/Province: <b>Waterloo, Ontario</b> Postal Code: <b>N2L 3X2</b>		<b>Report Format / Distribution</b> Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL) Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <b>pascal.renella@ghd.com</b> Email 2: <b>See PO</b> Email 3:		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b> Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply EMERGENCY 4 day [P4-20%] <input type="checkbox"/> <b>1 Business day [E - 100%]</b> <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> <b>Same Day, Weekend or Statutory holiday [E2 - 200%]</b> <input type="checkbox"/> (Laboratory opening fees may apply) ] Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																																																																																																						
<b>Invoice To</b> Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Company: <b>GHD Limited</b> Contact: <b>SEE SSOW</b>		<b>Invoice Distribution</b> Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: <b>apinvoices-735@ghd.com</b> Email 2:		<b>Analysis Request</b> Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</th> <th colspan="5"></th> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">SAMPLES ON HOLD</th> <th rowspan="2" style="writing-mode: vertical-rl; transform: rotate(180deg);">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>O, Reg Metals (Met, Hg, Cr6, HWSE)</th> <th>VOC, F1-F4-S11-P-WT</th> <th>PAH-S11-WT</th> <th>F1-F4-S11-P-WT</th> <th>VOC, F1 (Trip Blank)</th> </tr> <tr> <td>5</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>5</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td></td> <td></td> </tr> <tr> <td>5</td> <td>X</td> <td>X</td> <td>X</td> <td>X</td> <td></td> <td>X</td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td>X</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>		NUMBER OF CONTAINERS						SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	O, Reg Metals (Met, Hg, Cr6, HWSE)	VOC, F1-F4-S11-P-WT	PAH-S11-WT	F1-F4-S11-P-WT	VOC, F1 (Trip Blank)	5	X	X	X	X				5	X	X	X	X		X		5	X	X	X	X				5	X	X	X	X		X		1					X																																																																																		
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13	S-11196246-030719-MW AS-99	03-07-19	12:30	Soil	5	X	X	X																																																																																																																																		
14	S-11196246-030719-MW SD	03-07-19	12:45	Soil	5	X	X	X		X																																																																																																																																
15	S-11196246-030719-BH25	03-07-19	13:30	Soil	5	X	X	X																																																																																																																																		
16	S-11196246-030719-BH2D	03-07-19	13:45	Soil	5	X	X	X		X																																																																																																																																
17	S-11196246-030719-TRIP BLANK	03-07-19	14:00	Soil	1				X																																																																																																																																	
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<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b> Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>		<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b> Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: _____ FINAL COOLER TEMPERATURES °C: <b>5.8</b>																																																																																																																																						
<b>SHIPMENT RELEASE (client use)</b> Released by: <b>[Signature]</b> Date: <b>03/07/19</b> Time: <b>18:00</b>		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b> Received by: _____ Date: _____ Time: _____		<b>FINAL SHIPMENT RECEPTION (lab use only)</b> Received by: <b>[Signature]</b> Date: <b>8/20 July 4 2019</b> Time: _____																																																																																																																																						

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



L2303880-COFC

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>			<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>																																							
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF	<input checked="" type="checkbox"/> EXCEL	<input checked="" type="checkbox"/> EDD (DIGITAL)	<b>Regular [R]</b> <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply						<b>EMERGENCY</b>																																
Contact:	Pascal Renella	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			<b>4 day [P4-20%]</b> <input type="checkbox"/>		<b>1 Business day [E - 100%]</b> <input type="checkbox"/>																																				
Phone:	450-973-4165	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked				<b>3 day [P3-25%]</b> <input type="checkbox"/>		<b>Same Day, Weekend or Statutory holiday [E2 - 200%]</b> <input type="checkbox"/>																																				
Company address below will appear on the final report		Select Distribution:	<input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			<b>2 day [P2-50%]</b> <input type="checkbox"/>		<b>Same Day, Weekend or Statutory holiday [E2 - 200%]</b> <input type="checkbox"/>		<b>(Laboratory opening fees may apply)</b>																																		
Street:	455 Phillip St	Email 1 or Fax	pascal.renella@ghd.com			<b>Date and Time Required for all E&amp;P TATs:</b>						dd-mmm-yy hh:mm																																
City/Province:	Waterloo, Ontario	Email 2	See PO			For tests that can not be performed according to the service level selected, you will be contacted.																																						
Postal Code:	N2L 3X2	Email 3				<b>Analysis Request</b>																																						
<b>Invoice To</b>		<b>Invoice Distribution</b>			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																							
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																										
Copy of invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax apinvoices-735@ghd.com			<table border="1"> <tr> <th rowspan="2">NUMBER OF CONTAINERS</th> <th colspan="12">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below</th> <th rowspan="2">SAMPLES ON HOLD</th> <th rowspan="2">SUSPECTED HAZARD (see Special Instructions)</th> </tr> <tr> <th>O, Reg Metals (Met, Hg, Cr6, HWSB)</th> <th>VOC, F1-F4-511-P-WT</th> <th>PAH-511-WT</th> <th>F1-F4-511-P-WT</th> <th>VOC, F1 (Trip Blank)</th> <th></th><th></th><th></th><th></th><th></th><th></th><th></th><th></th> </tr> </table>												NUMBER OF CONTAINERS	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below												SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)	O, Reg Metals (Met, Hg, Cr6, HWSB)	VOC, F1-F4-511-P-WT	PAH-511-WT	F1-F4-511-P-WT	VOC, F1 (Trip Blank)								
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Company:	GHD Limited	Email 2			<p>1 5 X X X X</p> <p>2 5 X X X X</p> <p>3 4 X X</p> <p>4 4 X X</p> <p>5 5 X X X X</p> <p>6 5 X X X X</p> <p>7 5 X X X X</p> <p>8 5 X X X X</p> <p>9 5 X X X X</p> <p>10 6 X X X X</p> <p>11 5 X X X X</p> <p>12 5 X X X X</p>																																							
Contact:	SEE SSOV	Email 2			<p>please do not analyze -BH45 and -BH4D for VOCs</p>																																							
<b>Project Information</b>					<b>Oil and Gas Required Fields (client use)</b>																																							
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#																																									
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PO / AFE:		Requisitioner:																																										
LSD:		Location:																																										
ALS Lab Work Order # (lab use only): L2303880 MJ		ALS Contact:	Rick H		Sampler:																																							
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																							
1	S-11196246-270619-BH3S		27-Jun-19	10:30	Soil																																							
2	S-11196246-270619-BH3D		27-Jun-19	14:00	Soil																																							
3	S-11196246-270619-BH4S		27-Jun-19	10:30	Soil																																							
4	S-11196246-270619-BH4D		27-Jun-19	11:00	Soil																																							
5	S-11196246-280619-MW2S		28-Jun-19	13:45	Soil																																							
6	S-11196246-280619-MW2S-99		28-Jun-19	13:45	Soil																																							
7	S-11196246-280619-MW2D		28-Jun-19	12:30	Soil																																							
8	S-11196246-280619-MW1D		28-Jun-19	16:00	Soil																																							
9	S-11196246-280619-MW1S		28-Jun-19	15:45	Soil																																							
10	S-11196246-020719-BH1S		02-Jul-19	11:00	Soil																																							
11	S-11196246-020719-BH1D		02-Jul-19	11:30	Soil																																							
12	S-11196246-030719-MW5S		03-Jul-19	12:30	Soil																																							
<b>Drinking Water (DW) Samples (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>										<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>																																
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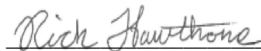
GHD Limited (Waterloo)  
ATTN: Pascal Renella  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Date Received: 08-JUL-19  
Report Date: 16-JUL-19 09:09 (MT)  
Version: FINAL

Client Phone: 450-973-4165

## Certificate of Analysis

Lab Work Order #: L2305757  
Project P.O. #: 73516171  
Job Reference: 11196246  
C of C Numbers: 17-822905  
Legal Site Desc:



Rick Hawthorne  
Account Manager

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ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-1 GW-11196246-070819-SO-MW3-19							
Sampled By: CLIENT on 08-JUL-19 @ 13:40							
Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					09-JUL-19	R4697749
Dissolved Metals Filtration Location	FIELD					09-JUL-19	R4697420
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Barium (Ba)-Dissolved	129	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Boron (B)-Dissolved	<100	DLHC	100	ug/L	09-JUL-19	10-JUL-19	R4706329
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	09-JUL-19	09-JUL-19	R4699188
Molybdenum (Mo)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Sodium (Na)-Dissolved	787000	DLHC	500	ug/L	09-JUL-19	10-JUL-19	R4706329
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Uranium (U)-Dissolved	0.59	DLHC	0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	09-JUL-19	10-JUL-19	R4706329
<b>Speciated Metals</b>							
Chromium, Hexavalent	1.68		0.50	ug/L		09-JUL-19	R4702350
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		15-JUL-19	R4710256
Benzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Bromodichloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Bromoform	<5.0		5.0	ug/L		15-JUL-19	R4710256
Bromomethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Carbon tetrachloride	<0.20		0.20	ug/L		15-JUL-19	R4710256
Chlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dibromochloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Chloroform	<1.0		1.0	ug/L		15-JUL-19	R4710256
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JUL-19	R4710256
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dichlorodifluoromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-1 GW-11196246-070819-SO-MW3-19							
Sampled By: CLIENT on 08-JUL-19 @ 13:40							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methylene Chloride	<5.0		5.0	ug/L		15-JUL-19	R4710256
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		15-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
n-Hexane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methyl Ethyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
Methyl Isobutyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
MTBE	<2.0		2.0	ug/L		15-JUL-19	R4710256
Styrene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Tetrachloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Toluene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichlorofluoromethane	<5.0		5.0	ug/L		15-JUL-19	R4710256
Vinyl chloride	<0.50		0.50	ug/L		15-JUL-19	R4710256
o-Xylene	<0.30		0.30	ug/L		15-JUL-19	R4710256
m+p-Xylenes	<0.40		0.40	ug/L		15-JUL-19	R4710256
Xylenes (Total)	<0.50		0.50	ug/L		15-JUL-19	
Surrogate: 4-Bromofluorobenzene	97.3		70-130	%		15-JUL-19	R4710256
Surrogate: 1,4-Difluorobenzene	101.7		70-130	%		15-JUL-19	R4710256
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25	VOCHS	25	ug/L		16-JUL-19	R4712341
F1-BTEX	<25		25	ug/L		16-JUL-19	
F2 (C10-C16)	<100		100	ug/L	08-JUL-19	09-JUL-19	R4701010
F2-Naphth	<100		100	ug/L		16-JUL-19	
F3 (C16-C34)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
F3-PAH	<250		250	ug/L		16-JUL-19	
F4 (C34-C50)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
Total Hydrocarbons (C6-C50)	<370		370	ug/L		16-JUL-19	
Chrom. to baseline at nC50	YES				08-JUL-19	09-JUL-19	R4701010
Surrogate: 2-Bromobenzotrifluoride	75.8		60-140	%	08-JUL-19	09-JUL-19	R4701010
Surrogate: 3,4-Dichlorotoluene	73.4		60-140	%		16-JUL-19	R4712341
<b>Polycyclic Aromatic Hydrocarbons</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-1 GW-11196246-070819-SO-MW3-19 Sampled By: CLIENT on 08-JUL-19 @ 13:40 Matrix: WATER							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Acenaphthylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)pyrene	<0.010		0.010	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(b)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(k)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Chrysene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluorene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-JUL-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
2-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Naphthalene	<0.050		0.050	ug/L	08-JUL-19	12-JUL-19	R4708722
Phenanthrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Acenaphthene	98.5		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d12-Chrysene	92.9		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d8-Naphthalene	102.3		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Phenanthrene	101.1		60-140	%	08-JUL-19	12-JUL-19	R4708722
L2305757-2 GW-11196246-070819-SO-MW100 Sampled By: CLIENT on 08-JUL-19 @ 13:40 Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					09-JUL-19	R4697749
Dissolved Metals Filtration Location	FIELD					09-JUL-19	R4697420
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Barium (Ba)-Dissolved	131	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Boron (B)-Dissolved	<100	DLHC	100	ug/L	09-JUL-19	10-JUL-19	R4706329
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	09-JUL-19	09-JUL-19	R4699188
Molybdenum (Mo)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-2 GW-11196246-070819-SO-MW100							
Sampled By: CLIENT on 08-JUL-19 @ 13:40							
Matrix: WATER							
<b>Dissolved Metals</b>							
Selenium (Se)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Sodium (Na)-Dissolved	807000	DLHC	500	ug/L	09-JUL-19	10-JUL-19	R4706329
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Uranium (U)-Dissolved	0.59	DLHC	0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	09-JUL-19	10-JUL-19	R4706329
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	09-JUL-19	10-JUL-19	R4706329
<b>Speciated Metals</b>							
Chromium, Hexavalent	1.63		0.50	ug/L		09-JUL-19	R4702350
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		15-JUL-19	R4710256
Benzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Bromodichloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Bromoform	<5.0		5.0	ug/L		15-JUL-19	R4710256
Bromomethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Carbon tetrachloride	<0.20		0.20	ug/L		15-JUL-19	R4710256
Chlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dibromochloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Chloroform	<1.0		1.0	ug/L		15-JUL-19	R4710256
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JUL-19	R4710256
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dichlorodifluoromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methylene Chloride	<5.0		5.0	ug/L		15-JUL-19	R4710256
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		15-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
n-Hexane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methyl Ethyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
Methyl Isobutyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
MTBE	<2.0		2.0	ug/L		15-JUL-19	R4710256
Styrene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-2 GW-11196246-070819-SO-MW100							
Sampled By: CLIENT on 08-JUL-19 @ 13:40							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Tetrachloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Toluene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichlorofluoromethane	<5.0		5.0	ug/L		15-JUL-19	R4710256
Vinyl chloride	<0.50		0.50	ug/L		15-JUL-19	R4710256
o-Xylene	<0.30		0.30	ug/L		15-JUL-19	R4710256
m+p-Xylenes	<0.40		0.40	ug/L		15-JUL-19	R4710256
Xylenes (Total)	<0.50		0.50	ug/L		15-JUL-19	
Surrogate: 4-Bromofluorobenzene	98.3		70-130	%		15-JUL-19	R4710256
Surrogate: 1,4-Difluorobenzene	101.8		70-130	%		15-JUL-19	R4710256
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25	VOCHS	25	ug/L		16-JUL-19	R4712341
F1-BTEX	<25		25	ug/L		16-JUL-19	
F2 (C10-C16)	<100		100	ug/L	08-JUL-19	09-JUL-19	R4701010
F2-Naphth	<100		100	ug/L		16-JUL-19	
F3 (C16-C34)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
F3-PAH	<250		250	ug/L		16-JUL-19	
F4 (C34-C50)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
Total Hydrocarbons (C6-C50)	<370		370	ug/L		16-JUL-19	
Chrom. to baseline at nC50	YES				08-JUL-19	09-JUL-19	R4701010
Surrogate: 2-Bromobenzotrifluoride	79.3		60-140	%	08-JUL-19	09-JUL-19	R4701010
Surrogate: 3,4-Dichlorotoluene	83.7		60-140	%		16-JUL-19	R4712341
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Acenaphthylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)pyrene	<0.010		0.010	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(b)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(k)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Chrysene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluorene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-JUL-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-2 GW-11196246-070819-SO-MW100 Sampled By: CLIENT on 08-JUL-19 @ 13:40 Matrix: WATER							
<b>Polycyclic Aromatic Hydrocarbons</b>							
2-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Naphthalene	<0.050		0.050	ug/L	08-JUL-19	12-JUL-19	R4708722
Phenanthrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Acenaphthene	92.9		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d12-Chrysene	86.7		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d8-Naphthalene	94.9		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Phenanthrene	91.8		60-140	%	08-JUL-19	12-JUL-19	R4708722
L2305757-3 GW-11196246-070819-SO-MW1-19 Sampled By: CLIENT on 08-JUL-19 @ 15:45 Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					09-JUL-19	R4697749
Dissolved Metals Filtration Location	FIELD					09-JUL-19	R4697420
Antimony (Sb)-Dissolved	<0.10		0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Arsenic (As)-Dissolved	0.13		0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Barium (Ba)-Dissolved	51.8		0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Beryllium (Be)-Dissolved	<0.10		0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Boron (B)-Dissolved	26		10	ug/L	09-JUL-19	10-JUL-19	R4706329
Cadmium (Cd)-Dissolved	<0.010		0.010	ug/L	09-JUL-19	10-JUL-19	R4706329
Chromium (Cr)-Dissolved	1.26		0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Cobalt (Co)-Dissolved	<0.10		0.10	ug/L	09-JUL-19	10-JUL-19	R4706329
Copper (Cu)-Dissolved	0.57		0.20	ug/L	09-JUL-19	10-JUL-19	R4706329
Lead (Pb)-Dissolved	<0.050		0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Mercury (Hg)-Dissolved	<0.010		0.010	ug/L	09-JUL-19	09-JUL-19	R4699188
Molybdenum (Mo)-Dissolved	0.186		0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Nickel (Ni)-Dissolved	<0.50		0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Selenium (Se)-Dissolved	1.93		0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Silver (Ag)-Dissolved	<0.050		0.050	ug/L	09-JUL-19	10-JUL-19	R4706329
Sodium (Na)-Dissolved	157000	DLHC	500	ug/L	09-JUL-19	10-JUL-19	R4706329
Thallium (Tl)-Dissolved	<0.010		0.010	ug/L	09-JUL-19	10-JUL-19	R4706329
Uranium (U)-Dissolved	0.274		0.010	ug/L	09-JUL-19	10-JUL-19	R4706329
Vanadium (V)-Dissolved	<0.50		0.50	ug/L	09-JUL-19	10-JUL-19	R4706329
Zinc (Zn)-Dissolved	1.1		1.0	ug/L	09-JUL-19	10-JUL-19	R4706329
<b>Speciated Metals</b>							
Chromium, Hexavalent	<0.50		0.50	ug/L		09-JUL-19	R4702350
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		15-JUL-19	R4710256
Benzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Bromodichloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Bromoform	<5.0		5.0	ug/L		15-JUL-19	R4710256
Bromomethane	<0.50		0.50	ug/L		15-JUL-19	R4710256

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-3 GW-11196246-070819-SO-MW1-19							
Sampled By: CLIENT on 08-JUL-19 @ 15:45							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Carbon tetrachloride	<0.20		0.20	ug/L		15-JUL-19	R4710256
Chlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dibromochloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Chloroform	<1.0		1.0	ug/L		15-JUL-19	R4710256
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JUL-19	R4710256
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dichlorodifluoromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methylene Chloride	<5.0		5.0	ug/L		15-JUL-19	R4710256
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		15-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
n-Hexane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methyl Ethyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
Methyl Isobutyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
MTBE	<2.0		2.0	ug/L		15-JUL-19	R4710256
Styrene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Tetrachloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Toluene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichlorofluoromethane	<5.0		5.0	ug/L		15-JUL-19	R4710256
Vinyl chloride	<0.50		0.50	ug/L		15-JUL-19	R4710256
o-Xylene	<0.30		0.30	ug/L		15-JUL-19	R4710256
m+p-Xylenes	<0.40		0.40	ug/L		15-JUL-19	R4710256
Xylenes (Total)	<0.50		0.50	ug/L		15-JUL-19	
Surrogate: 4-Bromofluorobenzene	97.9		70-130	%		15-JUL-19	R4710256
Surrogate: 1,4-Difluorobenzene	101.5		70-130	%		15-JUL-19	R4710256
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25	VOCHS	25	ug/L		16-JUL-19	R4712341

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-3 GW-11196246-070819-SO-MW1-19 Sampled By: CLIENT on 08-JUL-19 @ 15:45 Matrix: WATER							
<b>Hydrocarbons</b>							
F1-BTEX	<25		25	ug/L		16-JUL-19	
F2 (C10-C16)	<100		100	ug/L	08-JUL-19	09-JUL-19	R4701010
F2-Naphth	<100		100	ug/L		16-JUL-19	
F3 (C16-C34)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
F3-PAH	<250		250	ug/L		16-JUL-19	
F4 (C34-C50)	<250		250	ug/L	08-JUL-19	09-JUL-19	R4701010
Total Hydrocarbons (C6-C50)	<370		370	ug/L		16-JUL-19	
Chrom. to baseline at nC50	YES				08-JUL-19	09-JUL-19	R4701010
Surrogate: 2-Bromobenzotrifluoride	76.3		60-140	%	08-JUL-19	09-JUL-19	R4701010
Surrogate: 3,4-Dichlorotoluene	78.1		60-140	%		16-JUL-19	R4712341
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Acenaphthylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(a)pyrene	<0.010		0.010	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(b)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Benzo(k)fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Chrysene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluoranthene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Fluorene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		12-JUL-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
2-Methylnaphthalene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Naphthalene	<0.050		0.050	ug/L	08-JUL-19	12-JUL-19	R4708722
Phenanthrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Pyrene	<0.020		0.020	ug/L	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Acenaphthene	93.0		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d12-Chrysene	87.4		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d8-Naphthalene	96.6		60-140	%	08-JUL-19	12-JUL-19	R4708722
Surrogate: d10-Phenanthrene	94.6		60-140	%	08-JUL-19	12-JUL-19	R4708722
L2305757-4 TRIP BLANK Sampled By: CLIENT on 08-JUL-19 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		15-JUL-19	R4710256
Benzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Bromodichloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Bromoform	<5.0		5.0	ug/L		15-JUL-19	R4710256

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-4 TRIP BLANK							
Sampled By: CLIENT on 08-JUL-19							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Bromomethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Carbon tetrachloride	<0.20		0.20	ug/L		15-JUL-19	R4710256
Chlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dibromochloromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
Chloroform	<1.0		1.0	ug/L		15-JUL-19	R4710256
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JUL-19	R4710256
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Dichlorodifluoromethane	<2.0		2.0	ug/L		15-JUL-19	R4710256
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methylene Chloride	<5.0		5.0	ug/L		15-JUL-19	R4710256
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JUL-19	R4710256
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUL-19	R4710256
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		15-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		15-JUL-19	R4710256
n-Hexane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Methyl Ethyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
Methyl Isobutyl Ketone	<20		20	ug/L		15-JUL-19	R4710256
MTBE	<2.0		2.0	ug/L		15-JUL-19	R4710256
Styrene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Tetrachloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Toluene	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichloroethylene	<0.50		0.50	ug/L		15-JUL-19	R4710256
Trichlorofluoromethane	<5.0		5.0	ug/L		15-JUL-19	R4710256
Vinyl chloride	<0.50		0.50	ug/L		15-JUL-19	R4710256
o-Xylene	<0.30		0.30	ug/L		15-JUL-19	R4710256
m+p-Xylenes	<0.40		0.40	ug/L		15-JUL-19	R4710256
Xylenes (Total)	<0.50		0.50	ug/L		15-JUL-19	
Surrogate: 4-Bromofluorobenzene	98.4		70-130	%		15-JUL-19	R4710256
Surrogate: 1,4-Difluorobenzene	101.1		70-130	%		15-JUL-19	R4710256
<b>Hydrocarbons</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2305757-4 TRIP BLANK Sampled By: CLIENT on 08-JUL-19 Matrix: WATER							
<b>Hydrocarbons</b> F1 (C6-C10) F1-BTEX Surrogate: 3,4-Dichlorotoluene	<25 <25 88.3	VOCHS	25 25 60-140	ug/L ug/L %		16-JUL-19 16-JUL-19 16-JUL-19	R4712341 R4712341
(Empty table area for additional parameters and results)							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2305757-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2305757-1, -2, -3
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2305757-1, -2, -3

### Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
VOCHS	VOC analysis was conducted for a water sample that contained > 5% headspace. Results may be biased low.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
<p>This analysis is carried out using procedure adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p>			

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

ALS Test Code	Matrix	Test Description	Method Reference**
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

ALS Test Code	Matrix	Test Description	Method Reference**
F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

ALS Test Code	Matrix	Test Description	Method Reference**
F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

ALS Test Code	Matrix	Test Description	Method Reference**
HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

ALS Test Code	Matrix	Test Description	Method Reference**
MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8

The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental

## Reference Information

Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT Water PAH-Calculated Parameters SW846 8270

PAH-511-WT Water PAH-O. Reg 153/04 (July 2011) SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT Water Regulation 153 VOCs SW8260B/SW8270C

VOC-511-HS-WT Water VOC by GCMS HS O.Reg 153/04 (July 2011) SW846 8260

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT Water Sum of Xylene Isomer Concentrations CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
----------------------------	---------------------

WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
----	-----------------------------------------------

### Chain of Custody Numbers:

17-822905

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid weight of sample*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



### Quality Control Report

Workorder: L2305757

Report Date: 16-JUL-19

Page 1 of 11

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CR-CR6-IC-R511-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R4702350</b>							
<b>WG3099724-4</b>	<b>DUP</b>	<b>WG3099724-3</b>						
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	09-JUL-19
<b>WG3099724-2</b>	<b>LCS</b>		98.1		%		80-120	09-JUL-19
Chromium, Hexavalent								
<b>WG3099724-1</b>	<b>MB</b>		<0.50		ug/L		0.5	09-JUL-19
Chromium, Hexavalent								
<b>WG3099724-5</b>	<b>MS</b>	<b>WG3099724-3</b>	100.6		%		70-130	09-JUL-19
Chromium, Hexavalent								
<b>F1-HS-511-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R4712341</b>							
<b>WG3105809-4</b>	<b>DUP</b>	<b>WG3105809-3</b>						
F1 (C6-C10)		130	120		ug/L	8.2	30	16-JUL-19
<b>WG3105809-1</b>	<b>LCS</b>		107.3		%		80-120	16-JUL-19
F1 (C6-C10)								
<b>WG3105809-2</b>	<b>MB</b>		<25		ug/L		25	16-JUL-19
F1 (C6-C10)								
Surrogate: 3,4-Dichlorotoluene			105.8		%		60-140	16-JUL-19
<b>WG3105809-5</b>	<b>MS</b>	<b>L2306513-9</b>	95.1		%		60-140	16-JUL-19
F1 (C6-C10)								
<b>F2-F4-511-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R4701010</b>							
<b>WG3099275-2</b>	<b>LCS</b>		85.0		%		70-130	09-JUL-19
F2 (C10-C16)								
F3 (C16-C34)			89.8		%		70-130	09-JUL-19
F4 (C34-C50)			85.6		%		70-130	09-JUL-19
<b>WG3099275-1</b>	<b>MB</b>		<100		ug/L		100	09-JUL-19
F2 (C10-C16)								
F3 (C16-C34)			<250		ug/L		250	09-JUL-19
F4 (C34-C50)			<250		ug/L		250	09-JUL-19
Surrogate: 2-Bromobenzotrifluoride			83.9		%		60-140	09-JUL-19
<b>HG-D-UG/L-CVAA-WT</b>								
<b>Water</b>								
<b>Batch</b>	<b>R4699188</b>							
<b>WG3099498-4</b>	<b>DUP</b>	<b>WG3099498-3</b>						
Mercury (Hg)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	09-JUL-19
<b>WG3099498-2</b>	<b>LCS</b>		111.0		%		80-120	09-JUL-19
Mercury (Hg)-Dissolved								
<b>WG3099498-1</b>	<b>MB</b>							



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-D-UG/L-CVAA-WT Water</b>								
<b>Batch R4699188</b>								
<b>WG3099498-1 MB</b>								
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	09-JUL-19
<b>WG3099498-6 MS</b>								
Mercury (Hg)-Dissolved		<b>WG3099498-5</b>	112.6		%		70-130	09-JUL-19
<b>MET-D-UG/L-MS-WT Water</b>								
<b>Batch R4706329</b>								
<b>WG3099339-4 DUP</b>								
<b>WG3099339-3</b>								
Antimony (Sb)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Arsenic (As)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Barium (Ba)-Dissolved		129	129		ug/L	0.7	20	10-JUL-19
Beryllium (Be)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Boron (B)-Dissolved		<100	<100	RPD-NA	ug/L	N/A	20	10-JUL-19
Cadmium (Cd)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	10-JUL-19
Chromium (Cr)-Dissolved		<5.0	<5.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Cobalt (Co)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Copper (Cu)-Dissolved		<2.0	<2.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Lead (Pb)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	10-JUL-19
Molybdenum (Mo)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	10-JUL-19
Nickel (Ni)-Dissolved		<5.0	<5.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Selenium (Se)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	10-JUL-19
Silver (Ag)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	10-JUL-19
Sodium (Na)-Dissolved		787000	777000		ug/L	1.3	20	10-JUL-19
Thallium (Tl)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	10-JUL-19
Uranium (U)-Dissolved		0.59	0.58		ug/L	2.2	20	10-JUL-19
Vanadium (V)-Dissolved		<5.0	<5.0	RPD-NA	ug/L	N/A	20	10-JUL-19
Zinc (Zn)-Dissolved		<10	<10	RPD-NA	ug/L	N/A	20	10-JUL-19
<b>WG3099339-2 LCS</b>								
Antimony (Sb)-Dissolved			99.2		%		80-120	10-JUL-19
Arsenic (As)-Dissolved			99.1		%		80-120	10-JUL-19
Barium (Ba)-Dissolved			98.3		%		80-120	10-JUL-19
Beryllium (Be)-Dissolved			99.4		%		80-120	10-JUL-19
Boron (B)-Dissolved			98.2		%		80-120	10-JUL-19
Cadmium (Cd)-Dissolved			97.0		%		80-120	10-JUL-19
Chromium (Cr)-Dissolved			100.6		%		80-120	10-JUL-19



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Client: GHD Limited (Waterloo)  
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Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4706329</b>							
<b>WG3099339-2</b>	<b>LCS</b>							
Cobalt (Co)-Dissolved			100.3		%		80-120	10-JUL-19
Copper (Cu)-Dissolved			100.4		%		80-120	10-JUL-19
Lead (Pb)-Dissolved			101.3		%		80-120	10-JUL-19
Molybdenum (Mo)-Dissolved			97.2		%		80-120	10-JUL-19
Nickel (Ni)-Dissolved			99.8		%		80-120	10-JUL-19
Selenium (Se)-Dissolved			100.7		%		80-120	10-JUL-19
Silver (Ag)-Dissolved			99.1		%		80-120	10-JUL-19
Sodium (Na)-Dissolved			107.0		%		80-120	10-JUL-19
Thallium (Tl)-Dissolved			101.6		%		80-120	10-JUL-19
Uranium (U)-Dissolved			99.7		%		80-120	10-JUL-19
Vanadium (V)-Dissolved			101.6		%		80-120	10-JUL-19
Zinc (Zn)-Dissolved			101.1		%		80-120	10-JUL-19
<b>WG3099339-1</b>	<b>MB</b>							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	10-JUL-19
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	10-JUL-19
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	10-JUL-19
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	10-JUL-19
Boron (B)-Dissolved			<10		ug/L		10	10-JUL-19
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	10-JUL-19
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	10-JUL-19
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	10-JUL-19
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	10-JUL-19
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	10-JUL-19
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	10-JUL-19
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	10-JUL-19
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	10-JUL-19
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	10-JUL-19
Sodium (Na)-Dissolved			<50		ug/L		50	10-JUL-19
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	10-JUL-19
Uranium (U)-Dissolved			<0.010		ug/L		0.01	10-JUL-19
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	10-JUL-19
Zinc (Zn)-Dissolved			<1.0		ug/L		1	10-JUL-19
<b>WG3099339-5</b>	<b>MS</b>	<b>WG3099339-6</b>						
Antimony (Sb)-Dissolved			96.0		%		70-130	10-JUL-19





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Client: GHD Limited (Waterloo)  
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Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4706329</b>							
<b>WG3099339-5</b>	<b>MS</b>	<b>WG3099339-6</b>						
Arsenic (As)-Dissolved			99.3		%		70-130	10-JUL-19
Barium (Ba)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Beryllium (Be)-Dissolved			100.7		%		70-130	10-JUL-19
Boron (B)-Dissolved			81.9		%		70-130	10-JUL-19
Cadmium (Cd)-Dissolved			82.4		%		70-130	10-JUL-19
Chromium (Cr)-Dissolved			104.3		%		70-130	10-JUL-19
Cobalt (Co)-Dissolved			96.6		%		70-130	10-JUL-19
Copper (Cu)-Dissolved			84.4		%		70-130	10-JUL-19
Lead (Pb)-Dissolved			85.8		%		70-130	10-JUL-19
Molybdenum (Mo)-Dissolved			104.6		%		70-130	10-JUL-19
Nickel (Ni)-Dissolved			89.5		%		70-130	10-JUL-19
Selenium (Se)-Dissolved			98.1		%		70-130	10-JUL-19
Silver (Ag)-Dissolved			82.8		%		70-130	10-JUL-19
Sodium (Na)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Thallium (Tl)-Dissolved			87.5		%		70-130	10-JUL-19
Uranium (U)-Dissolved			N/A	MS-B	%		-	10-JUL-19
Vanadium (V)-Dissolved			111.0		%		70-130	10-JUL-19
Zinc (Zn)-Dissolved			82.3		%		70-130	10-JUL-19
<b>PAH-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4708722</b>							
<b>WG3099275-2</b>	<b>LCS</b>							
1-Methylnaphthalene			108.2		%		50-140	12-JUL-19
2-Methylnaphthalene			103.7		%		50-140	12-JUL-19
Acenaphthene			117.0		%		50-140	12-JUL-19
Acenaphthylene			109.0		%		50-140	12-JUL-19
Anthracene			115.7		%		50-140	12-JUL-19
Benzo(a)anthracene			117.4		%		50-140	12-JUL-19
Benzo(a)pyrene			111.6		%		50-140	12-JUL-19
Benzo(b)fluoranthene			112.5		%		50-140	12-JUL-19
Benzo(g,h,i)perylene			117.0		%		50-140	12-JUL-19
Benzo(k)fluoranthene			111.7		%		50-140	12-JUL-19
Chrysene			118.6		%		50-140	12-JUL-19
Dibenzo(ah)anthracene			109.8		%		50-140	12-JUL-19
Fluoranthene			117.9		%		50-140	12-JUL-19



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Client: GHD Limited (Waterloo)  
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Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PAH-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4708722</b>							
<b>WG3099275-2</b>	<b>LCS</b>							
Fluoranthene			117.9		%		50-140	12-JUL-19
Fluorene			114.8		%		50-140	12-JUL-19
Indeno(1,2,3-cd)pyrene			116.3		%		50-140	12-JUL-19
Naphthalene			112.7		%		50-140	12-JUL-19
Phenanthrene			120.2		%		50-140	12-JUL-19
Pyrene			121.4		%		50-140	12-JUL-19
<b>WG3099275-1</b>	<b>MB</b>							
1-Methylnaphthalene			<0.020		ug/L		0.02	12-JUL-19
2-Methylnaphthalene			<0.020		ug/L		0.02	12-JUL-19
Acenaphthene			<0.020		ug/L		0.02	12-JUL-19
Acenaphthylene			<0.020		ug/L		0.02	12-JUL-19
Anthracene			<0.020		ug/L		0.02	12-JUL-19
Benzo(a)anthracene			<0.020		ug/L		0.02	12-JUL-19
Benzo(a)pyrene			<0.010		ug/L		0.01	12-JUL-19
Benzo(b)fluoranthene			<0.020		ug/L		0.02	12-JUL-19
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	12-JUL-19
Benzo(k)fluoranthene			<0.020		ug/L		0.02	12-JUL-19
Chrysene			<0.020		ug/L		0.02	12-JUL-19
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	12-JUL-19
Fluoranthene			<0.020		ug/L		0.02	12-JUL-19
Fluorene			<0.020		ug/L		0.02	12-JUL-19
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	12-JUL-19
Naphthalene			<0.050		ug/L		0.05	12-JUL-19
Phenanthrene			<0.020		ug/L		0.02	12-JUL-19
Pyrene			<0.020		ug/L		0.02	12-JUL-19
Surrogate: d8-Naphthalene			112.8		%		60-140	12-JUL-19
Surrogate: d10-Phenanthrene			106.4		%		60-140	12-JUL-19
Surrogate: d12-Chrysene			101.9		%		60-140	12-JUL-19
Surrogate: d10-Acenaphthene			107.8		%		60-140	12-JUL-19
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-4</b>	<b>DUP</b>	<b>WG3103236-3</b>						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19



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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-4</b>	<b>DUP</b>	<b>WG3103236-3</b>						
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-JUL-19
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	15-JUL-19
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JUL-19
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	15-JUL-19
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-JUL-19
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUL-19
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUL-19
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JUL-19
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JUL-19
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-JUL-19
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUL-19
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUL-19
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	15-JUL-19
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JUL-19
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUL-19
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Toluene		<0.50	<0.50		ug/L			15-JUL-19



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Client: GHD Limited (Waterloo)  
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Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-4</b>	<b>DUP</b>	<b>WG3103236-3</b>						
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUL-19
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	15-JUL-19
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUL-19
<b>WG3103236-1</b>	<b>LCS</b>							
1,1,1,2-Tetrachloroethane			108.3		%		70-130	15-JUL-19
1,1,2,2-Tetrachloroethane			110.9		%		70-130	15-JUL-19
1,1,1-Trichloroethane			112.4		%		70-130	15-JUL-19
1,1,2-Trichloroethane			107.4		%		70-130	15-JUL-19
1,1-Dichloroethane			115.6		%		70-130	15-JUL-19
1,1-Dichloroethylene			110.7		%		70-130	15-JUL-19
1,2-Dibromoethane			106.8		%		70-130	15-JUL-19
1,2-Dichlorobenzene			113.0		%		70-130	15-JUL-19
1,2-Dichloroethane			105.6		%		70-130	15-JUL-19
1,2-Dichloropropane			108.1		%		70-130	15-JUL-19
1,3-Dichlorobenzene			110.2		%		70-130	15-JUL-19
1,4-Dichlorobenzene			110.4		%		70-130	15-JUL-19
Acetone			111.5		%		60-140	15-JUL-19
Benzene			115.2		%		70-130	15-JUL-19
Bromodichloromethane			106.4		%		70-130	15-JUL-19
Bromoform			103.9		%		70-130	15-JUL-19
Bromomethane			122.6		%		60-140	15-JUL-19
Carbon tetrachloride			109.3		%		70-130	15-JUL-19
Chlorobenzene			114.1		%		70-130	15-JUL-19
Chloroform			112.8		%		70-130	15-JUL-19
cis-1,2-Dichloroethylene			105.5		%		70-130	15-JUL-19
cis-1,3-Dichloropropene			103.1		%		70-130	15-JUL-19
Dibromochloromethane			107.2		%		70-130	15-JUL-19
Dichlorodifluoromethane			114.1		%		50-140	15-JUL-19
Ethylbenzene			110.4		%		70-130	15-JUL-19
n-Hexane			109.8		%		70-130	15-JUL-19



### Quality Control Report

Workorder: L2305757

Report Date: 16-JUL-19

Page 8 of 11

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-1</b>	<b>LCS</b>							
m+p-Xylenes			110.2		%		70-130	15-JUL-19
Methyl Ethyl Ketone			100.7		%		60-140	15-JUL-19
Methyl Isobutyl Ketone			101.0		%		60-140	15-JUL-19
Methylene Chloride			107.0		%		70-130	15-JUL-19
MTBE			111.8		%		70-130	15-JUL-19
o-Xylene			110.9		%		70-130	15-JUL-19
Styrene			116.1		%		70-130	15-JUL-19
Tetrachloroethylene			112.3		%		70-130	15-JUL-19
Toluene			112.3		%		70-130	15-JUL-19
trans-1,2-Dichloroethylene			111.6		%		70-130	15-JUL-19
trans-1,3-Dichloropropene			104.5		%		70-130	15-JUL-19
Trichloroethylene			110.9		%		70-130	15-JUL-19
Trichlorofluoromethane			118.3		%		60-140	15-JUL-19
Vinyl chloride			103.1		%		60-140	15-JUL-19
<b>WG3103236-2</b>	<b>MB</b>							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JUL-19
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JUL-19
1,1,1-Trichloroethane			<0.50		ug/L		0.5	15-JUL-19
1,1,2-Trichloroethane			<0.50		ug/L		0.5	15-JUL-19
1,1-Dichloroethane			<0.50		ug/L		0.5	15-JUL-19
1,1-Dichloroethylene			<0.50		ug/L		0.5	15-JUL-19
1,2-Dibromoethane			<0.20		ug/L		0.2	15-JUL-19
1,2-Dichlorobenzene			<0.50		ug/L		0.5	15-JUL-19
1,2-Dichloroethane			<0.50		ug/L		0.5	15-JUL-19
1,2-Dichloropropane			<0.50		ug/L		0.5	15-JUL-19
1,3-Dichlorobenzene			<0.50		ug/L		0.5	15-JUL-19
1,4-Dichlorobenzene			<0.50		ug/L		0.5	15-JUL-19
Acetone			<30		ug/L		30	15-JUL-19
Benzene			<0.50		ug/L		0.5	15-JUL-19
Bromodichloromethane			<2.0		ug/L		2	15-JUL-19
Bromoform			<5.0		ug/L		5	15-JUL-19
Bromomethane			<0.50		ug/L		0.5	15-JUL-19
Carbon tetrachloride			<0.20		ug/L		0.2	15-JUL-19
Chlorobenzene			<0.50		ug/L		0.5	15-JUL-19



## Quality Control Report

Workorder: L2305757

Report Date: 16-JUL-19

Page 9 of 11

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-2 MB</b>								
Chloroform			<1.0		ug/L		1	15-JUL-19
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JUL-19
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JUL-19
Dibromochloromethane			<2.0		ug/L		2	15-JUL-19
Dichlorodifluoromethane			<2.0		ug/L		2	15-JUL-19
Ethylbenzene			<0.50		ug/L		0.5	15-JUL-19
n-Hexane			<0.50		ug/L		0.5	15-JUL-19
m+p-Xylenes			<0.40		ug/L		0.4	15-JUL-19
Methyl Ethyl Ketone			<20		ug/L		20	15-JUL-19
Methyl Isobutyl Ketone			<20		ug/L		20	15-JUL-19
Methylene Chloride			<5.0		ug/L		5	15-JUL-19
MTBE			<2.0		ug/L		2	15-JUL-19
o-Xylene			<0.30		ug/L		0.3	15-JUL-19
Styrene			<0.50		ug/L		0.5	15-JUL-19
Tetrachloroethylene			<0.50		ug/L		0.5	15-JUL-19
Toluene			<0.50		ug/L		0.5	15-JUL-19
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JUL-19
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JUL-19
Trichloroethylene			<0.50		ug/L		0.5	15-JUL-19
Trichlorofluoromethane			<5.0		ug/L		5	15-JUL-19
Vinyl chloride			<0.50		ug/L		0.5	15-JUL-19
Surrogate: 1,4-Difluorobenzene			100.9		%		70-130	15-JUL-19
Surrogate: 4-Bromofluorobenzene			98.9		%		70-130	15-JUL-19
<b>WG3103236-5 MS</b>		<b>WG3103236-3</b>						
1,1,1,2-Tetrachloroethane			106.9		%		50-140	15-JUL-19
1,1,1,2-Tetrachloroethane			105.2		%		50-140	15-JUL-19
1,1,1-Trichloroethane			115.6		%		50-140	15-JUL-19
1,1,2-Trichloroethane			100.7		%		50-140	15-JUL-19
1,1-Dichloroethane			116.5		%		50-140	15-JUL-19
1,1-Dichloroethylene			111.8		%		50-140	15-JUL-19
1,2-Dibromoethane			98.3		%		50-140	15-JUL-19
1,2-Dichlorobenzene			113.1		%		50-140	15-JUL-19
1,2-Dichloroethane			99.9		%		50-140	15-JUL-19
1,2-Dichloropropane			106.0		%		50-140	15-JUL-19

## Quality Control Report

Workorder: L2305757

Report Date: 16-JUL-19

Page 10 of 11

Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4710256</b>							
<b>WG3103236-5 MS</b>		<b>WG3103236-3</b>						
1,3-Dichlorobenzene			113.2		%		50-140	15-JUL-19
1,4-Dichlorobenzene			112.8		%		50-140	15-JUL-19
Acetone			98.3		%		50-140	15-JUL-19
Benzene			114.0		%		50-140	15-JUL-19
Bromodichloromethane			104.1		%		50-140	15-JUL-19
Bromoform			96.6		%		50-140	15-JUL-19
Bromomethane			115.4		%		50-140	15-JUL-19
Carbon tetrachloride			112.7		%		50-140	15-JUL-19
Chlorobenzene			114.2		%		50-140	15-JUL-19
Chloroform			112.5		%		50-140	15-JUL-19
cis-1,2-Dichloroethylene			104.1		%		50-140	15-JUL-19
cis-1,3-Dichloropropene			100.6		%		50-140	15-JUL-19
Dibromochloromethane			102.8		%		50-140	15-JUL-19
Dichlorodifluoromethane			103.3		%		50-140	15-JUL-19
Ethylbenzene			112.4		%		50-140	15-JUL-19
n-Hexane			108.8		%		50-140	15-JUL-19
m+p-Xylenes			112.6		%		50-140	15-JUL-19
Methyl Ethyl Ketone			84.9		%		50-140	15-JUL-19
Methyl Isobutyl Ketone			89.5		%		50-140	15-JUL-19
Methylene Chloride			102.7		%		50-140	15-JUL-19
MTBE			111.7		%		50-140	15-JUL-19
o-Xylene			111.9		%		50-140	15-JUL-19
Styrene			112.2		%		50-140	15-JUL-19
Tetrachloroethylene			116.1		%		50-140	15-JUL-19
Toluene			113.5		%		50-140	15-JUL-19
trans-1,2-Dichloroethylene			113.8		%		50-140	15-JUL-19
trans-1,3-Dichloropropene			100.8		%		50-140	15-JUL-19
Trichloroethylene			112.0		%		50-140	15-JUL-19
Trichlorofluoromethane			118.5		%		50-140	15-JUL-19
Vinyl chloride			99.3		%		50-140	15-JUL-19

# Quality Control Report

Workorder: L2305757

Report Date: 16-JUL-19

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Page 11 of 11

Contact: Pascal Renella

## Legend:

---

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

---

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

---

## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

---

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

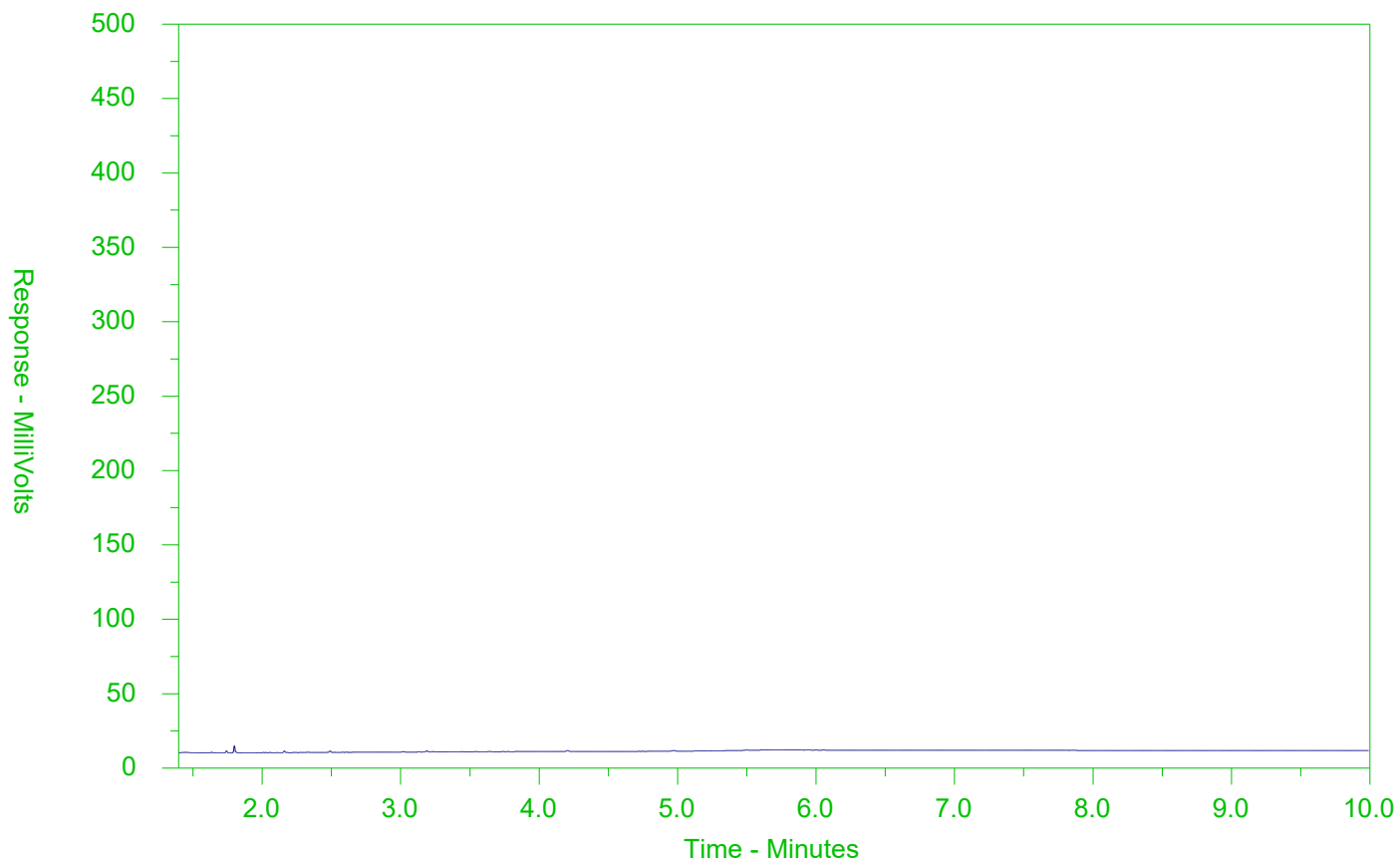
Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2305757-1  
 Client Sample ID: GW-11196246-070819-SO-MW3-19



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

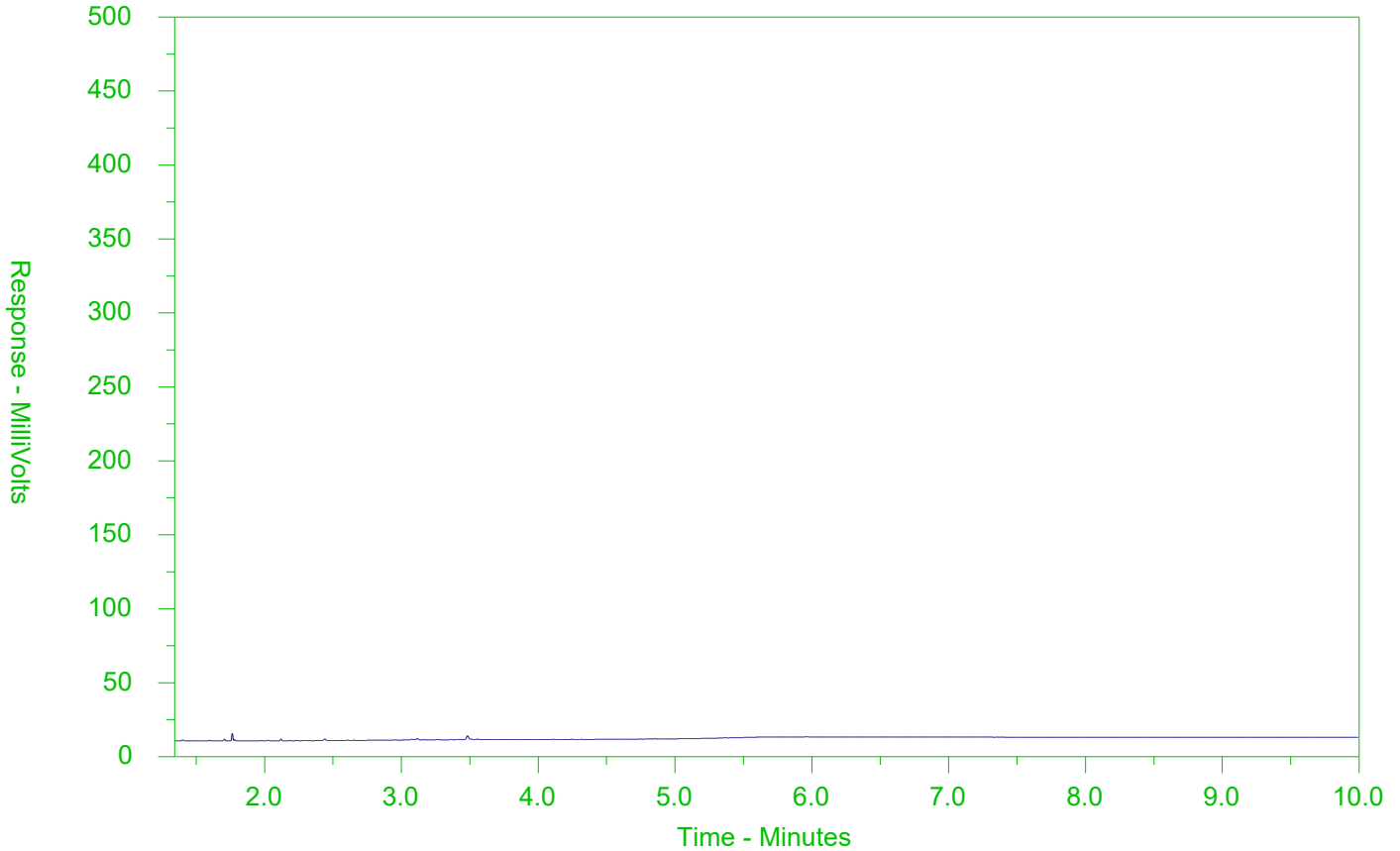
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2305757-2  
 Client Sample ID: GW-11196246-070819-SO-MW100



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

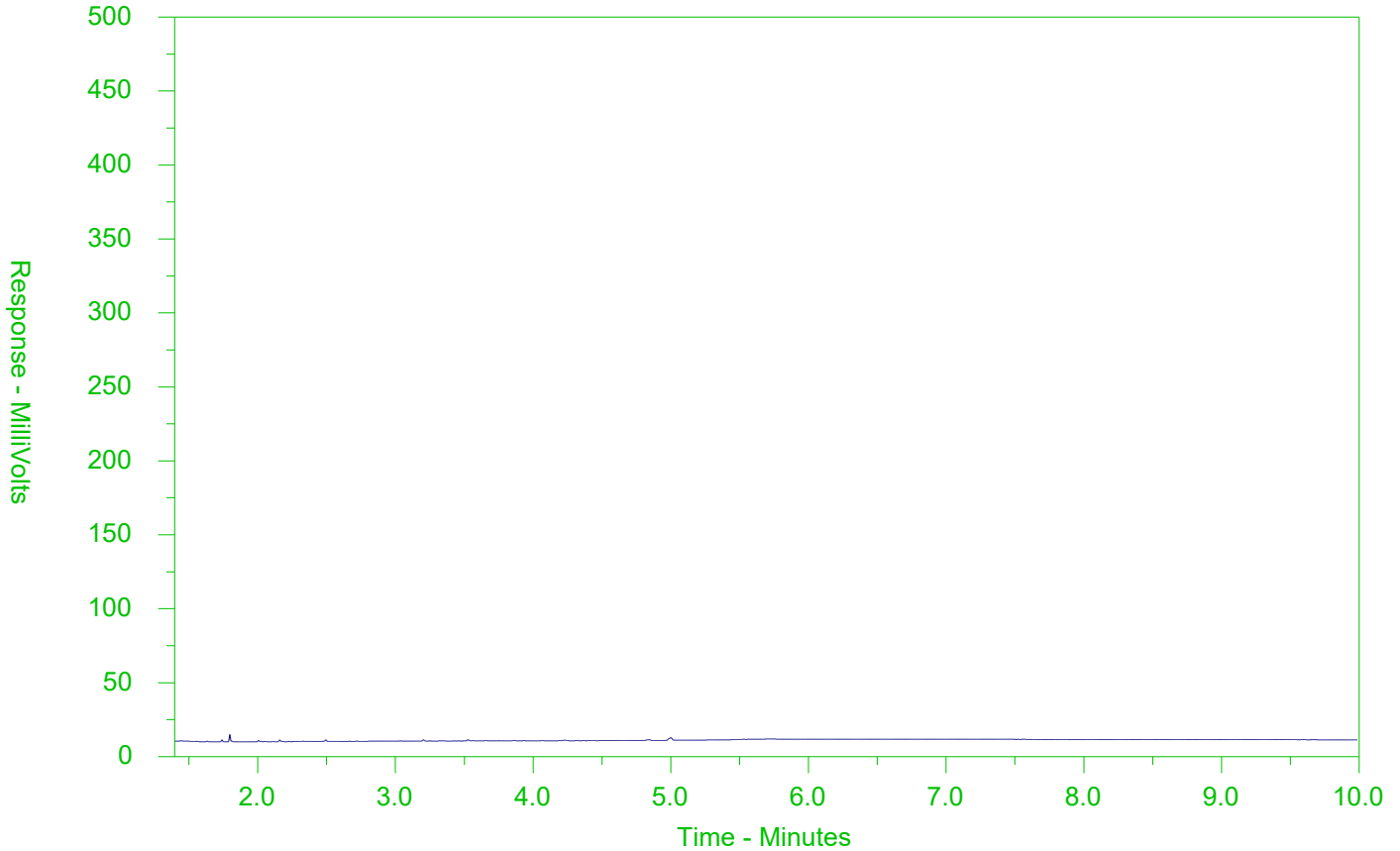
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2305757-3  
 Client Sample ID: GW-11196246-070819-SO-MW1-19



← F2 →		← F3 →		← F4 →	
nC10	nC16	nC34	nC50		
174°C	287°C	481°C	575°C		
346°F	549°F	898°F	1067°F		
Gasoline →			← Motor Oils/Lube Oils/Grease		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



Chain of Custody (COC) / Analytical Request Form



L2305757-COFC

COC Number: 17 - 822905

Page 1 of 1

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>		<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>			
<b>Company:</b> GHD Limited		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply			
<b>Contact:</b> PASCAL RENELLA		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<b>PRIORITY (Business Days)</b>	4 day [P4-20%] <input type="checkbox"/>	<b>EMERGENCY</b>	1 Business day [E - 100%] <input type="checkbox"/>
<b>Phone:</b> 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] <input type="checkbox"/>
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		<b>Date and Time Required for all E&amp;P TATs:</b>		dd-mmm-yy hh:mm	
<b>Street:</b> 455 PHILLIP STREET		Email 1 or Fax: SAME AS INVOICE		For tests that can not be performed according to the service level selected, you will be contacted.			
<b>City/Province:</b> WATERLOO, ON		Email 2: (SEE PO)		<b>Analysis Request</b> Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below			
<b>Postal Code:</b> N2L 2X2		Email 3:					

<b>Invoice To</b> Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		<b>Invoice Distribution</b>	
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	
<b>Company:</b> SEE PO.		Email 1 or Fax: SEE PO.	
<b>Contact:</b>		Email 2:	
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>	
<b>ALS Account # / Quote #:</b>		AFE/Cost Center: PO#	
<b>Job #:</b>		Major/Minor Code: Routing Code:	
<b>PO / AFE:</b>		Requisitioner:	
<b>LSD:</b>		Location:	

<b>ALS Lab Work Order # (lab use only):</b> L2305757			<b>ALS Contact:</b>		<b>Sampler:</b>	
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	ANALYSIS
	GW-11196246-070819-S0-MW3-R	08-JUL-19	13:40	GW	7	X X X X X X X X
	GW-11196246-070819-S0-MW100	↓	13:40	GW	7	X X X X X X X X
	GW-11196246-070819-S0-MW1-19	↓	15:45	GW	7	X X X X X X X X
	TRIP BLANK	↓	—	W	2	X

SAMPLES ON HOLD  
SUSPECTED HAZARD (see Special Instructions)

<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>				<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>			
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Frozen <input type="checkbox"/>		SIP Observations Yes <input type="checkbox"/> No <input type="checkbox"/>	
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO						Ice Packs <input type="checkbox"/>		Ice Cubes <input type="checkbox"/>	
						Cooling Initiated <input type="checkbox"/>			
						INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C	

<b>SHIPMENT RELEASE (client use)</b>			<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>			<b>FINAL SHIPMENT RECEPTION (lab use only)</b>		
Released by: S. ORMEL	Date: 08-JUL-19	Time: 18:00	Received by:	Date:	Time:	Received by: [Signature]	Date: JULY 8/19/18	Time: 8:00



GHD Limited (Waterloo)  
ATTN: Pascal Renella  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Date Received: 11-JUL-19  
Report Date: 16-OCT-19 09:14 (MT)  
Version: FINAL REV. 2

Client Phone: 450-973-4165

## Certificate of Analysis

Lab Work Order #: L2308539  
Project P.O. #: 73516171  
Job Reference: 11196246  
C of C Numbers: 17-822975  
Legal Site Desc:

Comments:

16-OCT-2019 Sample Date amended as per COFC.

Rick Hawthorne  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2308539-1 GW-11196246-071119-SO-MW4-19							
Sampled By: SO on 11-JUL-19 @ 16:00							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		16-JUL-19	R4712563
Benzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Bromodichloromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
Bromoform	<5.0		5.0	ug/L		16-JUL-19	R4712563
Bromomethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Carbon tetrachloride	<0.20		0.20	ug/L		16-JUL-19	R4712563
Chlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Dibromochloromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
Chloroform	<1.0		1.0	ug/L		16-JUL-19	R4712563
1,2-Dibromoethane	<0.20		0.20	ug/L		16-JUL-19	R4712563
1,2-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,3-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,4-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Dichlorodifluoromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
1,1-Dichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,2-Dichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Methylene Chloride	<5.0		5.0	ug/L		16-JUL-19	R4712563
1,2-Dichloropropane	<0.50		0.50	ug/L		16-JUL-19	R4712563
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		16-JUL-19	R4712563
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		16-JUL-19	R4712563
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		16-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
n-Hexane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Methyl Ethyl Ketone	<20		20	ug/L		16-JUL-19	R4712563
Methyl Isobutyl Ketone	<20		20	ug/L		16-JUL-19	R4712563
MTBE	<2.0		2.0	ug/L		16-JUL-19	R4712563
Styrene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Tetrachloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Toluene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,1-Trichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,2-Trichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Trichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Trichlorofluoromethane	<5.0		5.0	ug/L		16-JUL-19	R4712563
Vinyl chloride	<0.50		0.50	ug/L		16-JUL-19	R4712563
o-Xylene	<0.30		0.30	ug/L		16-JUL-19	R4712563
m+p-Xylenes	<0.40		0.40	ug/L		16-JUL-19	R4712563

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2308539-1 GW-11196246-071119-SO-MW4-19 Sampled By: SO on 11-JUL-19 @ 16:00 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Xylenes (Total)	<0.50		0.50	ug/L		16-JUL-19	
Surrogate: 4-Bromofluorobenzene	92.1		70-130	%		16-JUL-19	R4712563
Surrogate: 1,4-Difluorobenzene	97.6		70-130	%		16-JUL-19	R4712563
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25		25	ug/L		16-JUL-19	R4712563
F1-BTEX	<25		25	ug/L		16-JUL-19	
F2 (C10-C16)	<100		100	ug/L	11-JUL-19	12-JUL-19	R4709012
F2-Naphth	<100		100	ug/L		16-JUL-19	
F3 (C16-C34)	<250		250	ug/L	11-JUL-19	12-JUL-19	R4709012
F3-PAH	<250		250	ug/L		16-JUL-19	
F4 (C34-C50)	<250		250	ug/L	11-JUL-19	12-JUL-19	R4709012
Total Hydrocarbons (C6-C50)	<370		370	ug/L		16-JUL-19	
Chrom. to baseline at nC50	YES				11-JUL-19	12-JUL-19	R4709012
Surrogate: 2-Bromobenzotrifluoride	80.4		60-140	%	11-JUL-19	12-JUL-19	R4709012
Surrogate: 3,4-Dichlorotoluene	74.8		60-140	%		16-JUL-19	R4712563
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Acenaphthylene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Anthracene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Benzo(a)anthracene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Benzo(a)pyrene	<0.010		0.010	ug/L	11-JUL-19	16-JUL-19	R4712426
Benzo(b)fluoranthene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Benzo(k)fluoranthene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Chrysene	0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Fluoranthene	0.038		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Fluorene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		16-JUL-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
2-Methylnaphthalene	<0.020		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Naphthalene	<0.050		0.050	ug/L	11-JUL-19	16-JUL-19	R4712426
Phenanthrene	0.059		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Pyrene	0.039		0.020	ug/L	11-JUL-19	16-JUL-19	R4712426
Surrogate: d10-Acenaphthene	113.5		60-140	%	11-JUL-19	16-JUL-19	R4712426
Surrogate: d12-Chrysene	109.3		60-140	%	11-JUL-19	16-JUL-19	R4712426
Surrogate: d8-Naphthalene	105.9		60-140	%	11-JUL-19	16-JUL-19	R4712426
Surrogate: d10-Phenanthrene	104.4		60-140	%	11-JUL-19	16-JUL-19	R4712426
L2308539-2 TRIP BLANK Sampled By: SO on 11-JUL-19 Matrix: WATER							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2308539-2 TRIP BLANK Sampled By: SO on 11-JUL-19 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		16-JUL-19	R4712563
Benzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Bromodichloromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
Bromoform	<5.0		5.0	ug/L		16-JUL-19	R4712563
Bromomethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Carbon tetrachloride	<0.20		0.20	ug/L		16-JUL-19	R4712563
Chlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Dibromochloromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
Chloroform	<1.0		1.0	ug/L		16-JUL-19	R4712563
1,2-Dibromoethane	<0.20		0.20	ug/L		16-JUL-19	R4712563
1,2-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,3-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,4-Dichlorobenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Dichlorodifluoromethane	<2.0		2.0	ug/L		16-JUL-19	R4712563
1,1-Dichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,2-Dichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Methylene Chloride	<5.0		5.0	ug/L		16-JUL-19	R4712563
1,2-Dichloropropane	<0.50		0.50	ug/L		16-JUL-19	R4712563
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		16-JUL-19	R4712563
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		16-JUL-19	R4712563
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		16-JUL-19	
Ethylbenzene	<0.50		0.50	ug/L		16-JUL-19	R4712563
n-Hexane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Methyl Ethyl Ketone	<20		20	ug/L		16-JUL-19	R4712563
Methyl Isobutyl Ketone	<20		20	ug/L		16-JUL-19	R4712563
MTBE	<2.0		2.0	ug/L		16-JUL-19	R4712563
Styrene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Tetrachloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Toluene	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,1-Trichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
1,1,2-Trichloroethane	<0.50		0.50	ug/L		16-JUL-19	R4712563
Trichloroethylene	<0.50		0.50	ug/L		16-JUL-19	R4712563
Trichlorofluoromethane	<5.0		5.0	ug/L		16-JUL-19	R4712563
Vinyl chloride	<0.50		0.50	ug/L		16-JUL-19	R4712563
o-Xylene	<0.30		0.30	ug/L		16-JUL-19	R4712563
m+p-Xylenes	<0.40		0.40	ug/L		16-JUL-19	R4712563

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2308539-2 TRIP BLANK Sampled By: SO on 11-JUL-19 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Xylenes (Total)	<0.50		0.50	ug/L		16-JUL-19	
Surrogate: 4-Bromofluorobenzene	96.1		70-130	%		16-JUL-19	R4712563
Surrogate: 1,4-Difluorobenzene	99.8		70-130	%		16-JUL-19	R4712563
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25		25	ug/L		16-JUL-19	R4712563
F1-BTEX	<25		25	ug/L		16-JUL-19	
Surrogate: 3,4-Dichlorotoluene	90.7		60-140	%		16-JUL-19	R4712563

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
F1-F4-511-CALC-WT	Water	F1-F4 Hydrocarbon Calculated Parameters	CCME CWS-PHC, Pub #1310, Dec 2001-L
<p>Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.</p> <p>In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.</p> <p>In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.</p> <p>In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.</p> <p>Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:</p> <ol style="list-style-type: none"> <li>1. All extraction and analysis holding times were met.</li> <li>2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.</li> <li>3. Linearity of gasoline response within 15% throughout the calibration range.</li> </ol> <p>Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:</p> <ol style="list-style-type: none"> <li>1. All extraction and analysis holding times were met.</li> <li>2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.</li> <li>3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.</li> <li>4. Linearity of diesel or motor oil response within 15% throughout the calibration range.</li> </ol>			
F1-HS-511-WT	Water	F1-O.Reg 153/04 (July 2011)	E3398/CCME TIER 1-HS
<p>Fraction F1 is determined by analyzing by headspace-GC/FID.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
F2-F4-511-WT	Water	F2-F4-O.Reg 153/04 (July 2011)	EPA 3511/CCME Tier 1
<p>Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
METHYLNAPS-CALC-WT	Water	PAH-Calculated Parameters	SW846 8270
PAH-511-WT	Water	PAH-O. Reg 153/04 (July 2011)	SW846 3510/8270
<p>Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
VOC-1,3-DCP-CALC-WT	Water	Regulation 153 VOCs	SW8260B/SW8270C
VOC-511-HS-WT	Water	VOC by GCMS HS O.Reg 153/04 (July 2011)	SW846 8260
<p>Liquid samples are analyzed by headspace GC/MSD.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			
XYLENES-SUM-CALC-WT	Water	Sum of Xylene Isomer Concentrations	CALCULATION
<p>Total xylenes represents the sum of o-xylene and m&amp;p-xylene.</p>			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

## Reference Information

### Chain of Custody Numbers:

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17-822975

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid weight of sample*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*



### Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

Page 1 of 8

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>F1-HS-511-WT</b>								
	Water							
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-4</b>	<b>DUP</b>	<b>WG3098658-3</b>						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	16-JUL-19
<b>WG3098658-1</b>	<b>LCS</b>							
F1 (C6-C10)			82.3		%		80-120	16-JUL-19
<b>WG3098658-2</b>	<b>MB</b>							
F1 (C6-C10)			<25		ug/L		25	16-JUL-19
Surrogate: 3,4-Dichlorotoluene			96.3		%		60-140	16-JUL-19
<b>WG3098658-5</b>	<b>MS</b>	<b>WG3098658-3</b>						
F1 (C6-C10)			88.5		%		60-140	16-JUL-19
<b>F2-F4-511-WT</b>								
	Water							
<b>Batch</b>	<b>R4709012</b>							
<b>WG3102906-2</b>	<b>LCS</b>							
F2 (C10-C16)			89.1		%		70-130	12-JUL-19
F3 (C16-C34)			93.7		%		70-130	12-JUL-19
F4 (C34-C50)			88.1		%		70-130	12-JUL-19
<b>WG3102906-1</b>	<b>MB</b>							
F2 (C10-C16)			<100		ug/L		100	12-JUL-19
F3 (C16-C34)			<250		ug/L		250	12-JUL-19
F4 (C34-C50)			<250		ug/L		250	12-JUL-19
Surrogate: 2-Bromobenzotrifluoride			84.4		%		60-140	12-JUL-19
<b>PAH-511-WT</b>								
	Water							
<b>Batch</b>	<b>R4712426</b>							
<b>WG3102906-2</b>	<b>LCS</b>							
1-Methylnaphthalene			105.0		%		50-140	16-JUL-19
2-Methylnaphthalene			99.4		%		50-140	16-JUL-19
Acenaphthene			113.7		%		50-140	16-JUL-19
Acenaphthylene			107.4		%		50-140	16-JUL-19
Anthracene			116.2		%		50-140	16-JUL-19
Benzo(a)anthracene			124.2		%		50-140	16-JUL-19
Benzo(a)pyrene			115.2		%		50-140	16-JUL-19
Benzo(b)fluoranthene			111.9		%		50-140	16-JUL-19
Benzo(g,h,i)perylene			110.9		%		50-140	16-JUL-19
Benzo(k)fluoranthene			117.8		%		50-140	16-JUL-19
Chrysene			125.7		%		50-140	16-JUL-19
Dibenzo(ah)anthracene			109.5		%		50-140	16-JUL-19
Fluoranthene			112.2		%		50-140	16-JUL-19



### Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

Page 2 of 8

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PAH-511-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4712426</b>							
<b>WG3102906-2</b>	<b>LCS</b>							
Fluorene			110.8		%		50-140	16-JUL-19
Indeno(1,2,3-cd)pyrene			114.3		%		50-140	16-JUL-19
Naphthalene			107.1		%		50-140	16-JUL-19
Phenanthrene			116.6		%		50-140	16-JUL-19
Pyrene			114.2		%		50-140	16-JUL-19
<b>WG3102906-1</b>	<b>MB</b>							
1-Methylnaphthalene			<0.020		ug/L		0.02	16-JUL-19
2-Methylnaphthalene			<0.020		ug/L		0.02	16-JUL-19
Acenaphthene			<0.020		ug/L		0.02	16-JUL-19
Acenaphthylene			<0.020		ug/L		0.02	16-JUL-19
Anthracene			<0.020		ug/L		0.02	16-JUL-19
Benzo(a)anthracene			<0.020		ug/L		0.02	16-JUL-19
Benzo(a)pyrene			<0.010		ug/L		0.01	16-JUL-19
Benzo(b)fluoranthene			<0.020		ug/L		0.02	16-JUL-19
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	16-JUL-19
Benzo(k)fluoranthene			<0.020		ug/L		0.02	16-JUL-19
Chrysene			<0.020		ug/L		0.02	16-JUL-19
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	16-JUL-19
Fluoranthene			<0.020		ug/L		0.02	16-JUL-19
Fluorene			<0.020		ug/L		0.02	16-JUL-19
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	16-JUL-19
Naphthalene			<0.050		ug/L		0.05	16-JUL-19
Phenanthrene			<0.020		ug/L		0.02	16-JUL-19
Pyrene			<0.020		ug/L		0.02	16-JUL-19
Surrogate: d8-Naphthalene			107.7		%		60-140	16-JUL-19
Surrogate: d10-Phenanthrene			98.3		%		60-140	16-JUL-19
Surrogate: d12-Chrysene			103.6		%		60-140	16-JUL-19
Surrogate: d10-Acenaphthene			103.8		%		60-140	16-JUL-19
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-4</b>	<b>DUP</b>		<b>WG3098658-3</b>					
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19



### Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-4</b>	<b>DUP</b>	<b>WG3098658-3</b>						
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	16-JUL-19
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	16-JUL-19
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	16-JUL-19
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	16-JUL-19
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	16-JUL-19
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	16-JUL-19
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	16-JUL-19
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	16-JUL-19
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	16-JUL-19
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	16-JUL-19
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	16-JUL-19
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	16-JUL-19
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	16-JUL-19
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	16-JUL-19
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	16-JUL-19
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Toluene		0.55	0.54		ug/L	1.8	30	16-JUL-19
trans-1,2-Dichloroethylene		<0.50	<0.50		ug/L			16-JUL-19



### Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-4 DUP</b>		<b>WG3098658-3</b>						
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	16-JUL-19
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	16-JUL-19
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	16-JUL-19
<b>WG3098658-1 LCS</b>								
1,1,1,2-Tetrachloroethane			115.1		%		70-130	16-JUL-19
1,1,2,2-Tetrachloroethane			107.5		%		70-130	16-JUL-19
1,1,1-Trichloroethane			106.8		%		70-130	16-JUL-19
1,1,2-Trichloroethane			106.9		%		70-130	16-JUL-19
1,1-Dichloroethane			102.1		%		70-130	16-JUL-19
1,1-Dichloroethylene			106.4		%		70-130	16-JUL-19
1,2-Dibromoethane			107.4		%		70-130	16-JUL-19
1,2-Dichlorobenzene			106.5		%		70-130	16-JUL-19
1,2-Dichloroethane			109.5		%		70-130	16-JUL-19
1,2-Dichloropropane			115.2		%		70-130	16-JUL-19
1,3-Dichlorobenzene			106.6		%		70-130	16-JUL-19
1,4-Dichlorobenzene			98.9		%		70-130	16-JUL-19
Acetone			112.6		%		60-140	16-JUL-19
Benzene			115.9		%		70-130	16-JUL-19
Bromodichloromethane			113.8		%		70-130	16-JUL-19
Bromoform			118.0		%		70-130	16-JUL-19
Bromomethane			112.4		%		60-140	16-JUL-19
Carbon tetrachloride			117.2		%		70-130	16-JUL-19
Chlorobenzene			107.8		%		70-130	16-JUL-19
Chloroform			116.9		%		70-130	16-JUL-19
cis-1,2-Dichloroethylene			105.1		%		70-130	16-JUL-19
cis-1,3-Dichloropropene			114.2		%		70-130	16-JUL-19
Dibromochloromethane			114.5		%		70-130	16-JUL-19
Dichlorodifluoromethane			80.7		%		50-140	16-JUL-19
Ethylbenzene			114.9		%		70-130	16-JUL-19
n-Hexane			113.2		%		70-130	16-JUL-19
m+p-Xylenes			114.8		%		70-130	16-JUL-19



### Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-1</b>	<b>LCS</b>							
Methyl Ethyl Ketone			99.6		%		60-140	16-JUL-19
Methyl Isobutyl Ketone			96.1		%		60-140	16-JUL-19
Methylene Chloride			110.6		%		70-130	16-JUL-19
MTBE			98.7		%		70-130	16-JUL-19
o-Xylene			112.2		%		70-130	16-JUL-19
Styrene			113.4		%		70-130	16-JUL-19
Tetrachloroethylene			110.1		%		70-130	16-JUL-19
Toluene			109.9		%		70-130	16-JUL-19
trans-1,2-Dichloroethylene			113.3		%		70-130	16-JUL-19
trans-1,3-Dichloropropene			110.6		%		70-130	16-JUL-19
Trichloroethylene			108.2		%		70-130	16-JUL-19
Trichlorofluoromethane			119.6		%		60-140	16-JUL-19
Vinyl chloride			107.2		%		60-140	16-JUL-19
<b>WG3098658-2</b>	<b>MB</b>							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	16-JUL-19
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	16-JUL-19
1,1,1-Trichloroethane			<0.50		ug/L		0.5	16-JUL-19
1,1,2-Trichloroethane			<0.50		ug/L		0.5	16-JUL-19
1,1-Dichloroethane			<0.50		ug/L		0.5	16-JUL-19
1,1-Dichloroethylene			<0.50		ug/L		0.5	16-JUL-19
1,2-Dibromoethane			<0.20		ug/L		0.2	16-JUL-19
1,2-Dichlorobenzene			<0.50		ug/L		0.5	16-JUL-19
1,2-Dichloroethane			<0.50		ug/L		0.5	16-JUL-19
1,2-Dichloropropane			<0.50		ug/L		0.5	16-JUL-19
1,3-Dichlorobenzene			<0.50		ug/L		0.5	16-JUL-19
1,4-Dichlorobenzene			<0.50		ug/L		0.5	16-JUL-19
Acetone			<30		ug/L		30	16-JUL-19
Benzene			<0.50		ug/L		0.5	16-JUL-19
Bromodichloromethane			<2.0		ug/L		2	16-JUL-19
Bromoform			<5.0		ug/L		5	16-JUL-19
Bromomethane			<0.50		ug/L		0.5	16-JUL-19
Carbon tetrachloride			<0.20		ug/L		0.2	16-JUL-19
Chlorobenzene			<0.50		ug/L		0.5	16-JUL-19
Chloroform			<1.0		ug/L		1	16-JUL-19





## Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-2 MB</b>								
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	16-JUL-19
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	16-JUL-19
Dibromochloromethane			<2.0		ug/L		2	16-JUL-19
Dichlorodifluoromethane			<2.0		ug/L		2	16-JUL-19
Ethylbenzene			<0.50		ug/L		0.5	16-JUL-19
n-Hexane			<0.50		ug/L		0.5	16-JUL-19
m+p-Xylenes			<0.40		ug/L		0.4	16-JUL-19
Methyl Ethyl Ketone			<20		ug/L		20	16-JUL-19
Methyl Isobutyl Ketone			<20		ug/L		20	16-JUL-19
Methylene Chloride			<5.0		ug/L		5	16-JUL-19
MTBE			<2.0		ug/L		2	16-JUL-19
o-Xylene			<0.30		ug/L		0.3	16-JUL-19
Styrene			<0.50		ug/L		0.5	16-JUL-19
Tetrachloroethylene			<0.50		ug/L		0.5	16-JUL-19
Toluene			<0.50		ug/L		0.5	16-JUL-19
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	16-JUL-19
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	16-JUL-19
Trichloroethylene			<0.50		ug/L		0.5	16-JUL-19
Trichlorofluoromethane			<5.0		ug/L		5	16-JUL-19
Vinyl chloride			<0.50		ug/L		0.5	16-JUL-19
Surrogate: 1,4-Difluorobenzene			98.1		%		70-130	16-JUL-19
Surrogate: 4-Bromofluorobenzene			96.3		%		70-130	16-JUL-19
<b>WG3098658-5 MS</b>		<b>WG3098658-3</b>						
1,1,1,2-Tetrachloroethane			113.0		%		50-140	16-JUL-19
1,1,2,2-Tetrachloroethane			101.1		%		50-140	16-JUL-19
1,1,1-Trichloroethane			108.6		%		50-140	16-JUL-19
1,1,2-Trichloroethane			102.5		%		50-140	16-JUL-19
1,1-Dichloroethane			104.7		%		50-140	16-JUL-19
1,1-Dichloroethylene			105.4		%		50-140	16-JUL-19
1,2-Dibromoethane			101.3		%		50-140	16-JUL-19
1,2-Dichlorobenzene			106.7		%		50-140	16-JUL-19
1,2-Dichloroethane			107.6		%		50-140	16-JUL-19
1,2-Dichloropropane			114.7		%		50-140	16-JUL-19
1,3-Dichlorobenzene			109.2		%		50-140	16-JUL-19



### Quality Control Report

Workorder: L2308539

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R4712563</b>							
<b>WG3098658-5 MS</b>		<b>WG3098658-3</b>						
1,4-Dichlorobenzene			102.5		%		50-140	16-JUL-19
Acetone			107.7		%		50-140	16-JUL-19
Benzene			116.3		%		50-140	16-JUL-19
Bromodichloromethane			114.1		%		50-140	16-JUL-19
Bromoform			111.6		%		50-140	16-JUL-19
Bromomethane			108.6		%		50-140	16-JUL-19
Carbon tetrachloride			119.6		%		50-140	16-JUL-19
Chlorobenzene			108.7		%		50-140	16-JUL-19
Chloroform			117.9		%		50-140	16-JUL-19
cis-1,2-Dichloroethylene			104.5		%		50-140	16-JUL-19
cis-1,3-Dichloropropene			115.4		%		50-140	16-JUL-19
Dibromochloromethane			110.7		%		50-140	16-JUL-19
Dichlorodifluoromethane			70.1		%		50-140	16-JUL-19
Ethylbenzene			113.6		%		50-140	16-JUL-19
n-Hexane			110.5		%		50-140	16-JUL-19
m+p-Xylenes			115.6		%		50-140	16-JUL-19
Methyl Ethyl Ketone			91.8		%		50-140	16-JUL-19
Methyl Isobutyl Ketone			87.6		%		50-140	16-JUL-19
Methylene Chloride			109.6		%		50-140	16-JUL-19
MTBE			98.7		%		50-140	16-JUL-19
o-Xylene			109.6		%		50-140	16-JUL-19
Styrene			109.5		%		50-140	16-JUL-19
Tetrachloroethylene			112.3		%		50-140	16-JUL-19
Toluene			108.2		%		50-140	16-JUL-19
trans-1,2-Dichloroethylene			114.9		%		50-140	16-JUL-19
trans-1,3-Dichloropropene			108.1		%		50-140	16-JUL-19
Trichloroethylene			111.1		%		50-140	16-JUL-19
Trichlorofluoromethane			117.3		%		50-140	16-JUL-19
Vinyl chloride			100.7		%		50-140	16-JUL-19

# Quality Control Report

Workorder: L2308539

Report Date: 16-OCT-19

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

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Contact: Pascal Renella

## Legend:

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Limit ALS Control Limit (Data Quality Objectives)  
DUP Duplicate  
RPD Relative Percent Difference  
N/A Not Available  
LCS Laboratory Control Sample  
SRM Standard Reference Material  
MS Matrix Spike  
MSD Matrix Spike Duplicate  
ADE Average Desorption Efficiency  
MB Method Blank  
IRM Internal Reference Material  
CRM Certified Reference Material  
CCV Continuing Calibration Verification  
CVS Calibration Verification Standard  
LCSD Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

---

## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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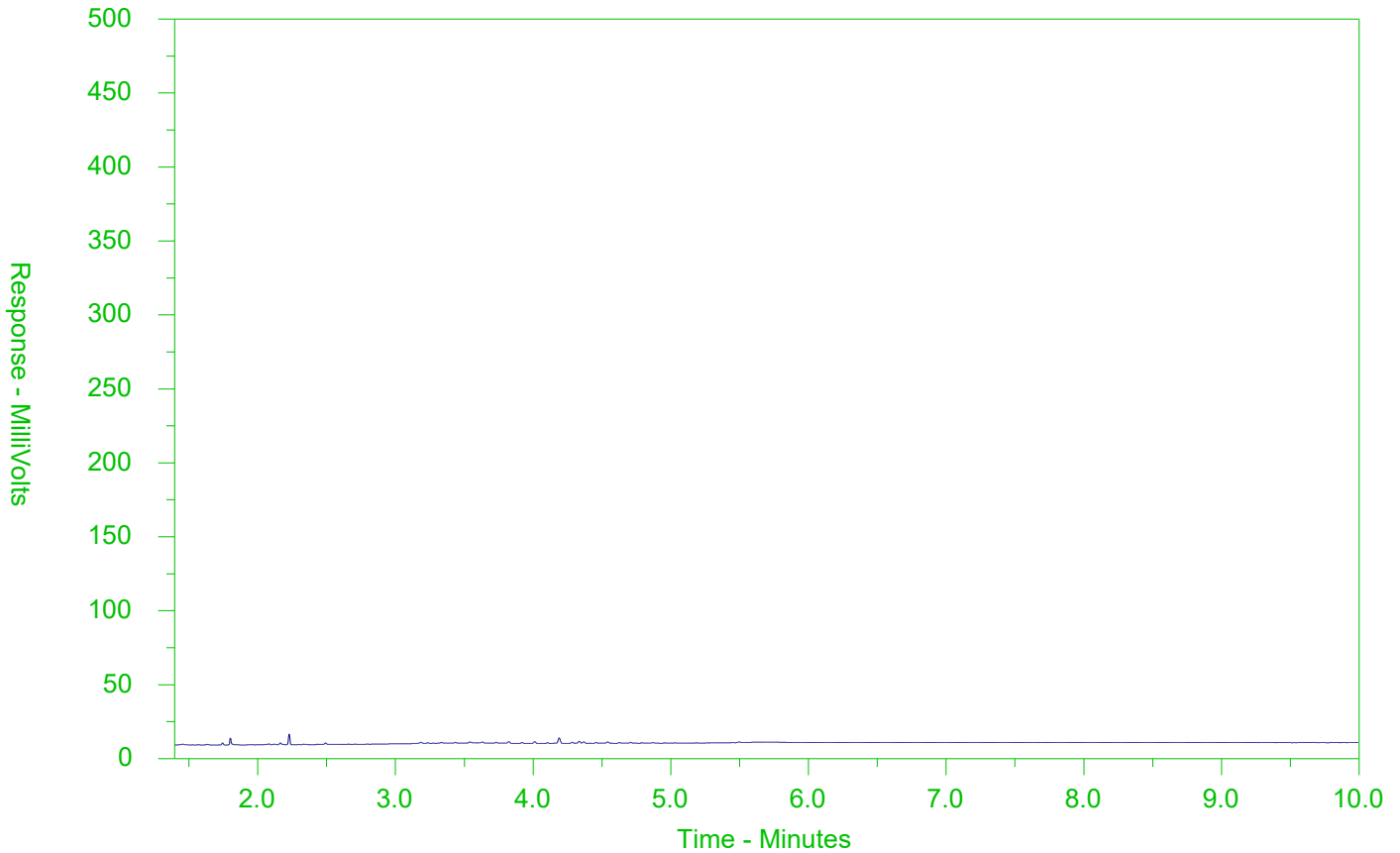
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2308539-1  
 Client Sample ID: GW-11196246-0711119-SO-MW4-19



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).



Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878



L2308539-COFC

COC Number: 17 - 822975

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*CP*

Report To		Report Format / Distribution			- Contact your AM to confirm all E&P TATs (surcharges may apply)	
Company:	GMD LIMITED	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Regular [R]	<input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply	
Contact:	PASCAL RENELLA	Quality Control (QC) Report with Report	<input type="checkbox"/> YES <input type="checkbox"/> NO	4 day [P4-20%]	<input type="checkbox"/>	1 Business day [E - 100%]
Phone:	519-884-0510	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked		3 day [P3-25%]	<input type="checkbox"/>	Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)]
Company address below will appear on the final report		Select Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	2 day [P2-50%]	<input type="checkbox"/>	
Street:	455 PHILLIP STREET	Email 1 or Fax	SAMS AS SO	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm		
City/Province:	WATERLOO, ON	Email 2	SEE PO	For tests that can not be performed according to the service level selected, you will be contacted.		
Postal Code:	N2L 3X2	Email 3		Analysis Request		
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below		
	Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	Select Invoice Distribution:	<input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	NUMBER OF CONTAINERS		
Company:		Email 1 or Fax	SEE PO	O.PEG 153 METALS		
Contact:		Email 2		PAHs		
Project Information		Oil and Gas Required Fields (client use)		NOCS		
ALS Account # / Quote #:		AFE/Cost Center:	PO#	PHCFI-FA		
Job #:		Major/Minor Code:	Routing Code:	VOCS/PHCFI		
PO / AFE:		Requisitioner:				
LSD:		Location:				
ALS Lab Work Order # (lab use only):	L2308539 <sup>29</sup>	ALS Contact:		SAMPLER: S.O.		
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type		
	GW-1196246-071119-SO-MW4-19	07 <sup>30</sup> 11-JUL-19	16:00	GW	X	X
	TRIP BLANK	11-JUL-19	-	W	X	X
Drinking Water (DW) Samples <sup>1</sup> (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)		SAMPLE CONDITION AS RECEIVED (lab use only)		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		METALS NOT FIELD FILTERED. PLEASE LAB FILTER. Metals / Cr <sup>6+</sup> / Hg on hold → not field filtered.		Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				Ice Packs <input type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		Cooling Initiated <input type="checkbox"/>		
Released by:	Date:	Time:	Received by:	Date:	Time:	INITIAL COOLER TEMPERATURES °C
S. ORMIG	07/11/2019	17:35		11/JUL/2019	17:40	9.0
FINAL SHIPMENT RECEPTION (lab use only)				FINAL COOLER TEMPERATURES °C		

SAMPLER: S.O.

SUSPECTED HAZARD (see Special Instructions)

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)  
ATTN: Pascal Renella  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Date Received: 15-JUL-19  
Report Date: 18-JUL-19 10:32 (MT)  
Version: FINAL

Client Phone: 450-973-4165

## Certificate of Analysis

Lab Work Order #: L2310028  
Project P.O. #: 73516171  
Job Reference: 11196246  
C of C Numbers: 17-823004  
Legal Site Desc:

Rick Hawthorne  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2310028-1 GW-11196246-071519-SO-MW4-19							
Sampled By: S.O. on 15-JUL-19 @ 14:30							
Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	LAB					16-JUL-19	R4712771
Dissolved Metals Filtration Location	LAB					16-JUL-19	R4712249
Antimony (Sb)-Dissolved	2.1	DLHC	1.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Barium (Ba)-Dissolved	246	DLHC	1.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Boron (B)-Dissolved	<100	DLHC	100	ug/L	16-JUL-19	16-JUL-19	R4713337
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	16-JUL-19	16-JUL-19	R4713337
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Copper (Cu)-Dissolved	2.3	DLHC	2.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	16-JUL-19	16-JUL-19	R4713337
Mercury (Hg)-Dissolved	0.025		0.010	ug/L	16-JUL-19	17-JUL-19	R4713573
Molybdenum (Mo)-Dissolved	6.00	DLHC	0.50	ug/L	16-JUL-19	16-JUL-19	R4713337
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Selenium (Se)-Dissolved	1.90	DLHC	0.50	ug/L	16-JUL-19	16-JUL-19	R4713337
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	16-JUL-19	16-JUL-19	R4713337
Sodium (Na)-Dissolved	604000	DLHC	500	ug/L	16-JUL-19	16-JUL-19	R4713337
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	16-JUL-19	16-JUL-19	R4713337
Uranium (U)-Dissolved	3.14	DLHC	0.10	ug/L	16-JUL-19	16-JUL-19	R4713337
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	16-JUL-19	16-JUL-19	R4713337
Zinc (Zn)-Dissolved	15	DLHC	10	ug/L	16-JUL-19	17-JUL-19	R4713337
<b>Speciated Metals</b>							
Chromium, Hexavalent	<0.50	SFP	0.50	ug/L		16-JUL-19	R4713381

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2310028-1
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2310028-1
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2310028-1

### Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
SFP	Sample was Filtered and Preserved at the laboratory

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
CR-CR6-IC-R511-WT	Water	Hex Chrom-O.Reg 153/04 (July 2011)	EPA 7199
<p>This analysis is carried out using procedure adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
HG-D-UG/L-CVAA-WT	Water	Diss. Mercury in Water by CVAAS (ug/L)	EPA 1631E (mod)
<p>Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).</p>			
MET-D-UG/L-MS-WT	Water	Diss. Metals in Water by ICPMS (ug/L)	EPA 200.8
<p>The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.</p> <p>Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).</p>			

\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.

*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

### Chain of Custody Numbers:

17-823004

### GLOSSARY OF REPORT TERMS

*Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.*

*mg/kg - milligrams per kilogram based on dry weight of sample*

*mg/kg wwt - milligrams per kilogram based on wet weight of sample*

*mg/kg lwt - milligrams per kilogram based on lipid weight of sample*

*mg/L - unit of concentration based on volume, parts per million.*

*< - Less than.*

*D.L. - The reporting limit.*

*N/A - Result not available. Refer to qualifier code and definition for explanation.*

*Test results reported relate only to the samples as received by the laboratory.*

*UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.*

*Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.*





### Quality Control Report

Workorder: L2310028

Report Date: 18-JUL-19

Page 1 of 4

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CR-CR6-IC-R511-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4713381</b>							
<b>WG3106588-4</b>	<b>DUP</b>	<b>WG3106588-3</b>						
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-JUL-19
<b>WG3106588-2</b>	<b>LCS</b>							
Chromium, Hexavalent			98.7		%		80-120	16-JUL-19
<b>WG3106588-1</b>	<b>MB</b>							
Chromium, Hexavalent			<0.50		ug/L		0.5	16-JUL-19
<b>WG3106588-5</b>	<b>MS</b>	<b>WG3106588-3</b>						
Chromium, Hexavalent			99.4		%		70-130	16-JUL-19
<b>HG-D-UG/L-CVAA-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4713573</b>							
<b>WG3106633-4</b>	<b>DUP</b>	<b>WG3106633-3</b>						
Mercury (Hg)-Dissolved		0.017	0.019		ug/L	7.3	20	17-JUL-19
<b>WG3106633-2</b>	<b>LCS</b>							
Mercury (Hg)-Dissolved			99.2		%		80-120	17-JUL-19
<b>WG3106633-1</b>	<b>MB</b>							
Mercury (Hg)-Dissolved			<0.010		ug/L		0.01	17-JUL-19
<b>WG3106633-6</b>	<b>MS</b>	<b>WG3106633-5</b>						
Mercury (Hg)-Dissolved			94.4		%		70-130	17-JUL-19
<b>MET-D-UG/L-MS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4713337</b>							
<b>WG3105950-4</b>	<b>DUP</b>	<b>WG3105950-3</b>						
Antimony (Sb)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	16-JUL-19
Arsenic (As)-Dissolved		0.62	0.57		ug/L	8.8	20	16-JUL-19
Barium (Ba)-Dissolved		108	105		ug/L	2.9	20	16-JUL-19
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	16-JUL-19
Boron (B)-Dissolved		181	181		ug/L	0.1	20	16-JUL-19
Cadmium (Cd)-Dissolved		<0.0050	<0.0050	RPD-NA	ug/L	N/A	20	16-JUL-19
Chromium (Cr)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-JUL-19
Cobalt (Co)-Dissolved		0.19	0.18		ug/L	2.8	20	16-JUL-19
Copper (Cu)-Dissolved		<0.20	<0.20	RPD-NA	ug/L	N/A	20	16-JUL-19
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	16-JUL-19
Molybdenum (Mo)-Dissolved		0.133	0.138		ug/L	3.4	20	16-JUL-19
Nickel (Ni)-Dissolved		<0.50	0.82	RPD-NA	ug/L	N/A	20	16-JUL-19
Selenium (Se)-Dissolved		0.211	0.199		ug/L	5.8	20	16-JUL-19
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	16-JUL-19
Sodium (Na)-Dissolved		13100	12700		ug/L	3.2	20	16-JUL-19



### Quality Control Report

Workorder: L2310028

Report Date: 18-JUL-19

Page 2 of 4

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4713337</b>							
<b>WG3105950-4</b>	<b>DUP</b>	<b>WG3105950-3</b>						
Thallium (Tl)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	16-JUL-19
Uranium (U)-Dissolved		0.073	0.073		ug/L	0.1	20	16-JUL-19
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-JUL-19
Zinc (Zn)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	17-JUL-19
<b>WG3105950-2</b>	<b>LCS</b>							
Antimony (Sb)-Dissolved			98.7		%		80-120	16-JUL-19
Arsenic (As)-Dissolved			99.1		%		80-120	16-JUL-19
Barium (Ba)-Dissolved			99.4		%		80-120	16-JUL-19
Beryllium (Be)-Dissolved			94.7		%		80-120	16-JUL-19
Boron (B)-Dissolved			91.7		%		80-120	16-JUL-19
Cadmium (Cd)-Dissolved			97.0		%		80-120	16-JUL-19
Chromium (Cr)-Dissolved			98.9		%		80-120	16-JUL-19
Cobalt (Co)-Dissolved			97.2		%		80-120	16-JUL-19
Copper (Cu)-Dissolved			97.4		%		80-120	16-JUL-19
Lead (Pb)-Dissolved			100.1		%		80-120	16-JUL-19
Molybdenum (Mo)-Dissolved			98.4		%		80-120	16-JUL-19
Nickel (Ni)-Dissolved			98.3		%		80-120	16-JUL-19
Selenium (Se)-Dissolved			94.6		%		80-120	16-JUL-19
Silver (Ag)-Dissolved			101.5		%		80-120	16-JUL-19
Sodium (Na)-Dissolved			99.7		%		80-120	16-JUL-19
Thallium (Tl)-Dissolved			99.4		%		80-120	16-JUL-19
Uranium (U)-Dissolved			101.5		%		80-120	16-JUL-19
Vanadium (V)-Dissolved			100.7		%		80-120	16-JUL-19
Zinc (Zn)-Dissolved			96.8		%		80-120	16-JUL-19
<b>WG3105950-1</b>	<b>MB</b>							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	16-JUL-19
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	16-JUL-19
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	16-JUL-19
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	16-JUL-19
Boron (B)-Dissolved			<10		ug/L		10	16-JUL-19
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	16-JUL-19
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	16-JUL-19
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	16-JUL-19
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	16-JUL-19



### Quality Control Report

Workorder: L2310028

Report Date: 18-JUL-19

Page 3 of 4

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4713337</b>							
<b>WG3105950-1 MB</b>								
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	16-JUL-19
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	16-JUL-19
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	16-JUL-19
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	16-JUL-19
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	16-JUL-19
Sodium (Na)-Dissolved			<50		ug/L		50	16-JUL-19
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	16-JUL-19
Uranium (U)-Dissolved			<0.010		ug/L		0.01	16-JUL-19
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	16-JUL-19
Zinc (Zn)-Dissolved			<1.0		ug/L		1	16-JUL-19
<b>WG3105950-5 MS</b>		<b>WG3105950-6</b>						
Antimony (Sb)-Dissolved			96.4		%		70-130	16-JUL-19
Arsenic (As)-Dissolved			99.9		%		70-130	16-JUL-19
Barium (Ba)-Dissolved			N/A	MS-B	%		-	16-JUL-19
Beryllium (Be)-Dissolved			94.9		%		70-130	16-JUL-19
Boron (B)-Dissolved			88.9		%		70-130	16-JUL-19
Cadmium (Cd)-Dissolved			98.4		%		70-130	16-JUL-19
Chromium (Cr)-Dissolved			95.6		%		70-130	16-JUL-19
Cobalt (Co)-Dissolved			93.4		%		70-130	16-JUL-19
Copper (Cu)-Dissolved			93.9		%		70-130	16-JUL-19
Lead (Pb)-Dissolved			96.3		%		70-130	16-JUL-19
Molybdenum (Mo)-Dissolved			96.9		%		70-130	16-JUL-19
Nickel (Ni)-Dissolved			92.8		%		70-130	16-JUL-19
Selenium (Se)-Dissolved			105.7		%		70-130	16-JUL-19
Silver (Ag)-Dissolved			95.7		%		70-130	16-JUL-19
Sodium (Na)-Dissolved			N/A	MS-B	%		-	16-JUL-19
Thallium (Tl)-Dissolved			97.2		%		70-130	16-JUL-19
Uranium (U)-Dissolved			N/A	MS-B	%		-	16-JUL-19
Vanadium (V)-Dissolved			97.0		%		70-130	16-JUL-19
Zinc (Zn)-Dissolved			98.5		%		70-130	16-JUL-19

# Quality Control Report

Workorder: L2310028

Report Date: 18-JUL-19

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Page 4 of 4

Contact: Pascal Renella

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

---

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

---

## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



L2310028-COFC

Report To		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																																																																																		
Company: <b>GHD LIMITED</b>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																																																																																																		
Contact: <b>PASCAL RENELLA</b>		Quality Control (QC) Report with Report <input type="checkbox"/> YES <input type="checkbox"/> NO			4 day [P4-20%] <input type="checkbox"/>		1 Business day [E - 100%] <input type="checkbox"/>																																																																																																
Phone: <b>519-884-0510</b>		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/>																																																																																																
Company address below will appear on the final report		Select Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			2 day [P2-50%] <input type="checkbox"/>		Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																																																																																																
Street: <b>455 PHILLIP STREET</b>		Email 1 or Fax <b>SEE PO</b>			For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																		
City/Province: <b>WATERLOO, ON</b>		Email 2			<table border="1"> <thead> <tr> <th colspan="10">Analysis Request</th> </tr> <tr> <th colspan="10">Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below</th> </tr> </thead> <tbody> <tr> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">3</td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">X</td> <td colspan="7"></td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">SAMPLES ON HOLD</td> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> <tr><td colspan="7"></td></tr> </tbody> </table>				Analysis Request										Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below										NUMBER OF CONTAINERS	3	X								SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																																																															
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Project Information		Oil and Gas Required Fields (client use)																																																																																																					
ALS Account # / Quote #		AFE/Cost Center:	PO#																																																																																																				
Job #: <b>11196246</b>		Major/Minor Code:	Routing Code:																																																																																																				
PO / AFE: <b>See PO</b>		Requisitioner:																																																																																																					
LSD:		Location:																																																																																																					
ALS Lab Work Order # (lab use only): <b>173012310028 JUL 15A</b>		ALS Contact:		Sampler: <b>S.O.</b>																																																																																																			
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type																																																																																																			
1	GW-11196246-071519-SO-MWA-19	15-Jul-19	14:30	GW																																																																																																			
Drinking Water (DW) Samples <sup>1</sup> (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)			SAMPLE CONDITION AS RECEIVED (lab use only)																																																																																																		
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		<b>METALS NOT FIELD FILTERED. PRESERVATIVE RINSED OUT BEFORE SAMPLE COLLECTED. PLEASE LAB FILTER</b>			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																		
Are samples for human consumption/ use? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO					Ice Packs <input type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																																																																																																		
		INITIAL COOLER TEMPERATURES °C		FINAL COOLER TEMPERATURES °C																																																																																																			
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SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)																																																																																																		
Released by: <b>S. ORNEL</b> Date: <b>07/15/2019</b> Time: <b>16:55</b>		Received by: _____ Date: _____ Time: _____			Received by: <b>PH</b> Date: <b>15-Jul-19</b> Time: <b>17:00</b>																																																																																																		

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



GHD Limited (Waterloo)  
ATTN: Pascal Renella  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Date Received: 13-SEP-19  
Report Date: 19-SEP-19 10:51 (MT)  
Version: FINAL

Client Phone: 450-973-4165

## Certificate of Analysis

Lab Work Order #: L2347004  
Project P.O. #: 73516171  
Job Reference: 11196246  
C of C Numbers:  
Legal Site Desc:

Rick Hawthorne  
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 60 Northland Road, Unit 1, Waterloo, ON N2V 2B8 Canada | Phone: +1 519 886 6910 | Fax: +1 519 886 9047  
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-1 GW-11196246-091319-TB-MW5-19							
Sampled By: T BRINDLE on 13-SEP-19 @ 11:40							
Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					16-SEP-19	R4808908
Dissolved Metals Filtration Location	FIELD					16-SEP-19	R4810374
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Barium (Ba)-Dissolved	98.6	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Boron (B)-Dissolved	<100	DLHC	100	ug/L	16-SEP-19	16-SEP-19	R4812849
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	16-SEP-19	16-SEP-19	R4812849
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Copper (Cu)-Dissolved	4.2	DLHC	2.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	16-SEP-19	16-SEP-19	R4810128
Molybdenum (Mo)-Dissolved	0.56	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Selenium (Se)-Dissolved	2.07	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Sodium (Na)-Dissolved	340000	DLHC	500	ug/L	16-SEP-19	16-SEP-19	R4812849
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Uranium (U)-Dissolved	0.42	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	16-SEP-19	16-SEP-19	R4812849
<b>Speciated Metals</b>							
Chromium, Hexavalent	<0.50		0.50	ug/L		16-SEP-19	R4813709
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		19-SEP-19	R4821769
Benzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Bromodichloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Bromoform	<5.0		5.0	ug/L		19-SEP-19	R4821769
Bromomethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Carbon tetrachloride	<0.20		0.20	ug/L		19-SEP-19	R4821769
Chlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dibromochloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Chloroform	<1.0		1.0	ug/L		19-SEP-19	R4821769
1,2-Dibromoethane	<0.20		0.20	ug/L		19-SEP-19	R4821769
1,2-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,3-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,4-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dichlorodifluoromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
1,1-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,2-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-1 GW-11196246-091319-TB-MW5-19							
Sampled By: T BRINDLE on 13-SEP-19 @ 11:40							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
1,1-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methylene Chloride	<5.0		5.0	ug/L		19-SEP-19	R4821769
1,2-Dichloropropane	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		19-SEP-19	
Ethylbenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
n-Hexane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methyl Ethyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
Methyl Isobutyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
MTBE	<2.0		2.0	ug/L		19-SEP-19	R4821769
Styrene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Tetrachloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Toluene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,2-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichlorofluoromethane	<5.0		5.0	ug/L		19-SEP-19	R4821769
Vinyl chloride	<0.50		0.50	ug/L		19-SEP-19	R4821769
o-Xylene	<0.30		0.30	ug/L		19-SEP-19	R4821769
m+p-Xylenes	<0.40		0.40	ug/L		19-SEP-19	R4821769
Xylenes (Total)	<0.50		0.50	ug/L		19-SEP-19	
Surrogate: 4-Bromofluorobenzene	99.3		70-130	%		19-SEP-19	R4821769
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		19-SEP-19	R4821769
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25		25	ug/L		19-SEP-19	R4821769
F1-BTEX	<25		25	ug/L		19-SEP-19	
F2 (C10-C16)	<100		100	ug/L	16-SEP-19	17-SEP-19	R4818469
F2-Naphth	<100		100	ug/L		19-SEP-19	
F3 (C16-C34)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
F3-PAH	<250		250	ug/L		19-SEP-19	
F4 (C34-C50)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
Total Hydrocarbons (C6-C50)	<370		370	ug/L		19-SEP-19	
Chrom. to baseline at nC50	YES				16-SEP-19	17-SEP-19	R4818469
Surrogate: 2-Bromobenzotrifluoride	89.0		60-140	%	16-SEP-19	17-SEP-19	R4818469
Surrogate: 3,4-Dichlorotoluene	78.0		60-140	%		19-SEP-19	R4821769
<b>Polycyclic Aromatic Hydrocarbons</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-1 GW-11196246-091319-TB-MW5-19 Sampled By: T BRINDLE on 13-SEP-19 @ 11:40 Matrix: WATER							
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Acenaphthylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)pyrene	<0.010		0.010	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(b)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(k)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Chrysene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluorene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		19-SEP-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
2-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Naphthalene	<0.050		0.050	ug/L	16-SEP-19	19-SEP-19	R4822617
Phenanthrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Acenaphthene	96.0		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d12-Chrysene	92.2		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d8-Naphthalene	96.7		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Phenanthrene	96.6		60-140	%	16-SEP-19	19-SEP-19	R4822617
L2347004-2 GW-11196246-091319-TB-MWX Sampled By: T BRINDLE on 13-SEP-19 @ 11:40 Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					16-SEP-19	R4808908
Dissolved Metals Filtration Location	FIELD					16-SEP-19	R4810374
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Barium (Ba)-Dissolved	95.6	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Boron (B)-Dissolved	<100	DLHC	100	ug/L	16-SEP-19	16-SEP-19	R4812849
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	16-SEP-19	16-SEP-19	R4812849
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	16-SEP-19	16-SEP-19	R4810128
Molybdenum (Mo)-Dissolved	0.68	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-2 GW-11196246-091319-TB-MWX Sampled By: T BRINDLE on 13-SEP-19 @ 11:40 Matrix: WATER							
<b>Dissolved Metals</b>							
Selenium (Se)-Dissolved	2.35	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Sodium (Na)-Dissolved	333000	DLHC	500	ug/L	16-SEP-19	16-SEP-19	R4812849
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Uranium (U)-Dissolved	0.39	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	16-SEP-19	16-SEP-19	R4812849
<b>Speciated Metals</b>							
Chromium, Hexavalent	0.56		0.50	ug/L		16-SEP-19	R4813709
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		19-SEP-19	R4821769
Benzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Bromodichloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Bromoform	<5.0		5.0	ug/L		19-SEP-19	R4821769
Bromomethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Carbon tetrachloride	<0.20		0.20	ug/L		19-SEP-19	R4821769
Chlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dibromochloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Chloroform	<1.0		1.0	ug/L		19-SEP-19	R4821769
1,2-Dibromoethane	<0.20		0.20	ug/L		19-SEP-19	R4821769
1,2-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,3-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,4-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dichlorodifluoromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
1,1-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,2-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methylene Chloride	<5.0		5.0	ug/L		19-SEP-19	R4821769
1,2-Dichloropropane	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		19-SEP-19	
Ethylbenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
n-Hexane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methyl Ethyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
Methyl Isobutyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
MTBE	<2.0		2.0	ug/L		19-SEP-19	R4821769
Styrene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-2 GW-11196246-091319-TB-MWX Sampled By: T BRINDLE on 13-SEP-19 @ 11:40 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Tetrachloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Toluene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,2-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichlorofluoromethane	<5.0		5.0	ug/L		19-SEP-19	R4821769
Vinyl chloride	<0.50		0.50	ug/L		19-SEP-19	R4821769
o-Xylene	<0.30		0.30	ug/L		19-SEP-19	R4821769
m+p-Xylenes	<0.40		0.40	ug/L		19-SEP-19	R4821769
Xylenes (Total)	<0.50		0.50	ug/L		19-SEP-19	
Surrogate: 4-Bromofluorobenzene	97.0		70-130	%		19-SEP-19	R4821769
Surrogate: 1,4-Difluorobenzene	100.1		70-130	%		19-SEP-19	R4821769
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25		25	ug/L		19-SEP-19	R4821769
F1-BTEX	<25		25	ug/L		19-SEP-19	
F2 (C10-C16)	<100		100	ug/L	16-SEP-19	17-SEP-19	R4818469
F2-Naphth	<100		100	ug/L		19-SEP-19	
F3 (C16-C34)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
F3-PAH	<250		250	ug/L		19-SEP-19	
F4 (C34-C50)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
Total Hydrocarbons (C6-C50)	<370		370	ug/L		19-SEP-19	
Chrom. to baseline at nC50	YES				16-SEP-19	17-SEP-19	R4818469
Surrogate: 2-Bromobenzotrifluoride	97.2		60-140	%	16-SEP-19	17-SEP-19	R4818469
Surrogate: 3,4-Dichlorotoluene	72.2		60-140	%		19-SEP-19	R4821769
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Acenaphthylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)pyrene	<0.010		0.010	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(b)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(k)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Chrysene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluorene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		19-SEP-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-2 GW-11196246-091319-TB-MWX Sampled By: T BRINDLE on 13-SEP-19 @ 11:40 Matrix: WATER							
<b>Polycyclic Aromatic Hydrocarbons</b>							
2-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Naphthalene	<0.050		0.050	ug/L	16-SEP-19	19-SEP-19	R4822617
Phenanthrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Acenaphthene	103.9		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d12-Chrysene	99.6		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d8-Naphthalene	104.4		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Phenanthrene	102.1		60-140	%	16-SEP-19	19-SEP-19	R4822617
L2347004-3 GW-11196246-091319-TB-MW6-19 Sampled By: T BRINDLE on 13-SEP-19 @ 13:25 Matrix: WATER							
<b>Dissolved Metals</b>							
Dissolved Mercury Filtration Location	FIELD					16-SEP-19	R4808908
Dissolved Metals Filtration Location	FIELD					16-SEP-19	R4810374
Antimony (Sb)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Arsenic (As)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Barium (Ba)-Dissolved	134	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Beryllium (Be)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Boron (B)-Dissolved	<100	DLHC	100	ug/L	16-SEP-19	16-SEP-19	R4812849
Cadmium (Cd)-Dissolved	<0.050	DLHC	0.050	ug/L	16-SEP-19	16-SEP-19	R4812849
Chromium (Cr)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Cobalt (Co)-Dissolved	<1.0	DLHC	1.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Copper (Cu)-Dissolved	<2.0	DLHC	2.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Lead (Pb)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Mercury (Hg)-Dissolved	<0.0050		0.0050	ug/L	16-SEP-19	16-SEP-19	R4810128
Molybdenum (Mo)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Nickel (Ni)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Selenium (Se)-Dissolved	1.21	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Silver (Ag)-Dissolved	<0.50	DLHC	0.50	ug/L	16-SEP-19	16-SEP-19	R4812849
Sodium (Na)-Dissolved	764000	DLHC	500	ug/L	16-SEP-19	16-SEP-19	R4812849
Thallium (Tl)-Dissolved	<0.10	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Uranium (U)-Dissolved	0.50	DLHC	0.10	ug/L	16-SEP-19	16-SEP-19	R4812849
Vanadium (V)-Dissolved	<5.0	DLHC	5.0	ug/L	16-SEP-19	16-SEP-19	R4812849
Zinc (Zn)-Dissolved	<10	DLHC	10	ug/L	16-SEP-19	16-SEP-19	R4812849
<b>Speciated Metals</b>							
Chromium, Hexavalent	2.14		0.50	ug/L		16-SEP-19	R4813709
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		19-SEP-19	R4821769
Benzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Bromodichloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Bromoform	<5.0		5.0	ug/L		19-SEP-19	R4821769
Bromomethane	<0.50		0.50	ug/L		19-SEP-19	R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-3 GW-11196246-091319-TB-MW6-19							
Sampled By: T BRINDLE on 13-SEP-19 @ 13:25							
Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Carbon tetrachloride	<0.20		0.20	ug/L		19-SEP-19	R4821769
Chlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dibromochloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Chloroform	<1.0		1.0	ug/L		19-SEP-19	R4821769
1,2-Dibromoethane	<0.20		0.20	ug/L		19-SEP-19	R4821769
1,2-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,3-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,4-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dichlorodifluoromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
1,1-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,2-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methylene Chloride	<5.0		5.0	ug/L		19-SEP-19	R4821769
1,2-Dichloropropane	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		19-SEP-19	R4821769
Ethylbenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
n-Hexane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methyl Ethyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
Methyl Isobutyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
MTBE	<2.0		2.0	ug/L		19-SEP-19	R4821769
Styrene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Tetrachloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Toluene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,2-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichlorofluoromethane	<5.0		5.0	ug/L		19-SEP-19	R4821769
Vinyl chloride	<0.50		0.50	ug/L		19-SEP-19	R4821769
o-Xylene	<0.30		0.30	ug/L		19-SEP-19	R4821769
m+p-Xylenes	<0.40		0.40	ug/L		19-SEP-19	R4821769
Xylenes (Total)	<0.50		0.50	ug/L		19-SEP-19	R4821769
Surrogate: 4-Bromofluorobenzene	98.7		70-130	%		19-SEP-19	R4821769
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		19-SEP-19	R4821769
<b>Hydrocarbons</b>							
F1 (C6-C10)	<25		25	ug/L		19-SEP-19	R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-3 GW-11196246-091319-TB-MW6-19 Sampled By: T BRINDLE on 13-SEP-19 @ 13:25 Matrix: WATER							
<b>Hydrocarbons</b>							
F1-BTEX	<25		25	ug/L		19-SEP-19	
F2 (C10-C16)	<100		100	ug/L	16-SEP-19	17-SEP-19	R4818469
F2-Naphth	<100		100	ug/L		19-SEP-19	
F3 (C16-C34)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
F3-PAH	<250		250	ug/L		19-SEP-19	
F4 (C34-C50)	<250		250	ug/L	16-SEP-19	17-SEP-19	R4818469
Total Hydrocarbons (C6-C50)	<370		370	ug/L		19-SEP-19	
Chrom. to baseline at nC50	YES				16-SEP-19	17-SEP-19	R4818469
Surrogate: 2-Bromobenzotrifluoride	92.5		60-140	%	16-SEP-19	17-SEP-19	R4818469
Surrogate: 3,4-Dichlorotoluene	75.2		60-140	%		19-SEP-19	R4821769
<b>Polycyclic Aromatic Hydrocarbons</b>							
Acenaphthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Acenaphthylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(a)pyrene	<0.010		0.010	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(b)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(g,h,i)perylene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Benzo(k)fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Chrysene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Dibenzo(ah)anthracene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluoranthene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Fluorene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Indeno(1,2,3-cd)pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
1+2-Methylnaphthalenes	<0.028		0.028	ug/L		19-SEP-19	
1-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
2-Methylnaphthalene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Naphthalene	<0.050		0.050	ug/L	16-SEP-19	19-SEP-19	R4822617
Phenanthrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Pyrene	<0.020		0.020	ug/L	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Acenaphthene	96.5		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d12-Chrysene	90.6		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d8-Naphthalene	100.0		60-140	%	16-SEP-19	19-SEP-19	R4822617
Surrogate: d10-Phenanthrene	95.5		60-140	%	16-SEP-19	19-SEP-19	R4822617
L2347004-4 TRIP BLANK Sampled By: T BRINDLE on 13-SEP-19 @ 12:00 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Acetone	<30		30	ug/L		19-SEP-19	R4821769
Benzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Bromodichloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Bromoform	<5.0		5.0	ug/L		19-SEP-19	R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

## ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-4 TRIP BLANK Sampled By: T BRINDLE on 13-SEP-19 @ 12:00 Matrix: WATER							
<b>Volatile Organic Compounds</b>							
Bromomethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Carbon tetrachloride	<0.20		0.20	ug/L		19-SEP-19	R4821769
Chlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dibromochloromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
Chloroform	<1.0		1.0	ug/L		19-SEP-19	R4821769
1,2-Dibromoethane	<0.20		0.20	ug/L		19-SEP-19	R4821769
1,2-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,3-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,4-Dichlorobenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Dichlorodifluoromethane	<2.0		2.0	ug/L		19-SEP-19	R4821769
1,1-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,2-Dichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methylene Chloride	<5.0		5.0	ug/L		19-SEP-19	R4821769
1,2-Dichloropropane	<0.50		0.50	ug/L		19-SEP-19	R4821769
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		19-SEP-19	R4821769
1,3-Dichloropropene (cis & trans)	<0.50		0.50	ug/L		19-SEP-19	
Ethylbenzene	<0.50		0.50	ug/L		19-SEP-19	R4821769
n-Hexane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Methyl Ethyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
Methyl Isobutyl Ketone	<20		20	ug/L		19-SEP-19	R4821769
MTBE	<2.0		2.0	ug/L		19-SEP-19	R4821769
Styrene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Tetrachloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Toluene	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,1-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
1,1,2-Trichloroethane	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichloroethylene	<0.50		0.50	ug/L		19-SEP-19	R4821769
Trichlorofluoromethane	<5.0		5.0	ug/L		19-SEP-19	R4821769
Vinyl chloride	<0.50		0.50	ug/L		19-SEP-19	R4821769
o-Xylene	<0.30		0.30	ug/L		19-SEP-19	R4821769
m+p-Xylenes	<0.40		0.40	ug/L		19-SEP-19	R4821769
Xylenes (Total)	<0.50		0.50	ug/L		19-SEP-19	
Surrogate: 4-Bromofluorobenzene	98.4		70-130	%		19-SEP-19	R4821769
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		19-SEP-19	R4821769
<b>Hydrocarbons</b>							

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.

# ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2347004-4 TRIP BLANK Sampled By: T BRINDLE on 13-SEP-19 @ 12:00 Matrix: WATER  <b>Hydrocarbons</b> F1 (C6-C10) F1-BTEX Surrogate: 3,4-Dichlorotoluene	    <25 <25 85.2	        	    25 25 60-140	    ug/L ug/L %	        	    19-SEP-19 19-SEP-19 19-SEP-19	    R4821769  R4821769

\* Refer to Referenced Information for Qualifiers (if any) and Methodology.



## Reference Information

### QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Barium (Ba)-Dissolved	MS-B	L2347004-1, -2, -3
Matrix Spike	Boron (B)-Dissolved	MS-B	L2347004-1, -2, -3
Matrix Spike	Sodium (Na)-Dissolved	MS-B	L2347004-1, -2, -3
Matrix Spike	Uranium (U)-Dissolved	MS-B	L2347004-1, -2, -3

### Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

### Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
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CR-CR6-IC-R511-WT      Water      Hex Chrom-O.Reg 153/04 (July 2011)      EPA 7199  
 This analysis is carried out using procedure adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 7199, published by the United States Environmental Protection Agency (EPA). The procedure involves analysis for chromium (VI) by ion chromatography using diphenylcarbazide in a sulphuric acid solution. Chromium (III) is calculated as the difference between the total chromium and the chromium (VI) results.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

F1-F4-511-CALC-WT      Water      F1-F4 Hydrocarbon Calculated Parameters      CCME CWS-PHC, Pub #1310, Dec 2001-L

Analytical methods used for analysis of CCME Petroleum Hydrocarbons have been validated and comply with the Reference Method for the CWS PHC.

In cases where results for both F4 and F4G are reported, the greater of the two results must be used in any application of the CWS PHC guidelines and the gravimetric heavy hydrocarbons cannot be added to the C6 to C50 hydrocarbons.

In samples where BTEX and F1 were analyzed, F1-BTEX represents a value where the sum of Benzene, Toluene, Ethylbenzene and total Xylenes has been subtracted from F1.

In samples where PAHs, F2 and F3 were analyzed, F2-Naphth represents the result where Naphthalene has been subtracted from F2. F3-PAH represents a result where the sum of Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Dibenzo(a,h)anthracene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Phenanthrene, and Pyrene has been subtracted from F3.

Unless otherwise qualified, the following quality control criteria have been met for the F1 hydrocarbon range:

1. All extraction and analysis holding times were met.
2. Instrument performance showing response factors for C6 and C10 within 30% of the response factor for toluene.
3. Linearity of gasoline response within 15% throughout the calibration range.

Unless otherwise qualified, the following quality control criteria have been met for the F2-F4 hydrocarbon ranges:

1. All extraction and analysis holding times were met.
2. Instrument performance showing C10, C16 and C34 response factors within 10% of their average.
3. Instrument performance showing the C50 response factor within 30% of the average of the C10, C16 and C34 response factors.
4. Linearity of diesel or motor oil response within 15% throughout the calibration range.

F1-HS-511-WT      Water      F1-O.Reg 153/04 (July 2011)      E3398/CCME TIER 1-HS

Fraction F1 is determined by analyzing by headspace-GC/FID.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

F2-F4-511-WT      Water      F2-F4-O.Reg 153/04 (July 2011)      EPA 3511/CCME Tier 1

Petroleum Hydrocarbons (F2-F4 fractions) are extracted from water using a hexane micro-extraction technique. Instrumental analysis is by GC-FID, as per the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Tier 1 Method, CCME, 2001.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

HG-D-UG/L-CVAA-WT      Water      Diss. Mercury in Water by CVAAS (ug/L)      EPA 1631E (mod)

Water samples are filtered (0.45 um), preserved with hydrochloric acid, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011).

MET-D-UG/L-MS-WT      Water      Diss. Metals in Water by ICPMS (ug/L)      EPA 200.8

The metal constituents of a non-acidified sample that pass through a membrane filter prior to ICP/MS analysis.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental

# Reference Information

Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

METHYLNAPS-CALC-WT    Water            PAH-Calculated Parameters            SW846 8270

PAH-511-WT                    Water            PAH-O. Reg 153/04 (July 2011)            SW846 3510/8270

Aqueous samples, fortified with surrogates, are extracted using liquid/liquid extraction technique. The sample extracts are concentrated and then analyzed using GC/MS. Results for benzo(b) fluoranthene may include contributions from benzo(j)fluoranthene, if also present in the sample.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

VOC-1,3-DCP-CALC-WT    Water            Regulation 153 VOCs            SW8260B/SW8270C

VOC-511-HS-WT            Water            VOC by GCMS HS O.Reg 153/04 (July 2011)            SW846 8260

Liquid samples are analyzed by headspace GC/MSD.

Analysis conducted in accordance with the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act (July 1, 2011), unless a subset of the Analytical Test Group (ATG) has been requested (the Protocol states that all analytes in an ATG must be reported).

XYLENES-SUM-CALC-WT    Water            Sum of Xylene Isomer Concentrations            CALCULATION

Total xylenes represents the sum of o-xylene and m&p-xylene.

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**\*\* ALS test methods may incorporate modifications from specified reference methods to improve performance.**

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*The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:*

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Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA

---

**Chain of Custody Numbers:**

**GLOSSARY OF REPORT TERMS**

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid weight of sample

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>CR-CR6-IC-R511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4813709</b>							
<b>WG3163034-4</b>	<b>DUP</b>	<b>WG3163034-3</b>						
Chromium, Hexavalent		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-SEP-19
<b>WG3163034-2</b>	<b>LCS</b>							
Chromium, Hexavalent			98.8		%		80-120	16-SEP-19
<b>WG3163034-1</b>	<b>MB</b>							
Chromium, Hexavalent			<0.50		ug/L		0.5	16-SEP-19
<b>WG3163034-5</b>	<b>MS</b>	<b>WG3163034-3</b>						
Chromium, Hexavalent			91.2		%		70-130	16-SEP-19
<b>F1-HS-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-4</b>	<b>DUP</b>	<b>WG3163973-3</b>						
F1 (C6-C10)		<25	<25	RPD-NA	ug/L	N/A	30	19-SEP-19
<b>WG3163973-1</b>	<b>LCS</b>							
F1 (C6-C10)			94.3		%		80-120	18-SEP-19
<b>WG3163973-2</b>	<b>MB</b>							
F1 (C6-C10)			<25		ug/L		25	19-SEP-19
Surrogate: 3,4-Dichlorotoluene			84.8		%		60-140	19-SEP-19
<b>WG3163973-5</b>	<b>MS</b>	<b>WG3163973-3</b>						
F1 (C6-C10)			84.0		%		60-140	19-SEP-19
<b>F2-F4-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4818469</b>							
<b>WG3163002-2</b>	<b>LCS</b>							
F2 (C10-C16)			112.0		%		70-130	17-SEP-19
F3 (C16-C34)			117.9		%		70-130	17-SEP-19
F4 (C34-C50)			110.1		%		70-130	17-SEP-19
<b>WG3163002-1</b>	<b>MB</b>							
F2 (C10-C16)			<100		ug/L		100	17-SEP-19
F3 (C16-C34)			<250		ug/L		250	17-SEP-19
F4 (C34-C50)			<250		ug/L		250	17-SEP-19
Surrogate: 2-Bromobenzotrifluoride			88.4		%		60-140	17-SEP-19
<b>HG-D-UG/L-CVAA-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4810128</b>							
<b>WG3162486-4</b>	<b>DUP</b>	<b>WG3162486-3</b>						
Mercury (Hg)-Dissolved		<0.0050	<0.0050	RPD-NA	ug/L	N/A	20	16-SEP-19
<b>WG3162486-2</b>	<b>LCS</b>							
Mercury (Hg)-Dissolved			98.5		%		80-120	16-SEP-19
<b>WG3162486-1</b>	<b>MB</b>							



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>HG-D-UG/L-CVAA-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4810128</b>							
<b>WG3162486-1</b>	<b>MB</b>							
Mercury (Hg)-Dissolved			<0.0050		ug/L		0.005	16-SEP-19
<b>WG3162486-6</b>	<b>MS</b>	<b>WG3162486-5</b>						
Mercury (Hg)-Dissolved			96.6		%		70-130	16-SEP-19
<b>MET-D-UG/L-MS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4812849</b>							
<b>WG3162964-4</b>	<b>DUP</b>	<b>WG3162964-3</b>						
Antimony (Sb)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	16-SEP-19
Arsenic (As)-Dissolved		0.17	0.17		ug/L	1.8	20	16-SEP-19
Barium (Ba)-Dissolved		25.0	25.8		ug/L	3.3	20	16-SEP-19
Beryllium (Be)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	16-SEP-19
Boron (B)-Dissolved		52	53		ug/L	1.4	20	16-SEP-19
Cadmium (Cd)-Dissolved		<0.0050	<0.0050	RPD-NA	ug/L	N/A	20	16-SEP-19
Chromium (Cr)-Dissolved		1.74	1.70		ug/L	2.2	20	16-SEP-19
Cobalt (Co)-Dissolved		<0.10	<0.10	RPD-NA	ug/L	N/A	20	16-SEP-19
Copper (Cu)-Dissolved		0.35	0.34		ug/L	2.4	20	16-SEP-19
Lead (Pb)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	16-SEP-19
Molybdenum (Mo)-Dissolved		0.251	0.274		ug/L	8.9	20	16-SEP-19
Nickel (Ni)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-SEP-19
Selenium (Se)-Dissolved		2.32	2.28		ug/L	1.9	20	16-SEP-19
Silver (Ag)-Dissolved		<0.050	<0.050	RPD-NA	ug/L	N/A	20	16-SEP-19
Sodium (Na)-Dissolved		28300	29000		ug/L	2.3	20	16-SEP-19
Thallium (Tl)-Dissolved		<0.010	<0.010	RPD-NA	ug/L	N/A	20	16-SEP-19
Uranium (U)-Dissolved		0.335	0.345		ug/L	3.0	20	16-SEP-19
Vanadium (V)-Dissolved		<0.50	<0.50	RPD-NA	ug/L	N/A	20	16-SEP-19
Zinc (Zn)-Dissolved		<1.0	<1.0	RPD-NA	ug/L	N/A	20	16-SEP-19
<b>WG3162964-2</b>	<b>LCS</b>							
Antimony (Sb)-Dissolved			96.6		%		80-120	16-SEP-19
Arsenic (As)-Dissolved			97.3		%		80-120	16-SEP-19
Barium (Ba)-Dissolved			95.5		%		80-120	16-SEP-19
Beryllium (Be)-Dissolved			101.9		%		80-120	16-SEP-19
Boron (B)-Dissolved			99.8		%		80-120	16-SEP-19
Cadmium (Cd)-Dissolved			97.4		%		80-120	16-SEP-19
Chromium (Cr)-Dissolved			94.2		%		80-120	16-SEP-19



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4812849</b>							
<b>WG3162964-2</b>	<b>LCS</b>							
Cobalt (Co)-Dissolved			97.0		%		80-120	16-SEP-19
Copper (Cu)-Dissolved			96.1		%		80-120	16-SEP-19
Lead (Pb)-Dissolved			97.0		%		80-120	16-SEP-19
Molybdenum (Mo)-Dissolved			97.1		%		80-120	16-SEP-19
Nickel (Ni)-Dissolved			95.9		%		80-120	16-SEP-19
Selenium (Se)-Dissolved			95.2		%		80-120	16-SEP-19
Silver (Ag)-Dissolved			97.6		%		80-120	16-SEP-19
Sodium (Na)-Dissolved			98.3		%		80-120	16-SEP-19
Thallium (Tl)-Dissolved			100.6		%		80-120	16-SEP-19
Uranium (U)-Dissolved			96.6		%		80-120	16-SEP-19
Vanadium (V)-Dissolved			97.3		%		80-120	16-SEP-19
Zinc (Zn)-Dissolved			97.1		%		80-120	16-SEP-19
<b>WG3162964-1</b>	<b>MB</b>							
Antimony (Sb)-Dissolved			<0.10		ug/L		0.1	16-SEP-19
Arsenic (As)-Dissolved			<0.10		ug/L		0.1	16-SEP-19
Barium (Ba)-Dissolved			<0.10		ug/L		0.1	16-SEP-19
Beryllium (Be)-Dissolved			<0.10		ug/L		0.1	16-SEP-19
Boron (B)-Dissolved			<10		ug/L		10	16-SEP-19
Cadmium (Cd)-Dissolved			<0.0050		ug/L		0.005	16-SEP-19
Chromium (Cr)-Dissolved			<0.50		ug/L		0.5	16-SEP-19
Cobalt (Co)-Dissolved			<0.10		ug/L		0.1	16-SEP-19
Copper (Cu)-Dissolved			<0.20		ug/L		0.2	16-SEP-19
Lead (Pb)-Dissolved			<0.050		ug/L		0.05	16-SEP-19
Molybdenum (Mo)-Dissolved			<0.050		ug/L		0.05	16-SEP-19
Nickel (Ni)-Dissolved			<0.50		ug/L		0.5	16-SEP-19
Selenium (Se)-Dissolved			<0.050		ug/L		0.05	16-SEP-19
Silver (Ag)-Dissolved			<0.050		ug/L		0.05	16-SEP-19
Sodium (Na)-Dissolved			<50		ug/L		50	16-SEP-19
Thallium (Tl)-Dissolved			<0.010		ug/L		0.01	16-SEP-19
Uranium (U)-Dissolved			<0.010		ug/L		0.01	16-SEP-19
Vanadium (V)-Dissolved			<0.50		ug/L		0.5	16-SEP-19
Zinc (Zn)-Dissolved			<1.0		ug/L		1	16-SEP-19
<b>WG3162964-5</b>	<b>MS</b>	<b>WG3162964-6</b>						
Antimony (Sb)-Dissolved			90.1		%		70-130	16-SEP-19



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>MET-D-UG/L-MS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4812849</b>							
<b>WG3162964-5 MS</b>		<b>WG3162964-6</b>						
Arsenic (As)-Dissolved			97.9		%		70-130	16-SEP-19
Barium (Ba)-Dissolved			N/A	MS-B	%		-	16-SEP-19
Beryllium (Be)-Dissolved			98.3		%		70-130	16-SEP-19
Boron (B)-Dissolved			N/A	MS-B	%		-	16-SEP-19
Cadmium (Cd)-Dissolved			94.9		%		70-130	16-SEP-19
Chromium (Cr)-Dissolved			93.8		%		70-130	16-SEP-19
Cobalt (Co)-Dissolved			92.2		%		70-130	16-SEP-19
Copper (Cu)-Dissolved			89.7		%		70-130	16-SEP-19
Lead (Pb)-Dissolved			91.0		%		70-130	16-SEP-19
Molybdenum (Mo)-Dissolved			96.0		%		70-130	16-SEP-19
Nickel (Ni)-Dissolved			91.0		%		70-130	16-SEP-19
Selenium (Se)-Dissolved			101.5		%		70-130	16-SEP-19
Silver (Ag)-Dissolved			91.3		%		70-130	16-SEP-19
Sodium (Na)-Dissolved			N/A	MS-B	%		-	16-SEP-19
Thallium (Tl)-Dissolved			95.4		%		70-130	16-SEP-19
Uranium (U)-Dissolved			N/A	MS-B	%		-	16-SEP-19
Vanadium (V)-Dissolved			97.5		%		70-130	16-SEP-19
Zinc (Zn)-Dissolved			89.9		%		70-130	16-SEP-19
<b>PAH-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4822617</b>							
<b>WG3163002-2 LCS</b>								
1-Methylnaphthalene			97.4		%		50-140	19-SEP-19
2-Methylnaphthalene			91.4		%		50-140	19-SEP-19
Acenaphthene			102.6		%		50-140	19-SEP-19
Acenaphthylene			103.9		%		50-140	19-SEP-19
Anthracene			100.7		%		50-140	19-SEP-19
Benzo(a)anthracene			113.2		%		50-140	19-SEP-19
Benzo(a)pyrene			100.5		%		50-140	19-SEP-19
Benzo(b)fluoranthene			105.1		%		50-140	19-SEP-19
Benzo(g,h,i)perylene			113.3		%		50-140	19-SEP-19
Benzo(k)fluoranthene			111.3		%		50-140	19-SEP-19
Chrysene			113.4		%		50-140	19-SEP-19
Dibenzo(ah)anthracene			101.4		%		50-140	19-SEP-19
Fluoranthene			104.6		%		50-140	19-SEP-19



## Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>PAH-511-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4822617</b>							
<b>WG3163002-2</b>	<b>LCS</b>							
Fluoranthene			104.6		%		50-140	19-SEP-19
Fluorene			101.1		%		50-140	19-SEP-19
Indeno(1,2,3-cd)pyrene			116.4		%		50-140	19-SEP-19
Naphthalene			98.6		%		50-140	19-SEP-19
Phenanthrene			105.9		%		50-140	19-SEP-19
Pyrene			106.6		%		50-140	19-SEP-19
<b>WG3163002-1</b>	<b>MB</b>							
1-Methylnaphthalene			<0.020		ug/L		0.02	18-SEP-19
2-Methylnaphthalene			<0.020		ug/L		0.02	18-SEP-19
Acenaphthene			<0.020		ug/L		0.02	18-SEP-19
Acenaphthylene			<0.020		ug/L		0.02	18-SEP-19
Anthracene			<0.020		ug/L		0.02	18-SEP-19
Benzo(a)anthracene			<0.020		ug/L		0.02	18-SEP-19
Benzo(a)pyrene			<0.010		ug/L		0.01	18-SEP-19
Benzo(b)fluoranthene			<0.020		ug/L		0.02	18-SEP-19
Benzo(g,h,i)perylene			<0.020		ug/L		0.02	18-SEP-19
Benzo(k)fluoranthene			<0.020		ug/L		0.02	18-SEP-19
Chrysene			<0.020		ug/L		0.02	18-SEP-19
Dibenzo(ah)anthracene			<0.020		ug/L		0.02	18-SEP-19
Fluoranthene			<0.020		ug/L		0.02	18-SEP-19
Fluorene			<0.020		ug/L		0.02	18-SEP-19
Indeno(1,2,3-cd)pyrene			<0.020		ug/L		0.02	18-SEP-19
Naphthalene			<0.050		ug/L		0.05	18-SEP-19
Phenanthrene			<0.020		ug/L		0.02	18-SEP-19
Pyrene			<0.020		ug/L		0.02	18-SEP-19
Surrogate: d8-Naphthalene			102.0		%		60-140	18-SEP-19
Surrogate: d10-Phenanthrene			101.2		%		60-140	18-SEP-19
Surrogate: d12-Chrysene			107.1		%		60-140	18-SEP-19
Surrogate: d10-Acenaphthene			100.6		%		60-140	18-SEP-19
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-4</b>	<b>DUP</b>	<b>WG3163973-3</b>						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-4</b>	<b>DUP</b>	<b>WG3163973-3</b>						
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	19-SEP-19
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Acetone		<30	<30	RPD-NA	ug/L	N/A	30	19-SEP-19
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Bromodichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	19-SEP-19
Bromoform		<5.0	<5.0	RPD-NA	ug/L	N/A	30	19-SEP-19
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	19-SEP-19
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	19-SEP-19
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-SEP-19
Dibromochloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	19-SEP-19
Dichlorodifluoromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	19-SEP-19
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	19-SEP-19
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	19-SEP-19
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	19-SEP-19
Methylene Chloride		<5.0	<5.0	RPD-NA	ug/L	N/A	30	19-SEP-19
MTBE		<2.0	<2.0	RPD-NA	ug/L	N/A	30	19-SEP-19
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-SEP-19
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Toluene		<0.50	<0.50		ug/L			19-SEP-19





## Quality Control Report

Workorder: L2347004

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Client: GHD Limited (Waterloo)  
 3061, rue Joseph-A Bombardier  
 Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-4</b>	<b>DUP</b>	<b>WG3163973-3</b>						
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	19-SEP-19
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
Trichlorofluoromethane		<5.0	<5.0	RPD-NA	ug/L	N/A	30	19-SEP-19
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	19-SEP-19
<b>WG3163973-1</b>	<b>LCS</b>							
1,1,1,2-Tetrachloroethane			96.1		%		70-130	18-SEP-19
1,1,1,2-Tetrachloroethane			92.0		%		70-130	18-SEP-19
1,1,1-Trichloroethane			95.5		%		70-130	18-SEP-19
1,1,2-Trichloroethane			97.3		%		70-130	18-SEP-19
1,1-Dichloroethane			97.3		%		70-130	18-SEP-19
1,1-Dichloroethylene			87.9		%		70-130	18-SEP-19
1,2-Dibromoethane			96.7		%		70-130	18-SEP-19
1,2-Dichlorobenzene			92.4		%		70-130	18-SEP-19
1,2-Dichloroethane			96.4		%		70-130	18-SEP-19
1,2-Dichloropropane			98.9		%		70-130	18-SEP-19
1,3-Dichlorobenzene			89.8		%		70-130	18-SEP-19
1,4-Dichlorobenzene			90.3		%		70-130	18-SEP-19
Acetone			97.7		%		60-140	18-SEP-19
Benzene			99.2		%		70-130	18-SEP-19
Bromodichloromethane			97.0		%		70-130	18-SEP-19
Bromoform			92.8		%		70-130	18-SEP-19
Bromomethane			87.4		%		60-140	18-SEP-19
Carbon tetrachloride			96.0		%		70-130	18-SEP-19
Chlorobenzene			94.1		%		70-130	18-SEP-19
Chloroform			97.1		%		70-130	18-SEP-19
cis-1,2-Dichloroethylene			94.1		%		70-130	18-SEP-19
cis-1,3-Dichloropropene			95.0		%		70-130	18-SEP-19
Dibromochloromethane			96.8		%		70-130	18-SEP-19
Dichlorodifluoromethane			99.6		%		50-140	18-SEP-19
Ethylbenzene			94.1		%		70-130	18-SEP-19
n-Hexane			88.2		%		70-130	18-SEP-19



### Quality Control Report

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>								
	<b>Water</b>							
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-1</b>	<b>LCS</b>							
m+p-Xylenes			93.5		%		70-130	18-SEP-19
Methyl Ethyl Ketone			91.6		%		60-140	18-SEP-19
Methyl Isobutyl Ketone			94.6		%		60-140	18-SEP-19
Methylene Chloride			95.1		%		70-130	18-SEP-19
MTBE			96.4		%		70-130	18-SEP-19
o-Xylene			94.5		%		70-130	18-SEP-19
Styrene			95.4		%		70-130	18-SEP-19
Tetrachloroethylene			91.7		%		70-130	18-SEP-19
Toluene			95.7		%		70-130	18-SEP-19
trans-1,2-Dichloroethylene			91.9		%		70-130	18-SEP-19
trans-1,3-Dichloropropene			94.4		%		70-130	18-SEP-19
Trichloroethylene			94.8		%		70-130	18-SEP-19
Trichlorofluoromethane			96.6		%		60-140	18-SEP-19
Vinyl chloride			105.5		%		60-140	18-SEP-19
<b>WG3163973-2</b>	<b>MB</b>							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	19-SEP-19
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	19-SEP-19
1,1,1-Trichloroethane			<0.50		ug/L		0.5	19-SEP-19
1,1,2-Trichloroethane			<0.50		ug/L		0.5	19-SEP-19
1,1-Dichloroethane			<0.50		ug/L		0.5	19-SEP-19
1,1-Dichloroethylene			<0.50		ug/L		0.5	19-SEP-19
1,2-Dibromoethane			<0.20		ug/L		0.2	19-SEP-19
1,2-Dichlorobenzene			<0.50		ug/L		0.5	19-SEP-19
1,2-Dichloroethane			<0.50		ug/L		0.5	19-SEP-19
1,2-Dichloropropane			<0.50		ug/L		0.5	19-SEP-19
1,3-Dichlorobenzene			<0.50		ug/L		0.5	19-SEP-19
1,4-Dichlorobenzene			<0.50		ug/L		0.5	19-SEP-19
Acetone			<30		ug/L		30	19-SEP-19
Benzene			<0.50		ug/L		0.5	19-SEP-19
Bromodichloromethane			<2.0		ug/L		2	19-SEP-19
Bromoform			<5.0		ug/L		5	19-SEP-19
Bromomethane			<0.50		ug/L		0.5	19-SEP-19
Carbon tetrachloride			<0.20		ug/L		0.2	19-SEP-19
Chlorobenzene			<0.50		ug/L		0.5	19-SEP-19



### Quality Control Report

Workorder: L2347004

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>		<b>Water</b>						
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-2 MB</b>								
Chloroform			<1.0		ug/L		1	19-SEP-19
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	19-SEP-19
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	19-SEP-19
Dibromochloromethane			<2.0		ug/L		2	19-SEP-19
Dichlorodifluoromethane			<2.0		ug/L		2	19-SEP-19
Ethylbenzene			<0.50		ug/L		0.5	19-SEP-19
n-Hexane			<0.50		ug/L		0.5	19-SEP-19
m+p-Xylenes			<0.40		ug/L		0.4	19-SEP-19
Methyl Ethyl Ketone			<20		ug/L		20	19-SEP-19
Methyl Isobutyl Ketone			<20		ug/L		20	19-SEP-19
Methylene Chloride			<5.0		ug/L		5	19-SEP-19
MTBE			<2.0		ug/L		2	19-SEP-19
o-Xylene			<0.30		ug/L		0.3	19-SEP-19
Styrene			<0.50		ug/L		0.5	19-SEP-19
Tetrachloroethylene			<0.50		ug/L		0.5	19-SEP-19
Toluene			<0.50		ug/L		0.5	19-SEP-19
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	19-SEP-19
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	19-SEP-19
Trichloroethylene			<0.50		ug/L		0.5	19-SEP-19
Trichlorofluoromethane			<5.0		ug/L		5	19-SEP-19
Vinyl chloride			<0.50		ug/L		0.5	19-SEP-19
Surrogate: 1,4-Difluorobenzene			99.9		%		70-130	19-SEP-19
Surrogate: 4-Bromofluorobenzene			99.5		%		70-130	19-SEP-19
<b>WG3163973-5 MS</b>		<b>WG3163973-3</b>						
1,1,1,2-Tetrachloroethane			94.4		%		50-140	19-SEP-19
1,1,1,2-Tetrachloroethane			94.4		%		50-140	19-SEP-19
1,1,1-Trichloroethane			93.4		%		50-140	19-SEP-19
1,1,2-Trichloroethane			96.3		%		50-140	19-SEP-19
1,1-Dichloroethane			96.2		%		50-140	19-SEP-19
1,1-Dichloroethylene			84.2		%		50-140	19-SEP-19
1,2-Dibromoethane			96.4		%		50-140	19-SEP-19
1,2-Dichlorobenzene			93.3		%		50-140	19-SEP-19
1,2-Dichloroethane			95.2		%		50-140	19-SEP-19
1,2-Dichloropropane			98.6		%		50-140	19-SEP-19



### Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

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Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

Contact: Pascal Renella

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
<b>VOC-511-HS-WT</b>	<b>Water</b>							
<b>Batch</b>	<b>R4821769</b>							
<b>WG3163973-5 MS</b>		<b>WG3163973-3</b>						
1,3-Dichlorobenzene			90.6		%		50-140	19-SEP-19
1,4-Dichlorobenzene			92.5		%		50-140	19-SEP-19
Acetone			90.2		%		50-140	19-SEP-19
Benzene			98.6		%		50-140	19-SEP-19
Bromodichloromethane			96.3		%		50-140	19-SEP-19
Bromoform			92.0		%		50-140	19-SEP-19
Bromomethane			86.7		%		50-140	19-SEP-19
Carbon tetrachloride			93.4		%		50-140	19-SEP-19
Chlorobenzene			94.2		%		50-140	19-SEP-19
Chloroform			96.0		%		50-140	19-SEP-19
cis-1,2-Dichloroethylene			94.1		%		50-140	19-SEP-19
cis-1,3-Dichloropropene			102.1		%		50-140	19-SEP-19
Dibromochloromethane			94.7		%		50-140	19-SEP-19
Dichlorodifluoromethane			80.7		%		50-140	19-SEP-19
Ethylbenzene			93.1		%		50-140	19-SEP-19
n-Hexane			83.5		%		50-140	19-SEP-19
m+p-Xylenes			92.3		%		50-140	19-SEP-19
Methyl Ethyl Ketone			89.7		%		50-140	19-SEP-19
Methyl Isobutyl Ketone			91.8		%		50-140	19-SEP-19
Methylene Chloride			93.8		%		50-140	19-SEP-19
MTBE			96.6		%		50-140	19-SEP-19
o-Xylene			93.1		%		50-140	19-SEP-19
Styrene			94.4		%		50-140	19-SEP-19
Tetrachloroethylene			92.0		%		50-140	19-SEP-19
Toluene			94.9		%		50-140	19-SEP-19
trans-1,2-Dichloroethylene			91.1		%		50-140	19-SEP-19
trans-1,3-Dichloropropene			101.9		%		50-140	19-SEP-19
Trichloroethylene			94.5		%		50-140	19-SEP-19
Trichlorofluoromethane			90.7		%		50-140	19-SEP-19
Vinyl chloride			97.5		%		50-140	19-SEP-19

# Quality Control Report

Workorder: L2347004

Report Date: 19-SEP-19

Client: GHD Limited (Waterloo)  
3061, rue Joseph-A Bombardier  
Laval QC H7P 6C5

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Contact: Pascal Renella

## Legend:

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Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

## Sample Parameter Qualifier Definitions:

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Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

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## Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

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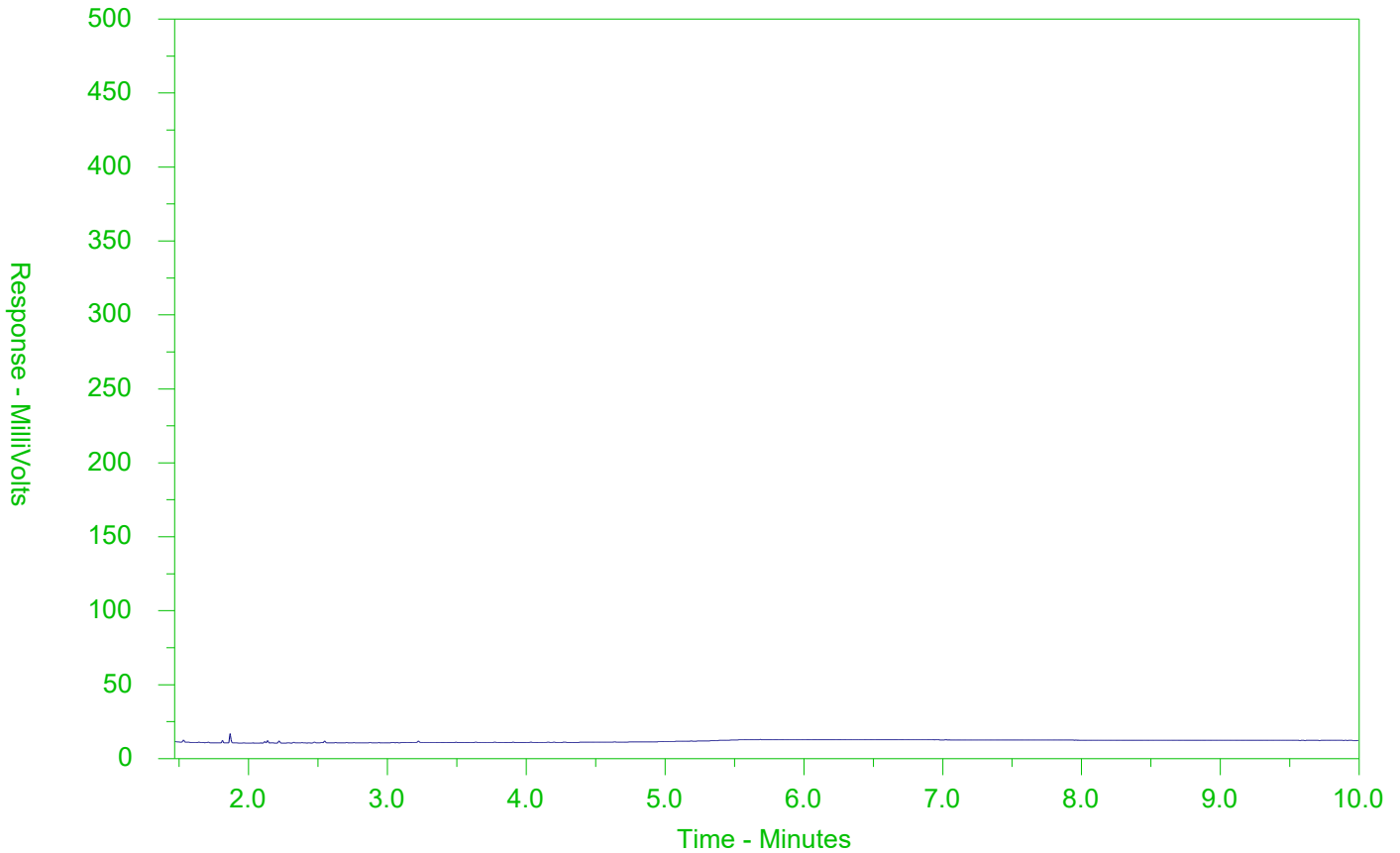
The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2347004-1  
 Client Sample ID: GW-11196246-091319-TB-MW5-19



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

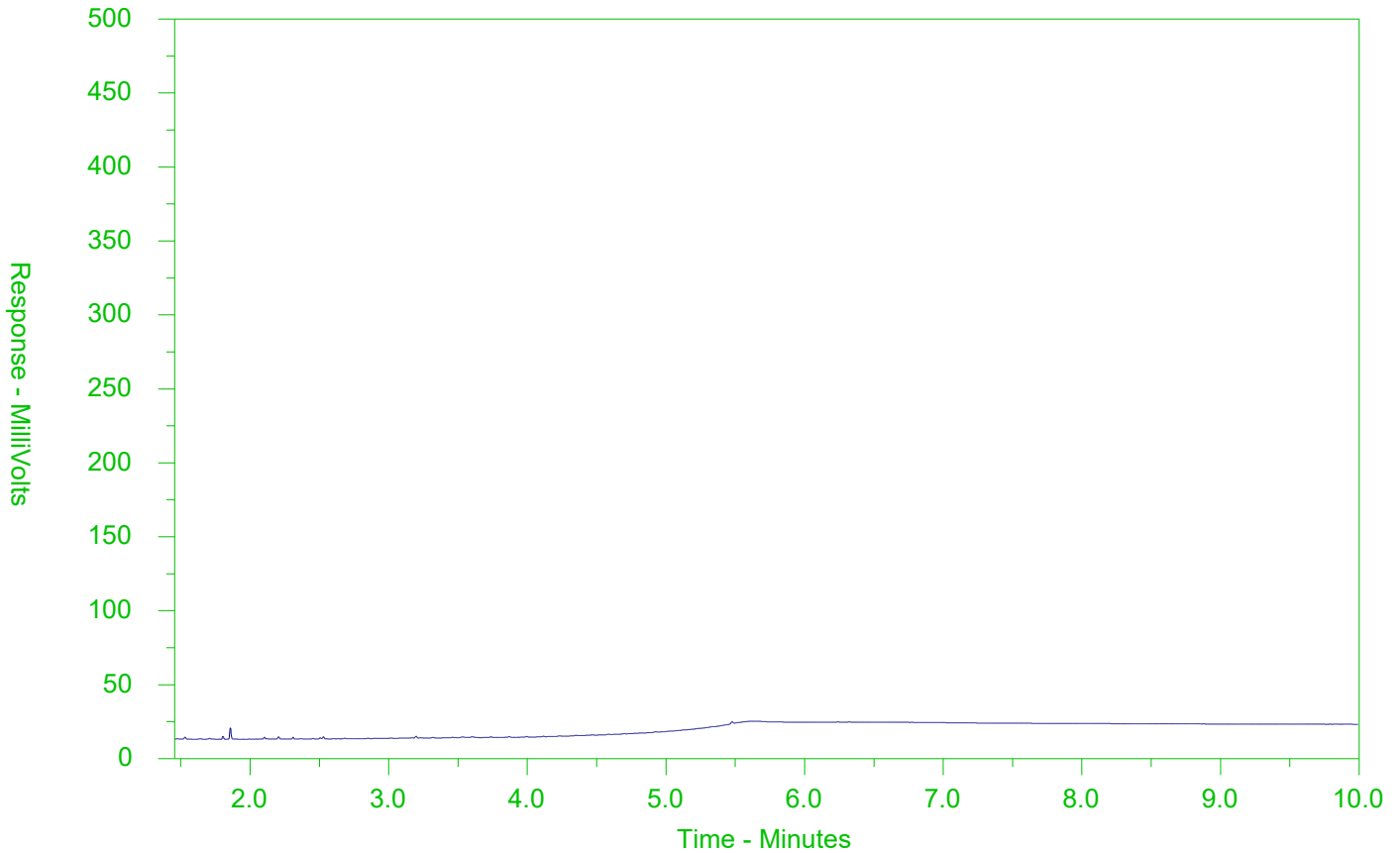
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2347004-2  
 Client Sample ID: GW-11196246-091319-TB-MWX



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

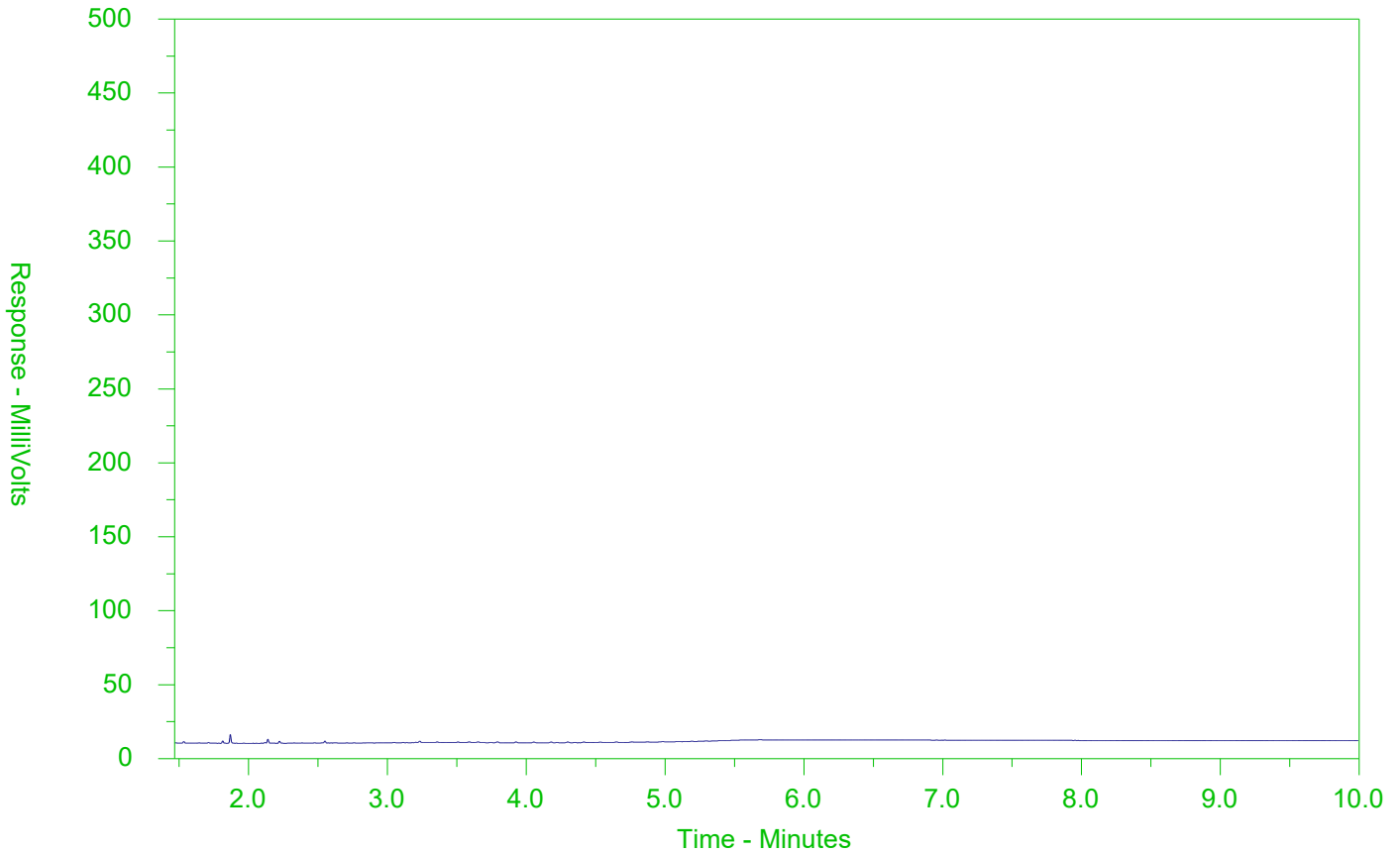
Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).

# CCME F2-F4 HYDROCARBON DISTRIBUTION REPORT



ALS Sample ID: L2347004-3  
 Client Sample ID: GW-11196246-091319-TB-MW6-19



← F2 →		← F3 →		← F4 →	
nC10	nC16		nC34		nC50
174°C	287°C		481°C		575°C
346°F	549°F		898°F		1067°F
← Gasoline →			← Motor Oils/Lube Oils/Grease →		
← Diesel/Jet Fuels →					

The CCME F2-F4 Hydrocarbon Distribution Report (HDR) is intended to assist you in characterizing hydrocarbon products that may be present in your sample.

The scale at the bottom of the chromatogram indicates the approximate retention times of common petroleum products and four n-alkane hydrocarbon marker compounds. Retention times may vary between samples, but general patterns and distributions will remain similar.

Peak heights in this report are a function of the sample concentration, the sample amount extracted, the sample dilution factor and the scale at the left.

Note: This chromatogram was produced using GC conditions that are specific to ALS Canada CCME F2-F4 method. Refer to the ALS Canada CCME F2-F4 Hydrocarbon Library for a collection of chromatograms from common reference samples (fuels, oils, etc.). The HDR Library can be found at [www.alsglobal.com](http://www.alsglobal.com).





Chain of Custody (COC) / Analytical Request Form



L2347004-COFC

COC Number: 17 -

Page 1 of 1

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

<b>Report To</b> Contact and company name below will appear on the final report		<b>Report Format / Distribution</b>			<b>Select Service Level Below - Contact your AM to confirm all E&amp;P TATs (surcharges may apply)</b>																															
Company: <b>GHD LIMITED - ACCT #13791</b>		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)			Regular [R] <input checked="" type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply																															
Contact: <b>Pascal Renella</b>		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			PRIORITY (Business Days) 4 day [P4-20%] <input type="checkbox"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/>		EMERGENCY 1 Business day [E - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200%] (Laboratory opening fees may apply) <input type="checkbox"/>																													
Phone: <b>450-973-4165</b>		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked																																		
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																		
Street: <b>455 Phillip St</b>		Email 1 or Fax <b>pascal.renella@ghd.com</b>			Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm																															
City/Province: <b>Waterloo, Ontario</b>		Email 2 <b>See PO</b>			For tests that can not be performed according to the service level selected, you will be contacted.																															
Postal Code: <b>N2L 3X2</b>		Email 3			<b>Analysis Request</b>																															
<b>Invoice To</b>		<b>Invoice Distribution</b>			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																															
Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX																																		
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 1 or Fax <b>apinvoiced-735@ghd.com</b>			<table border="1"> <tr> <td rowspan="2">NUMBER OF CONTAINERS</td> <td rowspan="2">O. Reg Metals (Met. Hg. Cr6)</td> <td rowspan="2">VOC,F,1-F4-511-P-WT</td> <td rowspan="2">PAH-511-WT</td> <td rowspan="2">VOC,F,1 (Trip Blank)</td> <td colspan="10"></td> </tr> <tr> <td colspan="10"></td> </tr> </table>							NUMBER OF CONTAINERS	O. Reg Metals (Met. Hg. Cr6)	VOC,F,1-F4-511-P-WT	PAH-511-WT	VOC,F,1 (Trip Blank)																				
NUMBER OF CONTAINERS	O. Reg Metals (Met. Hg. Cr6)	VOC,F,1-F4-511-P-WT	PAH-511-WT	VOC,F,1 (Trip Blank)																																
Company: <b>GHD Limited</b>		Email 2			<b>SAMPLES ON HOLD</b>																															
Contact: <b>SEE SSOW</b>																																				
<b>Project Information</b>		<b>Oil and Gas Required Fields (client use)</b>			<b>SUSPECTED HAZARD (see Special Instructions)</b>																															
ALS Account # / Quote #: <b>13791</b>		AFE/Cost Center: <b>PO#</b>																																		
Job #: <b>11196246</b>		Major/Minor Code: <b>Routing Code:</b>																																		
PO / AFE:		Requisitioner:																																		
LSD:		Location:																																		
ALS Lab Work Order # (lab use only): <b>L2347004</b>		ALS Contact: <b>Rick H</b> Sampler: <b>T Brindle</b>																																		
<b>ALS Sample # (lab use only)</b>		<b>Sample Identification and/or Coordinates (This description will appear on the report)</b>			<b>Date (dd-mmm-yy)</b>		<b>Time (hh:mm)</b>		<b>Sample Type</b>																											
		GW-11196246-091319 TB MW5-19			13-Sep-19		11:40		Water																											
		GW-11196246-091319 TB MWX			↓		11:40		Water																											
		GW-11196246-091319 TB MW6-19			↓		13:25		Water																											
		Trip Blank			13-Sep-19		12:00		Water																											
<b>Drinking Water (DW) Samples<sup>1</sup> (client use)</b>		<b>Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)</b>			<b>SAMPLE CONDITION AS RECEIVED (lab use only)</b>																															
Are samples taken from a Regulated DW System? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Tabke 2 - ICC			Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>																															
Are samples for human consumption/ use? <input type="checkbox"/> YES <input type="checkbox"/> NO					Ice Packs <input checked="" type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>																															
					Cooling Initiated <input type="checkbox"/>																															
					INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C																												
								9.6																												
<b>SHIPMENT RELEASE (client use)</b>		<b>INITIAL SHIPMENT RECEPTION (lab use only)</b>			<b>FINAL SHIPMENT RECEPTION (lab use only)</b>																															
Released by: <b>[Signature]</b> Date: <b>09/13/19</b> Time: <b>14:17</b>		Received by: _____ Date: _____ Time: _____			Received by: <b>[Signature]</b> Date: <b>Sep 13/19</b> Time: <b>14:17</b>																															

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

JUNE 2016 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

# Appendix E

## Analytical Data Verification Memorandum



# Memorandum

October 23, 2019

To: Natalie Smith Ref. No.: 11196246-01

From:  Pascal Renella/vl/1

Subject: Data Quality Assessment and Verification

Laboratory: ALS Canada Ltd.

Date(s) Sampled: June 27-28, July 2-3-8-11-15 and September 13, 2019

Lab Job No.: L2305757, L2308539, L2310028, L2347004, L2303880

Media Sampled: Groundwater and Soil

QA/QC	Criteria	Pass	Qualifiers	Fail	N/A
Holding Times	Analyte specific	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field Duplicate (blind)	Within 50% of original/<1xRL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field Blank (blind)	Non-detect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Trip Blank	Non-detect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Temperature/Peservation	<10°C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lab QA/QC	Within standard recoveries	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Data OK for Use		Yes <input type="checkbox"/>	With Qualifiers <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Initial: PR

The following result is qualified due to filtration and preservation at the laboratory:

Lab Report #	Sample ID	Analyte	Result	Qualifier	Units
L2310028	GW-11196246-071519-SO-MW4-19	Mercury (dissolved)	0.025	J	µg/L

Notes:

J - Estimated Concentration



## about GHD

GHD is one of the world's leading professional services companies operating in the global markets of water, energy and resources, environment, property and buildings, and transportation. We provide engineering, environmental, and construction services to private and public sector clients.

**Natalie Smith**

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519.340.3831

**Greg Brooks**

Gregory.Brooks@ghd.com  
519.340.4235

[www.ghd.com](http://www.ghd.com)