



2020 Annual Surface Water Quality Monitoring Report

Clean Harbors Lambton Facility

Clean Harbors Canada Inc.

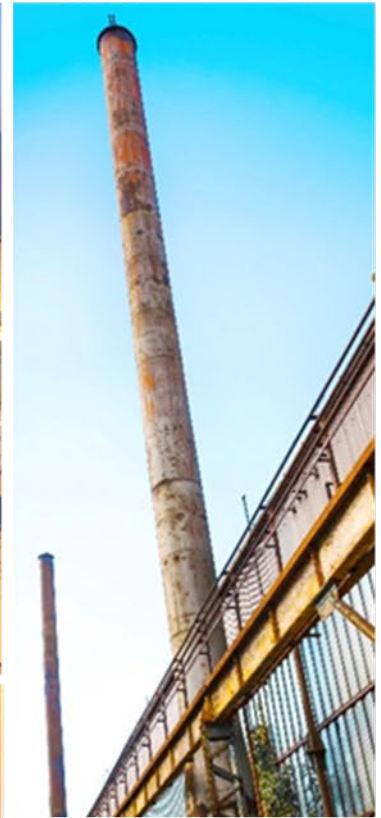




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1. Introduction

1.1 Purpose and Organization

GHD on behalf of Clean Harbors Canada, Inc. (Clean Harbors) has prepared the “2020 Annual Surface Water Quality Monitoring Report” for the Clean Harbors Lambton Facility (Lambton Facility or Site) located at 4090 Telfer Road, St. Clair Township, Ontario.

The Lambton Facility is a hazardous waste disposal facility owned and operated by Clean Harbors. The main hazardous waste disposal operations at the facility are the disposal of liquid waste in a liquid incinerator and the processing and disposal of solid waste in the landfill. The hazardous solid waste landfill component located at the Site operates in accordance with Environmental Compliance Approval No. A031806 (Waste ECA) issued by the Ministry of the Environment, Conservation and Parks (MECP).

In October of 2018, Clean Harbors applied for an amendment to the surface water management system to alter the on-site surface water ditches and ponds. Environmental Compliance Approval No. 4731-BNNT5Y dated April 20, 2020 (SW ECA) is a new ECA for the surface water management system. The SW ECA replaces ECA No. 1065-9VVJSW dated October 19, 2015 and ECA No. 2985-B9KKP2 dated September 9, 2019. Both the Waste ECA and SW ECA have conditions that relate to surface water monitoring requirements. Copies of the Waste ECA and SW ECA are provided in the 2020 Clean Harbors Lambton Facility Annual Landfill Monitoring Report (Landfill Annual Monitoring Report).

Condition 9(a)(i) of the Waste ECA requires that by December 15, 2015 Clean Harbors submit an updated surface water monitoring program to the Regional Director for approval, while Condition 8 of the former ECA No. 1065-9VVJSW required that within 6 months of issuance that Clean Harbors prepare and submit to the Director for approval a proposal for the characterization of storm water from the facility. Clean Harbors responded to both of the above conditions with the submission of a letter prepared by GHD titled “Surface Water Monitoring Program and Surface Water Characterization Program, Lambton Facility, Corunna, Ontario” dated December 9, 2015. A copy of this letter is provided in Appendix A. SW ECA includes the characterization program approved by the MECP Regional Director on March 29, 2016.

The SW ECA required the following item to be developed and submitted to MECP by April 20, 2021:

- Condition 4 (1) – Prepare and submit a Contingency and Remedial Action Plan for the stormwater works

The current approved surface water monitoring and storm water characterization programs are summarized in Section 3.

1.2 Site Location

The Lambton Facility is a hazardous waste management complex on 121 hectares (ha) of land located within Lots 8 and 9, Concession 10 in St. Clair Township, Lambton County, operated by Clean Harbors. The facility location and site plan are presented on Figures 1 and 2. Geo-reference data for the Lambton Facility is presented in Table 1.



Table 1 Geo-Reference Data for the Lambton Facility

Location ⁽¹⁾	Northing	Easting
Northeast Corner of the Facility	4748849	394521
Southeast Corner of the Facility	4747490	394478
Northwest Corner of the Facility	4748882	393626
Southwest Corner of the Facility	4747582	393570

The Lambton Facility includes an analytical laboratory, transportation depot, high temperature incinerator, solid waste pre-treatment processes, and a secure landfill (waste disposal site). The solid waste pre-treatment processes at the facility include acid/alkali pre-treatment system (AAPS), thermal desorber unit (TDU), land disposal restriction building (LDR), spent pot liner treatment (SPL), and organic debris treatment.

1.3 Ownership and Key Personnel

The Lambton Facility is owned and operated by Clean Harbors. Any environmental issues at the Site are addressed by the following personnel:

Ms. Erica Carabott, Senior Compliance Manager
Clean Harbors Canada, Inc.
4090 Telfer Road, Rural Route #1
Corunna, Ontario N0N 1G0
Phone: (519) 864-3890, E-mail: carabott.eric@cleanharbors.com

GHD was retained by Clean Harbors to conduct the 2020 annual monitoring program. The Competent Environmental Practitioner (CEP) who reviewed the 2020 Annual Surface Water Quality Monitoring Report is:

Mr. Jim Yardley, P.Eng.
GHD
455 Phillip Street
Waterloo, Ontario N2L 3X2
Phone: (519) 884-0510, E-mail: Jim.Yardley@GHD.com

1.4 Waste Disposal Site

The secure landfill occupies a total fill area of approximately 56 ha that includes the pre-1986 fill area, Cell 16 completed in 1992, Cell 17 completed in early 1998, and Cell 18 completed in early 2016. The 2020 operational area (disposal area for landfilling at the Lambton Facility) was in Cell 19-2 and Cell 19-3. The landfill disposal method and sequence is provided in the Design and Operations Report - Lambton Landfill Expansion (D&O Report) prepared by Tetra Tech WEI Inc. and dated October 8, 2015 and the most recent Waste ECA amendment. During the 2020 reporting period:

1. Cell 19-3 was constructed and the perimeter leachate collection trench was extended in the south-east portion of the disposal area
2. Disposal occurred in Cell 19-2 and Cell 19-3



3. Interim cover was installed over the majority of Cell 19-2, with the exception of the active landfilling area (Cell 19-2D, Cell 19-2G, and Cell 19-3A)
4. Final cover on Cell 19-1 was completed and vegetated
5. The waste transport route to Cell 19-3 was adjusted and extended

The 2015 vertical expansion of the Lambton Facility landfill means that the landfilled area will transition from a relatively flat/shallow grade final contour (less than 5 percent grade) to a more traditional landfill shape (25 percent side slope and 5 percent top slope grades). The amended surface water management system is presented in the October 3, 2018 report Surface Water Management Amendment prepared by GHD. The surface water management system was approved by the SW ECA and was designed to accommodate surface water for the approved final contours.

The portion of the landfill area not directly used for landfilling contains drainage ditches, surface water ponds, access roads, and stockpiles of clay and topsoil. In the central portion of the landfill area, the Site is used for several waste processing components such as the TDU, SPL, container storage, and leachate storage (covered ponds). Undeveloped buffer land and berms separate the landfill operation from surrounding properties. The perimeter ditches and surface water ponds side slopes are routinely inspected for stability and signs of erosion. Major site features that relate to the surface water management system at the Site are shown on Figure 2. The construction of the revised surface water management system commenced in 2020 and was completed by October 30, 2020. The revised surface water management system is shown on Figure 3. The SW ECA addresses the amendments and the transition period required to address the various items.

Additional information with regard to waste volumes received, landfill cell development, landfill operation and management, engineering controls, leachate management and incineration, and all other relevant waste disposal site developments during the current reporting period are presented within the 2020 Landfill Annual Monitoring Report.

1.5 Water Management System

The following presents a description of the Lambton Facility's water management system that includes surface water and process water. Leachate, i.e., surface water generated from the active waste disposal area, is discussed in the Landfill Annual Monitoring Report.

1.5.1 Surface Water Management

Surface water is generated from non-operational areas at the Lambton Facility. Non-impacted surface water runoff from undeveloped portions of the Site, perimeter berms, and capped and closed landfill cells, and waste disposal cells with interim cover is directed through a series of on-Site drainage ditches and ponds. The previous surface water management system (prior to early 2020) consisted of two on-Site surface water storage ponds (West Pond and East Pond). In 2020, the revised surface water management system was developed and during the transition period, pumps were used to manage the surface water in the construction area and to bypass the construction area. The surface water management system consists of four ponds identified as Pond A, B, C, and D. The four ponds are located in the southern portion of the Site and incorporated portions of the former East and West Ponds. The ponds are linked and operate as one large pond from a surface water point of view. The perimeter surface water ditches discharge to the ponds.



The Lambton Facility's Surface Water Treatment Plant (SWTP) for processing surface water pumped from the West Pond is rated with a treatment capacity of 4,500 cubic metres per day (m³/day). The SWTP consists of the following:

- Two influent pumps (including one standby), each with rated capacity of 22.7 litres per second (L/s) at 310 kilopascals (kPa) (300 imperial gallons per minute [IGPM] at 45 pounds per square inch gauge [psig]).
- Two sand filters, each with 3.6 m outside diameter and 1.8 m high, containing 6.4 m³ of 0.3 mm of silica sand and 3.2 m³ of 1.0 mm anthracite, equipped with backwash pump rated at 49.3 L/s at 138 kPa (650 IGPM at 20 psig).
- One activated carbon filter consisting of a concrete above-ground basin with overall dimension of 2.4 m high, 4.3 m long, and 1.8 m wide containing 1.2 m³ of 20 mm clear crushed stone and 14.2 m³ of granular activated carbon.

The SWTP is operated when the live surface water storage across the Site needs to be increased, often driven by precipitation events and seasonal wet periods of high runoff. Each time upon startup the SWTP operates in recirculation mode until the effluent criteria established under Condition 5 of the SW ECA are met. If an exceedance of the effluent criteria is identified, the SWTP remains in recirculation mode until test results are in compliance with daily effluent criteria. Likewise, if during operating modem, daily effluent criteria are exceeded, the SWTP is switched to recirculation mode.

Once the effluent from the SWTP is in compliance with the SW ECA criteria, the treated water is discharged to the Equalization Pond. The effluent is subsequently discharged via a gated channel to the municipal drainage ditch located along the eastern side of Telfer Road.

The SWTP is maintained by Clean Harbors staff through backwashing of the filter systems, and occasionally through replacement of the filter media.

1.5.2 Process Water Management

Surface water runoff from the operational areas is considered to be process water and is directed to one of the two process water ponds (North Process Water Pond, South Process Water Pond) either by ditches or through pumps, forcemains, or vacuum trucks. A new process water pond, West Process Water Pond, was constructed in 2016 and receives water from the South Process Water Pond through a forcemain and overland hosing. The three process water ponds store the process water on-Site until the process water is used for facility operations including quench water in the on-Site incinerator. The incinerator requires up to 11 million L of quench water per month and 8 million L of process water for the spray dryer. During a dry period and when process water is low, surface water from Pond D is transferred to the process water ponds for use as quench water. This normally occurs during the dryer periods of the year (August through October).

1.5.3 SWTP Maintenance

Maintenance of the SWTP is conducted as required to maintain treatment flow and water quality. The timing of the maintenance depends on the amount of water treated and the performance of the SWTP. During the 2020 monitoring period, the following maintenance was conducted on the SWTP:

- Treated effluent was recirculated at the SWMP on January 13, 2020



- The valve on the pump was boosted on January 15, 2020 and on February 6, 2020
- The suction line was inspected and repositioned on February 24, 2020
- The sand filters were backwashed on April 20, 2020
- The suction line to the pump was replaced on April 27, 2020

1.6 Limitations

GHD was retained by Clean Harbors to review, summarize, and report the data provided by Clean Harbors as it relates to the assessment of surface water conditions. Clean Harbors holds the responsibility for field instrument calibration, precision and accuracy, quality assurance/quality control of the collected data, and provision of documented field observations/inspections. GHD has assumed that the data collected and provided by Clean Harbors is valid and reliable for the purposes of producing this monitoring report.

2. Physical Setting

The Lambton Facility is a rectangular shaped piece of land situated on a 121.4 ha parcel. The Lambton Facility is bordered on all sides by rural residential and agricultural land. The Site location is provided on Figure 1.

2.1 Geology and Hydrogeology

The Lambton Facility lies within the Lambton Clay Plain which is a sub-region of the St. Clair Clay Plain physiographic region. The surficial geology is characterized by thick clay sediments and the area's topography is flat to slightly undulating. The combination of relatively flat topography and the fine texture clay soil result in an area that has poor drainage. Alluvial sediments and organic deposits can be found in the local stream, stream valleys, and wetlands.

Detailed information on the geological and/or hydrogeological conditions at the Lambton Facility during the current monitoring period is presented in the 2020 Annual Groundwater Monitoring Report, prepared by GHD.

2.2 Surface Water Features

The Lambton Facility resides within the Sydenham River basin watershed, which ultimately drain into Lake St. Clair. The main watercourse found in the Sydenham River watershed is Bear Creek. Bear Creeks is approximately 70 kilometres (km) in length and is fed by numerous tributaries including those found in the vicinity of the Lambton Facility and the downstream catchment area.

Seasonally intermittent flow conditions occur within the eastern Telfer roadside ditch immediately downstream of the Lambton Facility's Equalization Pond discharge occur and flow is normally related to a precipitation event or discharge from the Equalization Pond. Local drainage patterns downstream are heavily influenced by the nearby agricultural farms, in that the extensive tile drainage and ditch systems have been constructed to deal with irrigation and rainfall in soils that have low infiltration.



3. Monitoring Program

3.1 Surface Water Monitoring

The surface water monitoring program is documented in the SW ECA and is consistent with the letter prepared by GHD titled “Surface Water Monitoring Program and Surface Water Characterization Program, Lambton Facility, Corunna, Ontario” dated December 9, 2015. The surface water monitoring program generally did not change with the amendment to the stormwater management system (dated September 9, 2019).

Surface water is stored within the ponds at the Site and treated surface water is mainly discharged during the spring/summer periods. As such, the surface water discharge quality is not influenced by a specific precipitation event, but provides a normal or consistent quality for a period of time and year over year.

The surface water monitoring program for the Site is summarized in Tables 2 and 3. The monitoring consists of daily discharge monitoring, monthly discharge monitoring conducted during discharge periods at on-site locations, and seasonal monitoring at off-site locations. The following sections provide information with regard to the surface water monitoring program. Surface water effluent discharge limits are presented in Table 4 below.

Table 4 Effluent Discharge Limits

Effluent Parameter	Concentration Limit (mg/L)
Total Suspended Solids (TSS)	15.0
Solvent Extractables	15.0
Phenols	0.02
pH of the effluent maintained between 5.5 to 9.5, inclusive, at all times	

3.1.1 Daily Discharge Monitoring

Location: Equalization Pond discharge

Frequency: Daily when the Equalization Pond is discharging to the off-Site drainage ditch

Parameters: pH, specific conductivity, total suspended solids (TSS), phenols, and solvent extractables (oil & grease)

Rationale: The parameters represent routine parameters that are representative of general surface water quality during the discharge period and indicate the overall performance of the treatment plant. Four parameters have established Site-specific discharge criteria – pH, TSS, phenols, solvent extractables.

3.1.2 Monthly Discharge Monitoring

The monthly discharge monitoring program consists of three components: chemical parameter monitoring, toxicity monitoring, and visual monitoring.



3.1.2.1 Monthly Discharge Chemical Monitoring

Location:	Equalization Pond discharge, West Pond (or Pond D), East Pond (or Pond A)
Frequency:	a) At start of discharge, within 25 to 35 days after discharge commencement, and within 25 to 35 days after the previous sample collection when discharge occurring. b) If discharge ceases for less than 30 days and discharge recommences, the initial monitoring schedule shall continue. If discharge ceases for greater than 30 days, monitoring shall revert as per item a).
Parameters:	General Chemistry, total metals, volatile organic compounds (VOC), and semi-volatile organic compounds (sVOC) as specified in Table 3.
Rationale:	Provides a detailed chemical profile of the water prior to and during discharge periods for both pre- and post-treatment of the water. Parameters represent chemical constituents that are accepted at the Lambton Facility and as such may be present in the surface water system.

3.1.2.2 Toxicity Monitoring

Location:	Equalization Pond discharge
Frequency:	As per the monthly discharge chemical monitoring program.
Parameters:	Microtox for fresh water in accordance with Environment Canada test method and protocols.
Rationale:	Monitors the overall water quality toxicity with an approved program.

3.1.2.3 Visual Observations

Location:	Equalization Pond
Frequency:	As per the monthly discharge chemical monitoring program.
Parameters:	Presence/absence of fish in the Equalization Pond through observation with food application at several locations around the Equalization Pond perimeter.
Rationale:	Monitors whether fish are present in the pond and a general understanding of the overall health of the Equalization Pond and water quality with regard to aquatic life.

3.1.3 Off-Site Surface Water Monitoring

Location:	STN6 (upstream of discharge) and STN6A (downstream of discharge). See Figure 1 for monitoring locations.
Frequency:	Two samples per year, one in the spring and one in the late summer/fall period. Samples to be collected when a discharge is occurring and on the same day as



the monthly discharge samples are collected. The time period between the spring and late summer/fall sample should be a minimum of 80 days.

Parameters: General Chemistry, total metals, VOC, and sVOC as specified in Table 3. Analytical testing to be conducted by external Canadian certified laboratory.

Rationale: Provides a detailed chemical profile of the water in a downstream drainage system prior to and after the discharge of water from the drainage ditch that serves the facility. Parameters are consistent with the discharge monitoring parameters.

3.2 Surface Water Characterization

The surface water characterization program noted in Condition 8 of the SW ECA relates to concerns expressed during the vertical expansion approval and the potential changes that may occur with the surface water management system due to changes in the landfill operations and methods. A key concern is the potential for dust/operational impacts since the initial disposal cell (Cell 19) is in close proximity to the West Pond (or Pond C and D), which is the main surface water storage pond prior to water treatment, and this cell will be filled in the first 5 years of the landfill expansion program.

Review of historic data associated with the Lambton Facility with regard to surface water and process water quality have indicated that metals are the dominate set of parameters that change as a result of operational changes or changes in disposal location. The VOC and sVOC parameters also indicate some differences, but these are sporadic and low level (below criteria).

The surface water characterization program monitoring has been incorporated within the surface water monitoring program by monitoring the East Pond (or Pond A) and West Pond (or Pond D) prior to and during discharge periods for general chemistry, metals, VOCs, and sVOCs. These represent periods when water is present within the ponds, or a period of long-term water storage. The monitoring for a period of 5 years after commencement of the landfill expansion will allow a database to be established that will provide a long-term database for the new surface water management set-up. Amendments to the surface water characterization program that is part of the surface water monitoring program will be handled through the annual monitoring program and any modifications would require the approval of the Regional Director.

3.3 Amendments to Surface Water Monitoring Program

Once a 5-year database of surface water monitoring post-commencement of the landfill expansion has been collected, Clean Harbors may assess the data and recommend changes to the surface water monitoring program. The assessment will be conducted as part of the Annual Surface Water Quality Monitoring Report and specific amendments to the surface water program will be provided in the report recommendations section. Changes to the surface water monitoring program will require review by MECP Regional staff and approval of the recommendations by the Regional Director. The first year of the amended monitoring program is 2016. The review was to be conducted after 5 years of data was collected. In 2020, characterization samples were limited due to construction activities. As such, it is proposed to delay the review for one year. This will allow the 2021 monitoring to be incorporated into the review that will address the amendment to the surface water ponds and the installation of final cover on Cell 19-1. The review will be included in the 2021 Annual Surface Water Quality Monitoring Report.



Clean Harbors may collect additional surface water samples that relate to specific events or to collect additional information with regard to the management and operation of the surface water system. These additional events/samples will only become part of the official monitoring program if recommended by Clean Harbors in the Annual Surface Water Quality Monitoring Report and approved by the Regional Director.

3.4 Provincial Officer's Order No. 2681-BCPKUJ

Provincial Officer's Order No. 2681-BCPKUJ (Order) was issued on June 5, 2019. A copy of the Order and related correspondence is provided in Appendix B. The Order relates to a report of a seep from the perimeter leachate collection system (LCS) into the south perimeter ditch. Upon identification of the seep, the immediate seep area was isolated and additional temporary dams were installed within the south ditch at the east and west ends, and at the entrance to the West Pond. The initial work was conducted in accordance with Provincial Officer's Order No. 8210-BBCPS2 which was replaced with Provincial Officer's Order No. 2681-BCPKUJ. Subsequent to the initial work, Clean Harbors continued to commence water control activities to minimize the capture area of the impacted area, installation of temporary piping works to transfer surface water around the zone of concern, to install temporary water treatment, and assess the conduct maintenance on the surface water treatment plant. As well, the Clean Harbors South Ditch, Water and Leachate Management Plan was developed that outlined the remediation work and water control required to address the seep and the impacted area.

From a surface water quality perspective, additional water quality monitoring was implemented to confirm that water entering from the potential seep area was not impacted with leachate, and any treated water from the impacted area was confirmed to be non-impacted prior to discharge to the surface water management ponds. This information was presented weekly to MECP as per the Order and is not included in this report. The additional testing confirmed that the surface water released from the site did not indicate an impact from leachate or the remediation efforts at the Site.

The requirement to provide weekly reports to the MECP was removed from the order by MECP once the LCS returned to normal operating conditions in early May 2020 and the frac tanks were emptied and removed from Site in July 2020.

4. Monitoring Results and Assessment

4.1 Daily Discharge Monitoring

The results of the daily discharge monitoring for the Equalization Pond is presented in Table 5. As shown in Table 5, effluent was discharged during the following periods:

- Period 1: January 13, 2020 to February 28, 2020
- Period 2: April 13, 2020 to May 4, 2020
- Period 3: May 29, 2020 to June 2, 2020



Data for all parameters regularly analyzed is available for Periods 1 to 3. There were no exceedances of the 15 mg/L limit for TSS specified in the SW ECA in 2020. The SWMP was put in recirculation mode on January 13, 2020 with discharge commencing on January 14, 2020.

Effluent discharge presented in Table 5 during the noted periods were below the maximum discharge rate for the SWTP of 4.5 million litres per day (L/d) specified in the SW ECA.

4.2 Monthly Discharge Monitoring

The results of the monthly discharge monitoring are presented in Tables 6 to 9 with analytical reports provided in Appendix C. An analytical data verification memo summarizing GHD's assessment of the samples, supporting quality assurance/quality control (QA/QC) procedures is included in Appendix D. Where applicable, the data summarized in the tables have been qualified accordingly.

4.2.1 Monthly Discharge Chemical Monitoring

Monthly monitoring samples for the Equalization Pond for general chemistry, metals, and sVOCs were taken on January 13, 2020, February 17, 2020, April 13, 2020, and June 1, 2020. Samples were taken at intervals in compliance with the SW ECA. Only metals analysis was completed on the sample collected on June 1, 2020.

The results of the monthly discharge chemical monitoring are presented in Table 6.

As compared to the Provincial Water Quality Objectives (PWQO), the analytical results were generally below the PWQO, with the exception of the following:

- Total phenolics above the objective of 0.001 mg/L on January 13 (0.0022 mg/L), February 17 (0.0118J mg/L), and April 13 (0.0021 mg/L)
- Phosphorus above the objective of 0.01 mg/L on January 13 (0.0266 mg/L), February 17 (0.0328J mg/L), and April 13 (0.0311 mg/L)
- Aluminum above the objective of 0.075 mg/L on January 13 (0.161 mg/L), February 17 (0.406 mg/L), April 13 (0.154 mg/L), and June 1 (0.24 mg/L)
- Iron above the objective of 0.3 mg/L on February 17 (0.415 mg/L) and June 1 (0.332 mg/L)
- Molybdenum above the objective of 0.04 mg/L on January 13 (0.0647 mg/L), February 17 (0.0731 mg/L), April 13 (0.0659 mg/L), and June 1 (0.0677 mg/L)

The qualifier of 'J-' following a result in Table 6 indicates an estimated value where the result may be biased low. The rationale for the qualification of a result is provided in the associated QA/QC memorandum provided in Appendix D.

It was noted that a number of sVOC parameters had reporting limits that were above their associated PWQO, with bis(2-Ethylhexyl)phthalate (DEHP) the highest with a reporting limit of 2.5 µg/L and PWQO of 0.6 µg/L.



4.2.2 Toxicity Monitoring

Toxicity monitoring samples from the Equalization Pond were taken on January 13, 2020, February 17, 2020, April 13, 2020, and June 1, 2020.

The results of the toxicity monitoring are presented in Table 7.

All samples analyzed were within the specified limits to characterize the samples as being non-toxic in accordance with the SW ECA.

4.2.3 Visual Observation

Quarterly visual Site inspections were undertaken by GHD on March 16, June 5, September 16, and November 23, 2020 including of the surface water management system.

The presence of live fish in the Equalization Pond was confirmed during the second and third quarterly inspection. No fish were observed in the equalization pond at the time of the first and fourth quarterly inspections. The water is often murky at the time of the quarterly inspections, making it difficult to observe fish if they are in the deeper water. It is also likely that the fish were near the bottom of the pond given the colder temperatures at the time of inspection.

Water levels in the Equalization Pond were noted to be moderate during the first inspection and low during the fourth inspection. The status of the water levels during the second and third quarterly inspections was not noted.

A summary of the quarterly Site inspections are included in the Landfill Annual Monitoring Report.

4.2.4 Surface Water Characterization

Supplementary monitoring of the East and West Ponds for general chemistry, metals, VOCs, and sVOCs was undertaken on January 13, February 17, and April 13, 2020. The East Pond was also sampled on June 1, 2020. The West Pond was not sampled on June 1, 2020 since the pond had been dewatered for construction of the new surface water pond. Note, the sampling of the East and West Ponds will eventually be replaced by sampling Ponds A and D, respectively, under the revised stormwater management system. The results of the chemical monitoring for the East and West Ponds are presented in Tables 8 and 9, respectively.

As compared to the PWQO, the analytical results for the East Pond were generally below the PWQO with exception of the following:

- Total phenolics above the objective of 0.001 mg/L on January 13 (0.0046 mg/L), February 17 (0.0053J mg/L), and April 13 (0.0024 mg/L)
- Phosphorus above the objective of 0.01 mg/L on January 13 (0.189 mg/L), February 17 (0.0344J mg/L), and April 13 (0.0327 mg/L)
- Aluminum above the objective of 0.075 mg/L on January 13 (5.52 mg/L), February 17 (0.433 mg/L), April 13 (0.28 mg/L), and June 1 (1.11 mg/L)
- Cobalt above the objective of 0.0009 mg/L on January 13 (0.00457 mg/L) and June 1 (0.00178 mg/L)
- Copper above the objective of 0.005 mg/L on January 13 (0.0101 mg/L)



- Iron above the objective of 0.3 mg/L on January 13 (8.1 mg/L), February 17 (0.482 mg/L), April 13 (0.316 mg/L), and June 1 (1.79 mg/L)
- Lead above the objective of 0.005 mg/L on January 13 (0.00926 mg/L)
- Molybdenum above the objective of 0.04 mg/L on January 13 (0.0628 mg/L), February 17 (0.0744 mg/L), April 13 (0.0605 mg/L), and June 1 (0.0743 mg/L)
- Thallium above the objective of 0.0003 mg/L on January 13 (0.000325 mg/L)
- Vanadium above the objective of 0.006 mg/L on January 13 (0.0124 mg/L)
- Zinc above the objective of 0.03 mg/L on January 13 (0.0457 mg/L)

As compared to the PWQO, the analytical results for the West Pond were generally below the PWQO with exception of the following:

- Chromium VI (hexavalent) above the objective of 0.001 mg/L on January 13 (0.00129 mg/L)
- Total phenolics above the objective of 0.001 mg/L on January 13 (0.0031 mg/L), February 17 (0.0087J mg/L), and April 13 (0.0022 mg/L)
- Phosphorus above the objective of 0.01 mg/L on January 13 (0.0522 mg/L), February 17 (0.0323J mg/L), and April 13 (0.0531 mg/L)
- Aluminum above the objective of 0.075 mg/L on January 13 (1.08 mg/L), February 17 (0.461 mg/L), and April 13 (1.36 mg/L)
- Cobalt above the objective of 0.0009 mg/L on January 13 (0.00113 mg/L) and April 13 (0.00121 mg/L)
- Copper above the objective of 0.005 mg/L on April 13 (0.0346 mg/L)
- Iron above the objective of 0.3 mg/L on January 13 (1.26 mg/L), February 17 (0.395 mg/L), and April 13 (1.6 mg/L)
- Molybdenum above the objective of 0.04 mg/L on January 13 (0.063 mg/L), February 17 (0.073 mg/L), and April 13 (0.0688 mg/L)

The qualifier of 'J-' following a result in Tables 8 and 9 indicates an estimated value where the result may be biased low. The rationale for the qualification of a result is provided in the associated QA/QC memorandum provided in Appendix D.

It was noted that a number of sVOC parameters had reporting limits that were above their associated PWQO, with bis(2-Ethylhexyl)phthalate (DEHP) the highest with a reporting limit of 2.5 µg/L and PWQO of 0.6 µg/L.

A comparison of the chemical monitoring for the East and West Ponds to the Equalization Pond indicates the following:

- The analytical results for total phenolics and phosphorus at all three sampling locations is on approximately the same order of magnitude with no discernable trend noted between the concentrations at the three sampling locations.
- Individual concentrations of metals, including aluminum, iron, and silicon, were generally higher in the East Pond, with concentrations decreasing in the West Pond and Equalization Pond.



- The West Pond had a single reported result for chromium VI (hexavalent) above the PWQO during the reporting period.
- The East Pond had a single reported result for copper, lead, thallium, vanadium, and zinc above the respective PWQO during the January 13, 2020 monitoring event.
- Generally, surface water quality is the same or slightly improves as the water moves from the East Pond to the West Pond and through the SWTP and the Equalization Pond.

4.3 Off-Site Surface Water Monitoring

The background (STN6) and downstream (STN6A) off-Site monitoring locations are typically monitored as part of the monitoring program if water is discharged from the Equalization Pond for an extended period of time. Samples are to be collected in spring and late summer/fall during discharge, with samples analyzed for general chemistry, metals, VOCs, semi-VOCs. No samples were collected from STN6 and/or STN6A during the reporting period. The spring discharge period was shorter than expected due to dry conditions on-Site. Dry conditions persisted into fall 2020, and as such, there was no discharge from the Site after June 2, 2020. It is recommended samples are collected from STN6 and STN6A in 2021, if conditions allow.

5. Conclusions and Recommendations

5.1 Conclusions

Based on the findings as documented in this report, the following conclusions are provided:

1. SW ECA effluent criteria (TSS, solvent extractables, phenols, and flow rate) were met during each active day of discharge from the Equalization Pond
2. Based on analysis of the daily and monthly discharge chemical monitoring data collected during the monitoring period, no detrimental long-term trends for surface water quality were identified.
3. Comparison between various on-site surface water monitoring locations indicate that the surface water quality improves as the water moves from the East Pond to the West Pond and through the SWTP and the Equalization Pond.
4. Toxicity monitoring indicates that none of the Equalization Pond samples collected in 2020 resulted in toxicity to microorganisms.
5. The surface water characterization has a limited data set, but no significant differences are noted between sampling locations.

5.2 Recommendations

The following recommendations are provided for consideration:

1. The monitoring programs detailed within this report and completed in accordance with the requirements of the MECP-approved Surface Water Monitoring Program and Surface Water Characterization Program should continue in subsequent years.



2. The Clean Harbors Compliance Manager should review the monitoring program requirements with the Clean Harbors sample staff on an annual basis to ensure that the sampling staff understands the surface water program and sample needs. This will ensure that surface water samples are not missed.
3. Sample from off-Site locations STN6 and STN6A in subsequent years, if conditions allow.

6. References

GHD. 2019 Annual Surface Water Report, Clean Harbors Lambton Facility. February 11, 2020.

GHD. Letter to Erica Carabott re: Surface Water Monitoring Program and Surface Water Characterization Program, Lambton Facility, Corunna, Ontario. December 9, 2015.

GHD (Formerly Conestoga-Rovers and Associates). Engineering and Design, Existing Conditions Report. October 2014.

Ontario Ministry of the Environment, Conservation, and Parks (MECP). Amended Environmental Compliance Approval No. 4731-BNNT5Y dated April 20, 2020.

Ontario MECP. Amended Environmental Compliance Approval No. A031806 (Waste ECA) dated October 20, 2016.

Ontario MECP. Amended Environmental Compliance Approval No. 1065-9VVJSW dated October 19, 2015.

Ontario MECP. Provincial Officer's Order No. 2681-BCPKUJ (Order), dated June 5, 2019.

Tetra Tech WEI Inc. Design and Operations Report – Lambton Landfill Expansion, Clean Harbors Canada, Inc. – Lambton Landfill Site. October 2015.



All of Which is Respectfully Submitted,

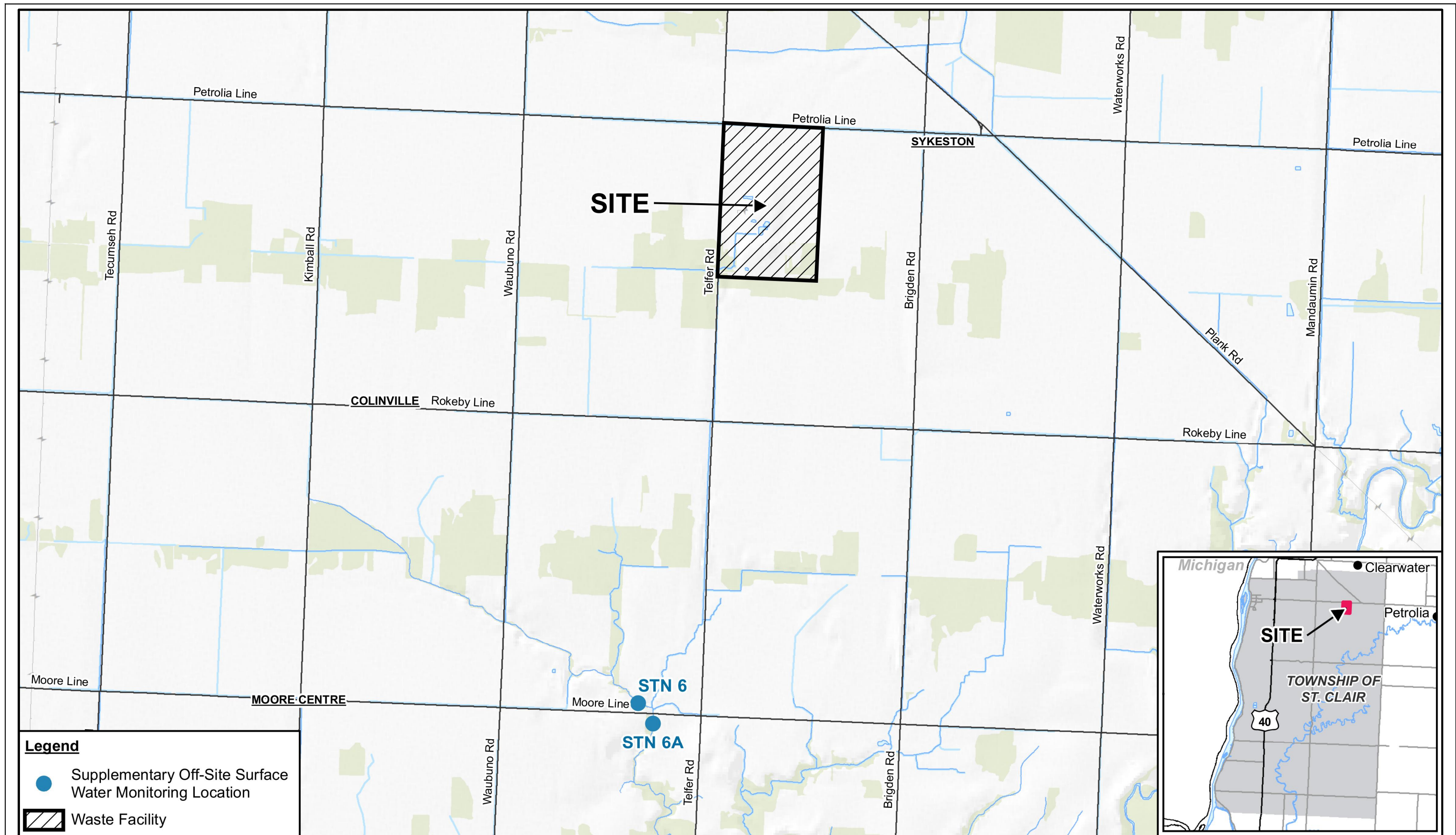
GHD

A handwritten signature in black ink, appearing to read "Meghan O'Brien", written in a cursive style.

Meghan O'Brien, B.Sc., G.I.T.

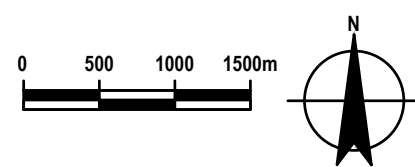


James R. Yardley, P. Eng.



Legend

- Supplementary Off-Site Surface Water Monitoring Location
- Waste Facility



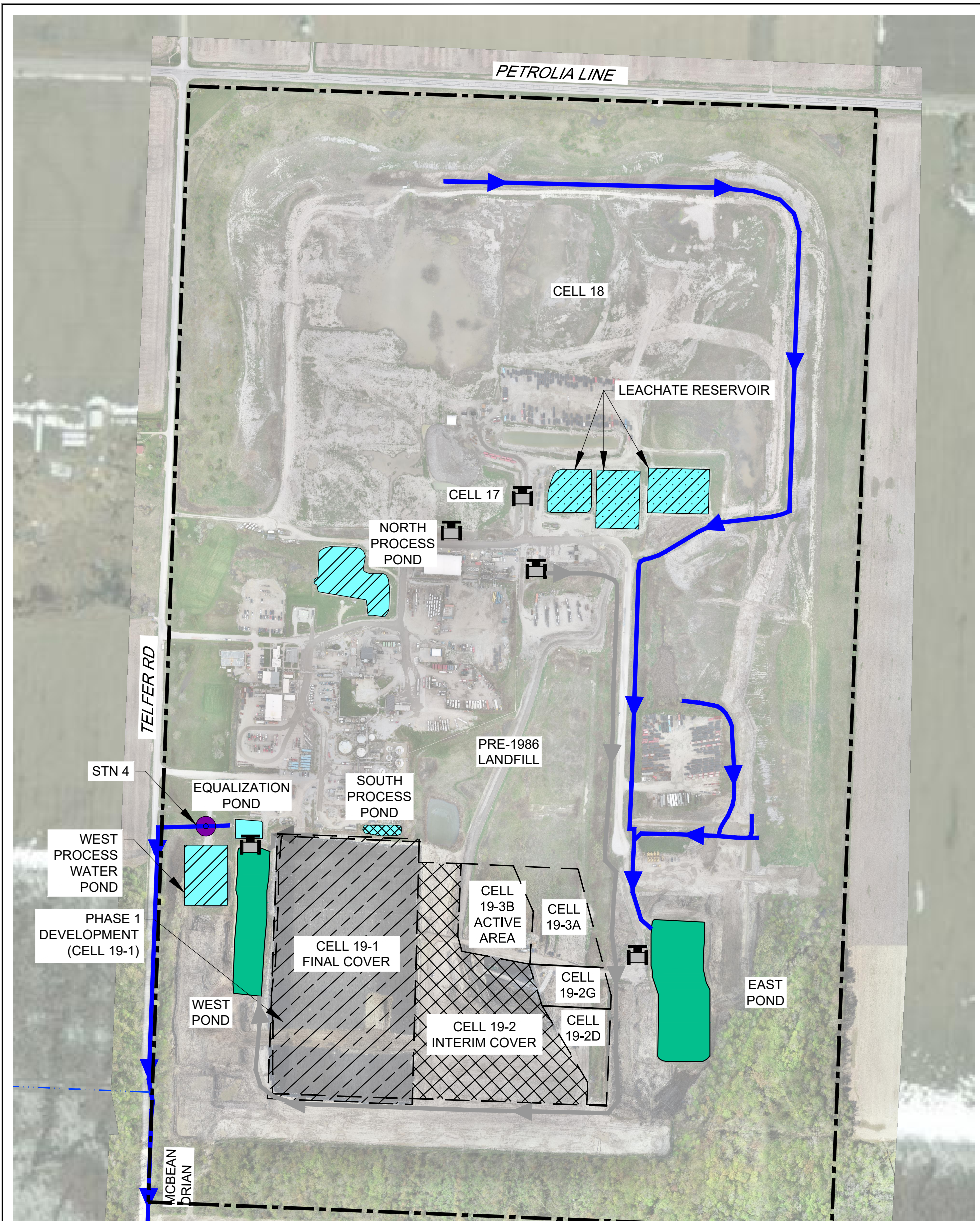
CLEAN HARBORS CANADA INC.
 LAMBTON COUNTY, ONTARIO

**2020 ANNUAL SURFACE WATER
 QUALITY MONITORING REPORT
 SITE LOCATION MAP**

Project No. 44985
 Date December 2020

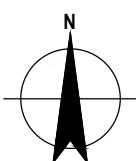
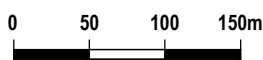
FIGURE 1

Data Source



LEGEND

- | | | | |
|--|---------------------------------|--|-----------------------------------|
| | PROPERTY LINE | | TREATED SURFACE WATER RESERVOIR |
| | WATER QUALITY STATION | | UNTREATED SURFACE WATER RESERVOIR |
| | PRE-1986 LANDFILL DITCH SYSTEM | | PROCESS RESERVOIR |
| | POST-1988 LANDFILL DITCH SYSTEM | | LEACHATE RESERVOIR |
| | PERMANENT STREAM | | FINAL COVER |
| | LOCATION OF PUMPING EQUIPMENT | | INTERIM COVER |

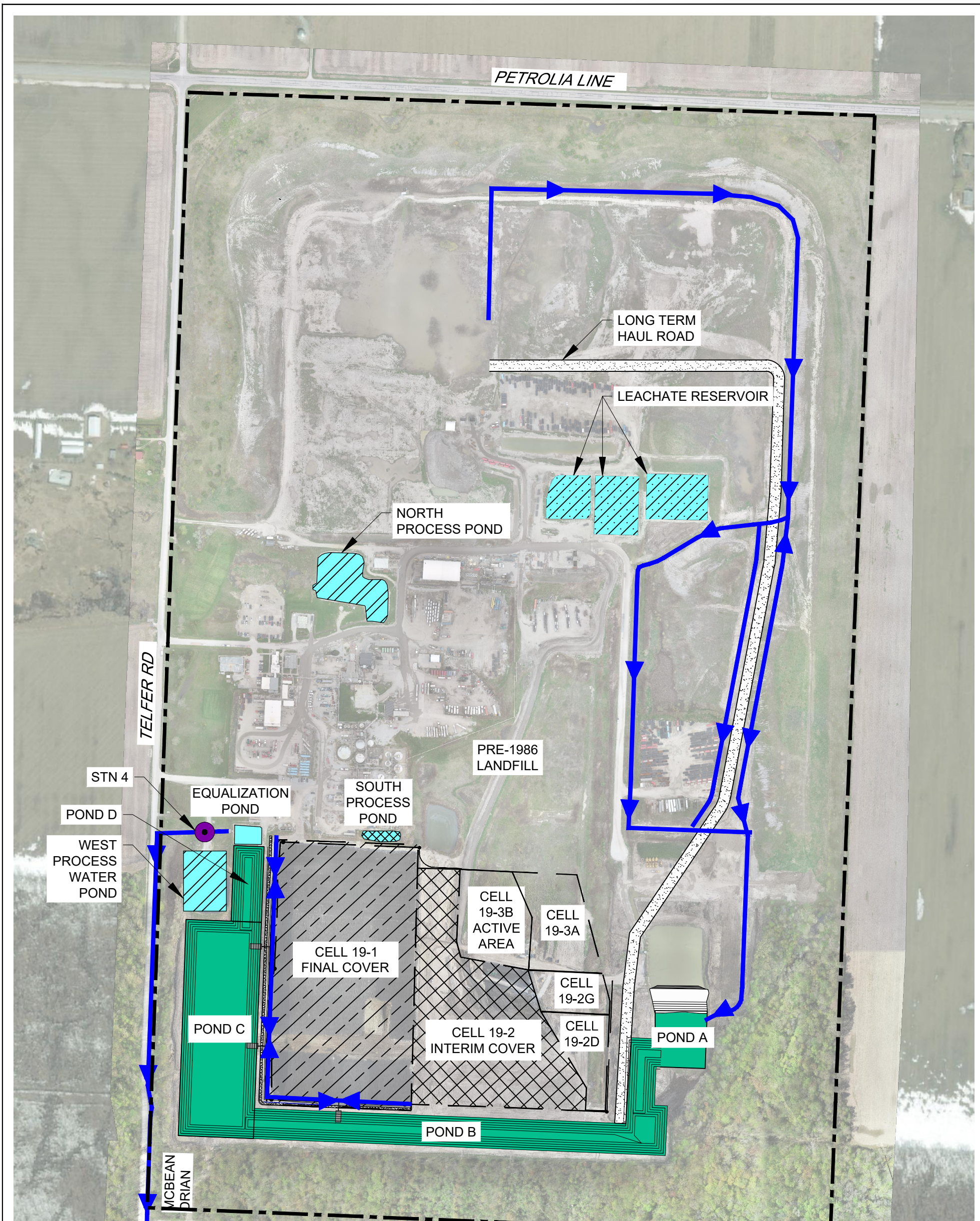


CLEAN HARBORS CANADA INC.
LAMBTON COUNTY, ONTARIO

2020 ANNUAL SURFACE WATER
QUALITY MONITORING REPORT
SURFACE WATER MANAGEMENT SYSTEM

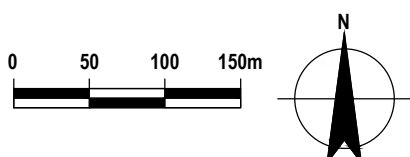
Project No. 44985
Date December 2020

FIGURE 2



LEGEND

	PROPERTY LINE		TREATED SURFACE WATER RESERVOIR
	WATER QUALITY STATION		UNTREATED SURFACE WATER RESERVOIR
	PRE-1986 LANDFILL DITCH SYSTEM		PROCESS RESERVOIR
	POST-1988 LANDFILL DITCH SYSTEM		LEACHATE RESERVOIR
	PERMANENT STREAM		FINAL COVER
	LOCATION OF PUMPING EQUIPMENT		INTERIM COVER



CLEAN HARBORS CANADA INC.
LAMBTON COUNTY, ONTARIO

2020 ANNUAL SURFACE WATER
QUALITY MONITORING REPORT
2020 CAPITAL WORKS PLAN

Project No. 44985
Date December 2020

FIGURE 3

**Surface Water Monitoring Program
2020 Annual Surface Water Quality Monitoring Report
Lambton Facility
Clean Harbors Canada Inc.**

Monitoring Location	Previous SW ECA ⁽¹⁾⁽³⁾	Current SW ECA ⁽²⁾⁽³⁾	Proposed Surface Water Sampling Program		
			Daily Discharge	Monthly Discharge	Spring and late Summer/Fall
Equalization Reservoir Discharge	pH, Conductivity, TSS, Total Phenols, Chloride, Solvent Extractables - Microtox General Chemistry Metals VOCs sVOCs	TSS, Solvent Extractables, Phenols, pH Solvent Extractables Microtox General Chemistry Metals VOCs sVOCs	■	■ ⁽⁴⁾ ■ ⁽⁴⁾ ■ ⁽⁴⁾ ■ ⁽⁴⁾ ■ ⁽⁴⁾ ■ ⁽⁴⁾	
Equalization Reservoir	Fish Presence	Fish Presence		■	
West Pond or Pond D	General Chemistry Metals VOCs sVOCs	General Chemistry Metals VOCs sVOCs		■ ■ ■ ■	
East Pond or Pond A	General Chemistry Metals VOCs sVOCs	General Chemistry Metals VOCs sVOCs		■ ■ ■ ■	
STN6 (off-site background)	General Chemistry Metals	General Chemistry Metals			■ ⁽⁵⁾ ■ ⁽⁵⁾
STN6A (off-site downstream)	General Chemistry Metals	General Chemistry Metals			■ ⁽⁵⁾ ■ ⁽⁵⁾

Notes:

1. Source: Letter to Erica Carabott, Clean Harbors Canada Inc. re: Surface Water Monitoring Program and Surface Water Characterization Program, Lambton Facility, dated December 9, 2015.
2. Source: Amended Environmental Compliance Approval No. 2985-B9KPP2 dated September 9, 2019 (Current SW ECA), Table 3.
3. General Chemistry, metals, VOC, and sVOC parameters as per detailed list provided in Table 3 of this annual report.
4. Previous SW ECA indicates that samples are to be collected prior to discharge from the Equalization Pond.
Current SW ECA indicates that samples are to be collected during a discharge event from the Equalization Pond within 25-35 days after the previous samples were collected.
5. Samples to be collected during discharge from Site and on same day as Monthly Discharge samples.

VOC - Volatile Organic Compounds
SVOC - Semi-Volatile Organic Compounds
TSS - Total Suspended Solids

Surface Water Monitoring Parameters
2020 Annual Surface Water Quality Monitoring Report
Lambton Facility
Clean Harbors Canada Inc.

Parameter	Analytes
General Chemistry Parameters	Alkalinity (total as CaCO ₃), Ammonia N, Bromide (dissolved), Chemical Oxygen Demand (COD), Chloride (dissolved), Conductivity (umhos/cm), Cyanide (total), Dissolved Organic Carbon (DOC), Fluoride, Hardness, Nitrate (as N), Nitrite (as N), pH (field), pH (lab), Phenolics (total), Phosphorus (total), Sulfate (dissolved), Temperature (field), Total Dissolved Solids (TDS), Total Kjeldahl Nitrogen (TKN), Total Suspended Solids (TSS), Un ionized Ammonia
Metals (Total)	Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium (Hexavalent), Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Vanadium, Zinc
Volatile Organic Compounds (VOC)	1,1,1,2 Tetrachloroethane, 1,1,1 Trichloroethane, 1,1,2,2 Tetrachloroethane, 1,1,2 Trichloroethane, 1,1 Dichloroethane, 1,2 Dibromoethane (Ethylene dibromide), 1,2 Dichlorobenzene, 1,2 Dichloroethane, 1,2 Dichloropropane, 1,3 Dichlorobenzene, 1,4 Dichlorobenzene, 2 Butanone (Methyl ethyl ketone), 4 Methyl 2 pentanone (Methyl isobutyl ketone), Acetone, Benzene, Bromodichloromethane, Bromoform, Bromomethane (Methyl bromide), Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform (Trichloromethane), cis 1,2 Dichloroethene, cis 1,3 Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane (CFC 12), Ethylbenzene, Hexane, m&p Xylenes, Methyl tert butyl ether (MTBE), Methylene chloride, o Xylene, Styrene, Tetrachloroethene, Toluene, trans 1,2 Dichloroethene, trans 1,3 Dichloropropene, Trichloroethene, Trichlorofluoromethane (CFC 11), Vinyl Chloride, Xylenes (total)
Semi Volatile Organic Compounds (sVOC)	1,2,4 Trichlorobenzene, 1,2 Dichlorobenzene, 1,3 Dichlorobenzene, 1,4 Dichlorobenzene, 1 Methylanthralene, 2,3,4,5 Tetrachlorophenol/2,3,4,6 Tetrachlorophenol, 2,3,6 Trichlorophenol, 2,4,5 Trichlorophenol, 2,4,6 Trichlorophenol, 2,4 Dichlorophenol, 2,4 Dimethylphenol, 2,4 Dinitrophenol, 2,4 Dinitrotoluene, 2,6 Dinitrotoluene, 2 Chlorophenol, 2 Methylanthralene, 3,3' Dichlorobenzidine, 4 Chloroaniline, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene/Benzo(j)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis(2 Chloroethoxy)ether, bis(ethylhexy)phthalate (DEHP), Chrysene, Dibenz(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Indeno(1,2,3 cd)pyrene, Naphthalene, Pentachlorophenol, Perylene, Phenanthrene, Pyrene

Source:

1. Source: Letter to Erica Carabott, Clean Harbors Canada Inc. re: Surface Water Monitoring Program and Surface Water Characterization Program, Lambton Facility, dated December 9, 2015.
2. Amended Environmental Compliance Approval No. 2985-B9KPP2 dated September 9, 2019 (Current SW ECA), Table 4.

**Daily Chemical Analysis - Equalization Pond
2020 Annual Surface Water Quality Monitoring Report
Lambton Facility
Clean Harbors Canada Inc.**

1,895,040

WASTE WATER TREATMENT PLANT - REPORT OF ANALYSIS (EQ POND)

Date	pH	Conductivity (mS/cm)	TSS (mg/L)	Phenol (mg/L)	Solvent Extractables (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Flow Rate (LPM)	Daily Flow (L)
1/13/20	7.72	0.816	8	0.0024	<5	80	155	0	0
1/14/20	7.54	0.881	7.4	0.0026	<5	78	157	1000	1,440,000
1/15/20	7.81	0.770	9.7	0.0027	<5	76	152	1220	1,756,800
1/16/20	7.68	0.700	11.4	0.001	<5	77.6	159	1150	1,656,000
1/17/20	7.73	0.630	3.3	0.0013	6.6	72.9	148	1000	1,440,000
1/18/20	7.73	0.853	2	0.0015	<5	80	167	1010	1,454,400
1/19/20	7.91	0.826	3	0.0016	<5	80	172	750	1,080,000
1/20/20	7.55	0.863	2	0.0019	<5	80	166	750	1,080,000
1/21/20	7.52	0.690	5.6	0.0013	<5	78.6	165	750	1,080,000
1/22/20	7.77	0.850	4.6	0.0013	<5	75.7	156	750	1,080,000
1/23/20	7.56	0.830	9.1	0.0016	<5	77.8	169	1100	1,584,000
1/24/20	7.57	0.835	3.7	0.0016	<5	77	159	1100	1,584,000
1/25/20	7.62	0.815	7.6	0.0017	<5	70	145	1097	1,579,680
1/26/20	7.64	0.767	3.7	0.0014	<5	71	147	750	1,080,000
1/27/20	7.71	0.730	4.9	0.0016	<5	69.5	146	1136	1,635,840
1/28/20	7.72	0.650	1.7	0.0013	<5	68.3	142	1100	1,584,000
1/29/20	7.55	0.680	0.5	0.0017	<5	68.2	141	1125	1,620,000
1/30/20	7.48	0.717	1	0.0016	<5	76	159	1105	1,591,200
1/31/20	7.96	0.778	2	0.0014	<5	71	155	1251	1,801,440
2/1/20	7.66	0.774	4	0.0017	5.6	73	152	1232	1,774,080
2/2/20	7.85	0.760	11.1	0.0017	<5	67.8	145	1265	1,821,600
2/3/20	7.83	0.750	6.7	0.0011	<5	67	145	1235	1,778,400
2/4/20	7.74	0.720	6.7	0.0011	<5	66.6	145	1160	1,670,400
2/5/20	7.56	0.727	6.9	0.0015	<5	69	150	1214	1,748,160
2/6/20	7.62	0.779	4.2	0.0011	<5	68	148	1268	1,825,920
2/7/20	7.55	0.745	6.4	<0.001	<5	68	150	1250	1,800,000
2/8/20	7.61	0.650	5.1	<0.001	<5	66.9	147	1280	1,843,200
2/9/20	7.65	0.710	6.4	0.001	<5	65.7	144	1290	1,857,600
2/10/20	7.65	0.620	3.3	0.0016	<5	66	146	1290	1,857,600
2/11/20	7.51	0.748	3	0.0012	<5	66	147	1241	1,787,040
2/12/20	7.96	0.776	5	0.001	<5	68	149	1188	1,710,720
2/13/20	7.88	0.772	3	0.0016	<5	66	147	1122	1,615,680
2/14/20	7.65	0.730	4.7	0.002	<5	64.6	144	1230	1,771,200
2/15/20	7.74	0.720	8.4	0.0018	<5	65.9	147	1130	1,627,200
2/16/20	7.72	0.740	7.8	<0.001	<5	65.7	147	1145	1,648,800
2/17/20	7.36	0.650	7.7	0.0012	<5	66.5	150	1200	1,728,000
2/18/20	7.58	0.767	3.1	0.0012	<5	65	146	1316	1,895,040
2/19/20	7.59	0.769	4.6	<0.001	<5	64	146	1220	1,756,800
2/20/20	7.63	0.720	6.9	<0.001	<5	64	145	800	1,152,000
2/21/20	7.72	0.730	5.4	0.0014	<5	66.3	150	1110	1,598,400
2/22/20	7.74	0.660	3.3	<0.001	5.4	64.1	142	1000	1,440,000
2/23/20	7.61	0.776	3	<0.001	<5	67	151	1000	1,440,000
2/24/20	7.72	0.689	2	0.001	<5	65	147	930	1,339,200
2/25/20	7.56	0.765	2	<0.001	<5	68	163	1206	1,736,640
2/26/20	7.83	0.700	10.5	0.0013	<5	66.8	157	1223	1,761,120
2/27/20	7.69	0.780	8.5	0.0011	<5	67.7	154	600	864,000
2/28/20	7.82	0.720	5.9	<0.001	<5	67	152	725	1,044,000
4/13/20	7.65	0.740	5	0	<5	62	146	0	0
4/14/20	7.64	0.730	9.1	0.002	<5	66	153	750	1,080,000
4/15/20	7.86	0.750	7.3	0.0033	<5	NA	NA	625	900,000
4/16/20	7.80	0.760	8.1	0.0019	<5	NA	NA	685	986,400

**Daily Chemical Analysis - Equalization Pond
2020 Annual Surface Water Quality Monitoring Report
Lambton Facility
Clean Harbors Canada Inc.**

1,895,040

WASTE WATER TREATMENT PLANT - REPORT OF ANALYSIS (EQ POND)

Date	pH	Conductivity (mS/cm)	TSS (mg/L)	Phenol (mg/L)	Solvent Extractables (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Flow Rate (LPM)	Daily Flow (L)
4/17/20	7.68	0.755	8.4	0.0018	<5	NA	NA	520	748,800
4/18/20	7.57	0.759	7.8	0.0015	<5	NA	NA	514	740,160
4/19/20	7.87	0.737	6.6	0.0012	<5	NA	NA	440	633,600
4/20/20	7.55	0.740	0.74	0.0013	<5	NA	NA	416	599,040
4/21/20	7.81	0.600	7.2	0.0015	<5	NA	NA	1133	1,631,520
4/22/20	7.75	0.660	7.7	0.002	<5	NA	NA	1025	1,476,000
4/23/20	7.57	0.715	5	0.001	<5	NA	NA	895	1,288,800
4/24/20	7.87	0.765	3	0.0022	<5	NA	NA	895	1,288,800
4/25/20	7.86	0.664	4	0.0013	<5	NA	NA	250	360,000
4/26/20	7.72	0.710	10	<0.001	<5	NA	NA	0	0
4/28/20	7.95	0.690	4.9	<0.001	<5	NA	NA	406	584,640
4/29/20	7.92	0.769	<1	<0.001	<5	53	127	300	432,000
4/30/20	7.95	0.784	3.5	0.0012	<5	65	148	1100	1,584,000
5/1/20	8.09	0.769	3.8	0.0012	<5	69	158	900	1,296,000
5/2/20	7.95	0.670	5.3	0.0016	<5	NA	NA	910	1,310,400
5/3/20	7.95	0.660	12.4	0.0016	<5	66.5	152	1000	1,440,000
5/4/20	7.83	0.680	5.7	0.0015	<5	64.1	146	300	432,000
5/29/20	8.14	0.822	2.4	0.0013	<5	80	174	0	0
5/30/20	8.12	0.912	6	0.0013	<5	97	201	777	1,118,880
5/31/20	7.89	0.930	2.8	<0.001	5.6	95	203	579	833,760
6/1/20	7.94	0.970	4.9	0.0019	<5	105.4	219	775	1,116,000
6/2/20	7.84	1.040	2.9	0.0016	<5	109.3	225	750	1,080,000

Notes:

Data and comments provided by Clean Harbours Canada Inc.

TSS - Total Suspended Solids

LPM - litres per minute

Phenol - Total Phenols

ppm - parts per million

Table 6

**Monthly Discharge Chemical Monitoring – Equalization Pond, General Chemistry, Metals, and VOCs/sVOCs
2020 Annual Surface Water Quality Monitoring Report
Lambton Facility
Clean Harbors Canada Inc.**

Sample Location:			EQ Pond	EQ Pond	EQ Pond	EQ Pond
Sample ID:			EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE
Sample Date:			1/13/2020	2/17/2020	4/13/2020	6/1/2020
Parameters	Units	PWQO				
General Chemistry						
Alkalinity, total (as CaCO ₃)	mg/L	-	161	168 J	150	-
Ammonia-N	mg/L	-	0.143	0.65 J	0.449	-
Bromide	mg/L	-	2.5	1.59 J	1.47	-
Chemical oxygen demand (COD)	mg/L	-	24	18 J-	25	-
Chloride	mg/L	-	79.7	65.4 J	65.4	-
Chromium VI (hexavalent)	mg/L	0.001	ND (0.00050)	0.00081 J	ND (0.00050)	-
Conductivity	umhos/cm	-	902	775 J	737	-
Cyanide (total)	mg/L	0.005	ND (0.0020)	ND (0.0020) J	ND (0.0020)	-
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	5.78	4.41 J	5.41	-
Fluoride	mg/L	-	0.732	0.546 J	0.523	-
Hardness	mg/L	-	283 J+	288 J+	280 J+	-
Nitrate (as N)	mg/L	-	0.28	0.247 J	0.111	-
Nitrite (as N)	mg/L	-	ND (0.010)	ND (0.010) J	ND (0.010)	-
pH, lab	s.u.	6.5-8.5	8.4	8.03 J	8.28	-
Phenolics (total)	mg/L	0.001	0.0022	0.0118 J	0.0021	-
Phosphorus	mg/L	0.01	0.0266	0.0328 J	0.0311	-
Sulfate	mg/L	-	159	151 J	148	-
Total dissolved solids (TDS)	mg/L	-	505	486 J	458	-
Total kjeldahl nitrogen (TKN)	mg/L	-	0.9	1.14 J	0.91	-
Total suspended solids (TSS)	mg/L	-	6.5	5.4 J	5.6	-
Un-ionized ammonia	mg/L	0.02	0.00122	0.00184 J	0.00705	-
Field Parameters						
pH, field	s.u.	6.5-8.5	7.7	7.36	7.7	-
Temperature, field	deg C	-	6.6	2.5	14.4	-
Metals						
Aluminum	mg/L	0.075	0.161	0.406	0.154	0.24
Antimony	mg/L	0.02	0.00038	0.00047	0.0004	0.00041
Arsenic	mg/L	0.005	0.00132	0.00134	0.00151	0.00158
Barium	mg/L	-	0.0625	0.059	0.0593	0.0659
Beryllium	mg/L	0.011	ND (0.00010)	ND (0.00010)	ND (0.00010)	ND (0.00010)
Bismuth	mg/L	-	ND (0.000050)	ND (0.000050)	ND (0.000050)	ND (0.000050)
Boron	mg/L	0.2	0.113	0.102	0.18	0.177
Cadmium	mg/L	0.0002	ND (0.00020)	ND (0.00020)	ND (0.00010)	ND (0.000080)
Calcium	mg/L	-	77.1	78	74.9	97.2
Cobalt	mg/L	0.0009	0.00058	0.00049	0.00035	0.00057
Copper	mg/L	0.005	0.0025	0.0025	0.0015	0.0018
Iron	mg/L	0.3	0.168	0.415	0.16	0.332
Lead	mg/L	0.005	0.00035	0.00053	0.00022	0.00044
Magnesium	mg/L	-	22.1	22.6	22.5	33.7
Manganese	mg/L	-	0.0444	0.0299	0.113	0.0685
Mercury	mg/L	0.0002	0.0000052	0.0000052	ND (0.0000050)	0.000005
Molybdenum	mg/L	0.04	0.0647	0.0731	0.0659	0.0677
Nickel	mg/L	0.025	0.00604	0.00432	0.00396	0.00612
Potassium	mg/L	-	21.3	19.3	18.1	17.7
Selenium	mg/L	0.1	0.0013	0.00134	0.00119	0.000943
Silicon	mg/L	-	0.79	2.38	1.09	2.12
Silver	mg/L	0.0001	ND (0.000050)	0.000072	ND (0.000050)	ND (0.000050)
Sodium	mg/L	-	63	44.9	43.5	63.9
Strontium	mg/L	-	0.583	0.614	0.58	0.776
Thallium	mg/L	0.0003	0.000134	0.000109	0.000099	0.000122
Tin	mg/L	-	ND (0.00010)	0.00027	0.00016	ND (0.00010)
Vanadium	mg/L	0.006	0.00053	0.00113	0.00058	0.00078
Zinc	mg/L	0.03	0.0044	0.0082	ND (0.0030)	0.0043
Volatiles						
1,1,1,2-Tetrachloroethane	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,1-Trichloroethane	ug/L	10	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,2,2-Tetrachloroethane	ug/L	70	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,2-Trichloroethane	ug/L	800	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1-Dichloroethane	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1-Dichloroethene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,2-Dibromoethane (Ethylene dibromide)	ug/L	5	ND (0.20)	ND (0.20) J	ND (0.20)	-
1,2-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,2-Dichloroethane	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)	-

**Monthly Discharge Chemical Monitoring – Equalization Pond, General Chemistry, Metals, and VOCs/sVOCs
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Clean Harbors Canada Inc.**

Sample Location: Sample ID: Sample Date:			EQ Pond EQ POND DISCHARGE 1/13/2020	EQ Pond EQ POND DISCHARGE 2/17/2020	EQ Pond EQ POND DISCHARGE 4/13/2020	EQ Pond EQ POND DISCHARGE 6/1/2020
Parameters	Units	PWQO				
1,2-Dichloropropane	ug/L	0.7	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,3-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,4-Dichlorobenzene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)	-
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	400	ND (20)	ND (20) J	ND (20)	-
2-Hexanone	ug/L	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (I	ug/L	-	ND (20)	ND (20) J	ND (20)	-
Acetone	ug/L	-	ND (20)	ND (20) J	ND (20)	-
Benzene	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)	-
Bromodichloromethane	ug/L	200	ND (1.0)	ND (1.0) J	ND (1.0)	-
Bromoform	ug/L	60	ND (1.0)	ND (1.0) J	ND (1.0)	-
Bromomethane (Methyl bromide)	ug/L	0.9	ND (0.50)	ND (0.50) J	ND (0.50)	-
Carbon disulfide	ug/L	-	-	-	-	-
Carbon tetrachloride	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
Chlorobenzene	ug/L	15	ND (0.50)	ND (0.50) J	ND (0.50)	-
Chloroethane	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Chloroform (Trichloromethane)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Chloromethane (Methyl chloride)	ug/L	700	-	-	-	-
cis-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
cis-1,3-Dichloropropene	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
Dibromochloromethane	ug/L	40	ND (1.0)	ND (1.0) J	ND (1.0)	-
Dichlorodifluoromethane (CFC-12)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Ethylbenzene	ug/L	8	ND (0.50)	ND (0.50) J	ND (0.50)	-
Hexane	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
m&p-Xylenes	ug/L	2	ND (1.0)	ND (1.0) J	ND (1.0)	-
Methyl tert butyl ether (MTBE)	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
Methylene chloride	ug/L	100	ND (2.0)	ND (2.0) J	ND (2.0)	-
o-Xylene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)	-
Styrene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)	-
Tetrachloroethene	ug/L	50	ND (0.50)	ND (0.50) J	ND (0.50)	-
Toluene	ug/L	0.8	ND (0.50)	ND (0.50) J	ND (0.50)	-
trans-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
trans-1,3-Dichloropropene	ug/L	7	ND (0.50)	ND (0.50) J	ND (0.50)	-
Trichloroethene	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)	-
Trichlorofluoromethane (CFC-11)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Trihalomethanes	ug/L	-	ND (2.0)	ND (2.0) J	ND (2.0)	-
Vinyl chloride	ug/L	600	ND (0.50)	ND (0.50) J	ND (0.50)	-
Xylenes (total)	ug/L	-	ND (1.1)	ND (1.1) J	ND (1.1)	-
Semi-Volatiles						
1,2,4-Trichlorobenzene	ug/L	0.5	ND (1.0)	ND (0.40) J	ND (0.40) J	-
1,2-Dichlorobenzene	ug/L	2.5	ND (1.0)	ND (0.40) J	ND (0.40)	-
1,3-Dichlorobenzene	ug/L	2.5	ND (1.0) J	ND (0.40) J	ND (0.40) J	-
1,4-Dichlorobenzene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)	-
1-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)	-
2,3,4,5-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,3,4,6-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,3,6-Trichlorophenol	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
2,4,5-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4,6-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4-Dichlorophenol	ug/L	0.2	ND (0.75)	ND (0.30) J	ND (0.30)	-
2,4-Dimethylphenol	ug/L	10	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4-Dinitrophenol	ug/L	-	ND (2.5)	ND (1.0) J	ND (1.0)	-
2,4-Dinitrotoluene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)	-
2,6-Dinitrotoluene	ug/L	6	ND (1.0)	ND (0.40) J	ND (0.40)	-
2-Chlorophenol	ug/L	7	ND (0.75)	ND (0.30) J	ND (0.30)	-
2-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)	-
3,3'-Dichlorobenzidine	ug/L	0.6	ND (1.0) J	ND (0.40) J	ND (0.40)	-
4-Chloroaniline	ug/L	-	ND (1.0) J	ND (0.40) J	ND (0.40)	-
Acenaphthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Acenaphthylene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Anthracene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(a)anthracene	ug/L	0.0004	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(a)pyrene	ug/L	-	ND (0.13)	ND (0.050) J	ND (0.050)	-
Benzo(b)fluoranthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(g,h,i)perylene	ug/L	2E-05	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(k)fluoranthene	ug/L	0.0002	ND (0.50)	ND (0.20) J	ND (0.20)	-
bis(2-Chloroethyl)ether	ug/L	200	ND (1.0)	ND (0.40) J	ND (0.40)	-

**Monthly Discharge Chemical Monitoring – Equalization Pond, General Chemistry, Metals, and VOCs/sVOCs
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Clean Harbors Canada Inc.**

Sample Location:	EQ Pond	EQ Pond	EQ Pond	EQ Pond		
Sample ID:	EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE		
Sample Date:	1/13/2020	2/17/2020	4/13/2020	6/1/2020		
Parameters	Units	PWQO				
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	0.6	ND (2.5)	ND (2.0) J	ND (2.0)	-
Chrysene	ug/L	0.0001	ND (0.50)	ND (0.20) J	ND (0.20)	-
Dibenz(a,h)anthracene	ug/L	0.002	ND (0.50)	ND (0.20) J	ND (0.20)	-
Diethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Dimethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Fluoranthene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)	-
Fluorene	ug/L	0.2	ND (0.50)	ND (0.20) J	ND (0.20)	-
Hexachlorobenzene	ug/L	0.0065	ND (0.10)	ND (0.040) J	ND (0.040)	-
Hexachlorobutadiene	ug/L	0.009	ND (0.50)	ND (0.20) J	ND (0.20) J	-
Indeno(1,2,3-cd)pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Naphthalene	ug/L	7	ND (0.50)	ND (0.20) J	ND (0.20)	-
Pentachlorophenol	ug/L	0.5	ND (1.3)	ND (0.50) J	ND (0.50)	-
Perylene	ug/L	7E-05	ND (0.50)	ND (0.20) J	ND (0.20)	-
Phenanthrene	ug/L	0.03	ND (0.50)	ND (0.20) J	ND (0.20)	-
Pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-

Notes:

ND = Not detected at the associated reporting limit.

J = Estimated concentration.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

- = Not applicable.

**Monthly Discharge Chemical Monitoring – Equalization Pond, Microtox
2020 Annual Surface Water Quality Monitoring Report
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Clean Harbors Canada Inc.**

Sample Location:		EQ Pond	EQ Pond	EQ Pond	EQ Pond
Sample ID:		EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE	EQ POND DISCHARGE
Sample Date:		1/13/2020	2/17/2020	4/13/2020	6/1/2020
Parameters	Units				
Clarification	none	None	Centrifged	None	None
Color (true)	none	Colorless	Colorless	Colorless	Colorless
EC 20 (15min)	%	100	100	100	100 J
EC 20 (5min)	%	100	100	100	100 J
EC 50 (15min)	%	100	100	100	100 J
EC 50 (5min)	%	100	100	100	100 J
Final pH	s.u.	8	7.6	8.1	8
Initial pH	s.u.	8	7.6	8.1	8
Interpretation	none	NON TOXIC	NON TOXIC	NON TOXIC	NON TOXIC
Turbidity	none	N/A	N/A	N/A	N/A

Notes:
N/A = Result not available.
J = Estimated concentration.

Table 8

**Surface Water Characterization – East Pond
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Clean Harbors Canada Inc.**

Sample Location:			East Pond	East Pond	East Pond	East Pond
Sample ID:			ERP-EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND
Sample Date:			1/13/2020	2/17/2020	4/13/2020	6/1/2020
Parameters	Units	PWQO				
General Chemistry						
Alkalinity, total (as CaCO3)	mg/L	-	131	145 J	145	-
Ammonia-N	mg/L	-	0.864	0.484 J	0.135	-
Bromide	mg/L	-	1.58	1.39 J	1.3	-
Chemical oxygen demand (COD)	mg/L	-	48	15 J-	32	-
Chloride	mg/L	-	64.3	65.6 J	68.6	-
Chromium VI (hexavalent)	mg/L	0.001	ND (0.00050)	0.00082 J	ND (0.00050)	-
Conductivity	umhos/cm	-	742	807 J	742	-
Cyanide (total)	mg/L	0.005	ND (0.0020)	ND (0.0020) J	ND (0.0020)	-
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	5.38	4.80 J	8.49	-
Fluoride	mg/L	-	0.495	0.512 J	0.493	-
Hardness	mg/L	-	311 J+	301 J+	285 J+	-
Nitrate (as N)	mg/L	-	0.194	0.149 J	0.044	-
Nitrite (as N)	mg/L	-	ND (0.010)	ND (0.010) J	ND (0.010)	-
pH, lab	s.u.	6.5-8.5	7.93	8.12 J	8.23	-
Phenolics (total)	mg/L	0.001	0.0046	0.0053 J	0.0024	-
Phosphorus	mg/L	0.01	0.189	0.0344 J	0.0327	-
Sulfate	mg/L	-	137	160 J	156	-
Total dissolved solids (TDS)	mg/L	-	480	486 J	473	-
Total kjeldahl nitrogen (TKN)	mg/L	-	1.81	0.90 J	0.77	-
Total suspended solids (TSS)	mg/L	-	152	8.5 J	8.1	-
Un-ionized ammonia	mg/L	0.02	0.00562	0.00430 J	0.00169	-
Field Parameters						
pH, field	s.u.	6.5-8.5	7.6	7.86	7.6	-
Temperature, field	deg C	-	6	2.5	14.4	-
Metals						
Aluminum	mg/L	0.075	5.52	0.433	0.28	1.11
Antimony	mg/L	0.02	0.00062	0.00046	0.00037	0.0005
Arsenic	mg/L	0.005	0.00373	0.00128	0.00161	0.0027
Barium	mg/L	-	0.0883	0.0574	0.0592	0.0699
Beryllium	mg/L	0.011	0.00024	ND (0.00010)	ND (0.00010)	ND (0.00010)
Bismuth	mg/L	-	0.000136	ND (0.000050)	ND (0.000050)	ND (0.000050)
Boron	mg/L	0.2	0.112	0.107	0.11	0.157
Cadmium	mg/L	0.0002	ND (0.00090)	ND (0.00030)	ND (0.00010)	ND (0.00030)
Calcium	mg/L	-	82.1	81.7	75.2	109
Cobalt	mg/L	0.0009	0.00457	0.00071	0.00047	0.00178
Copper	mg/L	0.005	0.0101	0.0024	0.0026	0.003
Iron	mg/L	0.3	8.1	0.482	0.316	1.79
Lead	mg/L	0.005	0.00926	0.00084	0.0003	0.00242
Magnesium	mg/L	-	25.8	23.5	23.7	36.4
Manganese	mg/L	-	0.167	0.0791	0.0506	0.274
Mercury	mg/L	0.0002	0.0000833	0.0000084	ND (0.0000050)	0.0000327
Molybdenum	mg/L	0.04	0.0628	0.0744	0.0605	0.0743
Nickel	mg/L	0.025	0.0158	0.00455	0.00436	0.00941
Potassium	mg/L	-	18	19.4	16.8	18.2
Selenium	mg/L	0.1	0.00152	0.0013	0.00121	0.00109
Silicon	mg/L	-	11.1	2.62	1.37	3.89
Silver	mg/L	0.0001	ND (0.000050)	ND (0.000050)	ND (0.000050)	ND (0.000050)
Sodium	mg/L	-	41.3	43	43.7	70.1
Strontium	mg/L	-	0.566	0.644	0.589	0.882
Thallium	mg/L	0.0003	0.000325	0.000117	0.000083	0.000127
Tin	mg/L	-	0.00031	0.00021	0.00035	ND (0.00010)
Vanadium	mg/L	0.006	0.0124	0.00114	0.0007	0.00264

Table 8

**Surface Water Characterization – East Pond
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Clean Harbors Canada Inc.**

Sample Location:			East Pond	East Pond	East Pond	East Pond
Sample ID:			ERP-EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND
Sample Date:			1/13/2020	2/17/2020	4/13/2020	6/1/2020
Parameters	Units	PWQO				
Zinc	mg/L	0.03	0.0457	0.0086	0.0046	0.013
Volatiles						
1,1,1,2-Tetrachloroethane	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,1-Trichloroethane	ug/L	10	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,2,2-Tetrachloroethane	ug/L	70	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1,2-Trichloroethane	ug/L	800	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1-Dichloroethane	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,1-Dichloroethene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,2-Dibromoethane (Ethylene dibromide)	ug/L	5	ND (0.20)	ND (0.20) J	ND (0.20)	-
1,2-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,2-Dichloroethane	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,2-Dichloropropane	ug/L	0.7	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,3-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)	-
1,4-Dichlorobenzene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)	-
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	400	ND (20)	ND (20) J	ND (20)	-
2-Hexanone	ug/L	-	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone) (M)	ug/L	-	ND (20)	ND (20) J	ND (20)	-
Acetone	ug/L	-	ND (20)	ND (20) J	ND (20)	-
Benzene	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)	-
Bromodichloromethane	ug/L	200	ND (1.0)	ND (1.0) J	ND (1.0)	-
Bromoform	ug/L	60	ND (1.0)	ND (1.0) J	ND (1.0)	-
Bromomethane (Methyl bromide)	ug/L	0.9	ND (0.50)	ND (0.50) J	ND (0.50)	-
Carbon disulfide	ug/L	-	-	-	-	-
Carbon tetrachloride	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
Chlorobenzene	ug/L	15	ND (0.50)	ND (0.50) J	ND (0.50)	-
Chloroethane	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Chloroform (Trichloromethane)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Chloromethane (Methyl chloride)	ug/L	700	-	-	-	-
cis-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
cis-1,3-Dichloropropene	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
Dibromochloromethane	ug/L	40	ND (1.0)	ND (1.0) J	ND (1.0)	-
Dichlorodifluoromethane (CFC-12)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Ethylbenzene	ug/L	8	ND (0.50)	ND (0.50) J	ND (0.50)	-
Hexane	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
m&p-Xylenes	ug/L	2	ND (1.0)	ND (1.0) J	ND (1.0)	-
Methyl tert butyl ether (MTBE)	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
Methylene chloride	ug/L	100	ND (2.0)	ND (2.0) J	ND (2.0)	-
o-Xylene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)	-
Styrene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)	-
Tetrachloroethene	ug/L	50	ND (0.50)	ND (0.50) J	ND (0.50)	-
Toluene	ug/L	0.8	ND (0.50)	ND (0.50) J	ND (0.50)	-
trans-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)	-
trans-1,3-Dichloropropene	ug/L	7	ND (0.50)	ND (0.50) J	ND (0.50)	-
Trichloroethene	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)	-
Trichlorofluoromethane (CFC-11)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)	-
Trihalomethanes	ug/L	-	ND (2.0)	ND (2.0) J	ND (2.0)	-
Vinyl chloride	ug/L	600	ND (0.50)	ND (0.50) J	ND (0.50)	-
Xylenes (total)	ug/L	-	ND (1.1)	ND (1.1) J	ND (1.1)	-
Semi-Volatiles						
1,2,4-Trichlorobenzene	ug/L	0.5	ND (1.0)	ND (0.40) J	ND (0.40) J	-
1,2-Dichlorobenzene	ug/L	2.5	ND (1.0)	ND (0.40) J	ND (0.40)	-
1,3-Dichlorobenzene	ug/L	2.5	ND (1.0) J	ND (0.40) J	ND (0.40) J	-
1,4-Dichlorobenzene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)	-

Table 8

**Surface Water Characterization – East Pond
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Clean Harbors Canada Inc.**

Sample Location:			East Pond	East Pond	East Pond	East Pond
Sample ID:			ERP-EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND	EAST STORM WATER POND
Sample Date:			1/13/2020	2/17/2020	4/13/2020	6/1/2020
Parameters	Units	PWQO				
1-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)	-
2,3,4,5-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,3,4,6-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,3,6-Trichlorophenol	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)	-
2,4,5-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4,6-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4-Dichlorophenol	ug/L	0.2	ND (0.75)	ND (0.30) J	ND (0.30)	-
2,4-Dimethylphenol	ug/L	10	ND (1.3)	ND (0.50) J	ND (0.50)	-
2,4-Dinitrophenol	ug/L	-	ND (2.5)	ND (1.0) J	ND (1.0)	-
2,4-Dinitrotoluene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)	-
2,6-Dinitrotoluene	ug/L	6	ND (1.0)	ND (0.40) J	ND (0.40)	-
2-Chlorophenol	ug/L	7	ND (0.75)	ND (0.30) J	ND (0.30)	-
2-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)	-
3,3'-Dichlorobenzidine	ug/L	0.6	ND (1.0) J	ND (0.40) J	ND (0.40)	-
4-Chloroaniline	ug/L	-	ND (1.0) J	ND (0.40) J	ND (0.40)	-
Acenaphthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Acenaphthylene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Anthracene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(a)anthracene	ug/L	0.0004	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(a)pyrene	ug/L	-	ND (0.13)	ND (0.050) J	ND (0.050)	-
Benzo(b)fluoranthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(g,h,i)perylene	ug/L	0.00002	ND (0.50)	ND (0.20) J	ND (0.20)	-
Benzo(k)fluoranthene	ug/L	0.0002	ND (0.50)	ND (0.20) J	ND (0.20)	-
bis(2-Chloroethyl)ether	ug/L	200	ND (1.0)	ND (0.40) J	ND (0.40)	-
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	0.6	ND (2.5)	ND (2.0) J	ND (2.0)	-
Chrysene	ug/L	0.0001	ND (0.50)	ND (0.20) J	ND (0.20)	-
Dibenz(a,h)anthracene	ug/L	0.002	ND (0.50)	ND (0.20) J	ND (0.20)	-
Diethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Dimethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Fluoranthene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)	-
Fluorene	ug/L	0.2	ND (0.50)	ND (0.20) J	ND (0.20)	-
Hexachlorobenzene	ug/L	0.0065	ND (0.10)	ND (0.040) J	ND (0.040)	-
Hexachlorobutadiene	ug/L	0.009	ND (0.50)	ND (0.20) J	ND (0.20) J	-
Indeno(1,2,3-cd)pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-
Naphthalene	ug/L	7	ND (0.50)	ND (0.20) J	ND (0.20)	-
Pentachlorophenol	ug/L	0.5	ND (1.3)	ND (0.50) J	ND (0.50)	-
Perylene	ug/L	0.00007	ND (0.50)	ND (0.20) J	ND (0.20)	-
Phenanthrene	ug/L	0.03	ND (0.50)	ND (0.20) J	ND (0.20)	-
Pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)	-

Notes:
 ND = Not detected at the associated reporting limit.
 J = Estimated concentration.
 J+ = The result is an estimated quantity, but the result may be biased high.
 J- = The result is an estimated quantity, but the result may be biased low.
 - = Not applicable.

Table 9

**Surface Water Characterization – West Pond
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Lambton Facility
Clean Harbors Canada Inc.**

Sample Location:	West Pond		West Pond	West Pond	
Sample ID:	WEST STORM WATER POND		WEST STORM WATER POND	WEST STORM WATER POND	
Sample Date:	1/13/2020		2/17/2020	4/13/2020	
Parameters	Units	PWQO			
General Chemistry					
Alkalinity, total (as CaCO ₃)	mg/L	-	160	128 J	189
Ammonia-N	mg/L	-	0.357	0.66 J	0.271
Bromide	mg/L	-	2.41	1.56 J	0.9
Chemical oxygen demand (COD)	mg/L	-	26	16 J-	37
Chloride	mg/L	-	80.8	65.4 J	86.8
Chromium VI (hexavalent)	mg/L	0.001	0.00129	0.00091 J	ND (0.00050)
Conductivity	umhos/cm	-	918	777 J	987
Cyanide (total)	mg/L	0.005	ND (0.0020)	ND (0.0020) J	ND (0.0020)
Dissolved organic carbon (DOC) (dissolved)	mg/L	-	6.55	5.13 J	7.86
Fluoride	mg/L	-	0.667	0.537 J	0.578
Hardness	mg/L	-	293 J+	289 J+	429 J+
Nitrate (as N)	mg/L	-	0.112	0.162 J	0.082
Nitrite (as N)	mg/L	-	ND (0.010)	ND (0.010) J	ND (0.010)
pH, lab	s.u.	6.5-8.5	8.26	8.08 J	8.17
Phenolics (total)	mg/L	0.001	0.0031	0.0087 J	0.0022
Phosphorus	mg/L	0.01	0.0522	0.0323 J	0.0531
Sulfate	mg/L	-	169	152 J	226
Total dissolved solids (TDS)	mg/L	-	529	454 J	666
Total kjeldahl nitrogen (TKN)	mg/L	-	1.05	1.10 J	0.85
Total suspended solids (TSS)	mg/L	-	12	5.9 J	17.6
Un-ionized ammonia	mg/L	0.02	0.00404	0.00325 J	0.00584
Field Parameters					
pH, field	s.u.	6.5-8.5	7.8	7.6	7.8
Temperature, field	deg C	-	7.2	2.5	15.6
Metals					
Aluminum	mg/L	0.075	1.08	0.461	1.36
Antimony	mg/L	0.02	0.00046	0.00047	0.00053
Arsenic	mg/L	0.005	0.00266	0.00139	0.00191
Barium	mg/L	-	0.0735	0.0607	0.0766
Beryllium	mg/L	0.011	ND (0.00010)	ND (0.00010)	ND (0.00010)
Bismuth	mg/L	-	0.000051	ND (0.000050)	ND (0.000050)
Boron	mg/L	0.2	0.107	0.106	0.133
Cadmium	mg/L	0.0002	ND (0.00040)	ND (0.00020)	ND (0.00030)
Calcium	mg/L	-	77.7	77.9	114
Cobalt	mg/L	0.0009	0.00113	0.00054	0.00121
Copper	mg/L	0.005	0.004	0.0022	0.0346
Iron	mg/L	0.3	1.26	0.395	1.6
Lead	mg/L	0.005	0.00226	0.00062	0.00345
Magnesium	mg/L	-	24	23.1	35.3
Manganese	mg/L	-	0.0473	0.0394	0.112
Mercury	mg/L	0.0002	0.0000583	0.000052	0.0000238
Molybdenum	mg/L	0.04	0.063	0.073	0.0688
Nickel	mg/L	0.025	0.00744	0.00452	0.00739
Potassium	mg/L	-	20.4	19.9	19.3
Selenium	mg/L	0.1	0.0017	0.00138	0.00121
Silicon	mg/L	-	2.87	2.55	4.31
Silver	mg/L	0.0001	ND (0.000050)	ND (0.000050)	ND (0.000050)
Sodium	mg/L	-	59.4	45.2	57
Strontium	mg/L	-	0.579	0.614	0.861
Thallium	mg/L	0.0003	0.000123	0.000108	0.000201
Tin	mg/L	-	0.00017	0.00015	0.00131
Vanadium	mg/L	0.006	0.00256	0.00117	0.00304
Zinc	mg/L	0.03	0.0107	0.0072	0.0137
Volatiles					
1,1,1,2-Tetrachloroethane	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)
1,1,1-Trichloroethane	ug/L	10	ND (0.50)	ND (0.50) J	ND (0.50)
1,1,2,2-Tetrachloroethane	ug/L	70	ND (0.50)	ND (0.50) J	ND (0.50)
1,1,2-Trichloroethane	ug/L	800	ND (0.50)	ND (0.50) J	ND (0.50)
1,1-Dichloroethane	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)
1,1-Dichloroethene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)
1,2-Dibromoethane (Ethylene dibromide)	ug/L	5	ND (0.20)	ND (0.20) J	ND (0.20)
1,2-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)
1,2-Dichloroethane	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)
1,2-Dichloropropane	ug/L	0.7	ND (0.50)	ND (0.50) J	ND (0.50)

Table 9

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Sample Location: Sample ID: Sample Date:			West Pond WEST STORM WATER POND 1/13/2020	West Pond WEST STORM WATER POND 2/17/2020	West Pond WEST STORM WATER POND 4/13/2020
Parameters	Units	PWQO			
1,3-Dichlorobenzene	ug/L	2.5	ND (0.50)	ND (0.50) J	ND (0.50)
1,4-Dichlorobenzene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)
2-Butanone (Methyl ethyl ketone) (MEK)	ug/L	400	ND (20)	ND (20) J	ND (20)
2-Hexanone	ug/L	-	-	-	-
4-Methyl-2-pentanone (Methyl isobutyl ketone)	ug/L	-	ND (20)	ND (20) J	ND (20)
Acetone	ug/L	-	ND (20)	ND (20) J	ND (20)
Benzene	ug/L	100	ND (0.50)	ND (0.50) J	ND (0.50)
Bromodichloromethane	ug/L	200	ND (1.0)	ND (1.0) J	ND (1.0)
Bromoform	ug/L	60	ND (1.0)	ND (1.0) J	ND (1.0)
Bromomethane (Methyl bromide)	ug/L	0.9	ND (0.50)	ND (0.50) J	ND (0.50)
Carbon disulfide	ug/L	-	-	-	-
Carbon tetrachloride	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)
Chlorobenzene	ug/L	15	ND (0.50)	ND (0.50) J	ND (0.50)
Chloroethane	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)
Chloroform (Trichloromethane)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)
Chloromethane (Methyl chloride)	ug/L	700	-	-	-
cis-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)
cis-1,3-Dichloropropene	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)
Dibromochloromethane	ug/L	40	ND (1.0)	ND (1.0) J	ND (1.0)
Dichlorodifluoromethane (CFC-12)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)
Ethylbenzene	ug/L	8	ND (0.50)	ND (0.50) J	ND (0.50)
Hexane	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)
m&p-Xylenes	ug/L	2	ND (1.0)	ND (1.0) J	ND (1.0)
Methyl tert butyl ether (MTBE)	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)
Methylene chloride	ug/L	100	ND (2.0)	ND (2.0) J	ND (2.0)
o-Xylene	ug/L	40	ND (0.50)	ND (0.50) J	ND (0.50)
Styrene	ug/L	4	ND (0.50)	ND (0.50) J	ND (0.50)
Tetrachloroethene	ug/L	50	ND (0.50)	ND (0.50) J	ND (0.50)
Toluene	ug/L	0.8	ND (0.50)	ND (0.50) J	ND (0.50)
trans-1,2-Dichloroethene	ug/L	200	ND (0.50)	ND (0.50) J	ND (0.50)
trans-1,3-Dichloropropene	ug/L	7	ND (0.50)	ND (0.50) J	ND (0.50)
Trichloroethene	ug/L	20	ND (0.50)	ND (0.50) J	ND (0.50)
Trichlorofluoromethane (CFC-11)	ug/L	-	ND (1.0)	ND (1.0) J	ND (1.0)
Trihalomethanes	ug/L	-	ND (2.0)	ND (2.0) J	ND (2.0)
Vinyl chloride	ug/L	600	ND (0.50)	ND (0.50) J	ND (0.50)
Xylenes (total)	ug/L	-	ND (1.1)	ND (1.1) J	ND (1.1)
Semi-Volatiles					
1,2,4-Trichlorobenzene	ug/L	0.5	ND (1.0)	ND (0.40) J	ND (0.40) J
1,2-Dichlorobenzene	ug/L	2.5	ND (1.0)	ND (0.40) J	ND (0.40)
1,3-Dichlorobenzene	ug/L	2.5	ND (1.0) J	ND (0.40) J	ND (0.40) J
1,4-Dichlorobenzene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)
1-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)
2,3,4,5-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)
2,3,4,6-Tetrachlorophenol	ug/L	-	ND (1.3)	ND (0.50) J	ND (0.50)
2,3,6-Trichlorophenol	ug/L	-	ND (0.50)	ND (0.50) J	ND (0.50)
2,4,5-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)
2,4,6-Trichlorophenol	ug/L	18	ND (1.3)	ND (0.50) J	ND (0.50)
2,4-Dichlorophenol	ug/L	0.2	ND (0.75)	ND (0.30) J	ND (0.30)
2,4-Dimethylphenol	ug/L	10	ND (1.3)	ND (0.50) J	ND (0.50)
2,4-Dinitrophenol	ug/L	-	ND (2.5)	ND (1.0) J	ND (1.0)
2,4-Dinitrotoluene	ug/L	4	ND (1.0)	ND (0.40) J	ND (0.40)
2,6-Dinitrotoluene	ug/L	6	ND (1.0)	ND (0.40) J	ND (0.40)
2-Chlorophenol	ug/L	7	ND (0.75)	ND (0.30) J	ND (0.30)
2-Methylnaphthalene	ug/L	2	ND (1.0)	ND (0.40) J	ND (0.40)
3,3'-Dichlorobenzidine	ug/L	0.6	ND (1.0) J	ND (0.40) J	ND (0.40)
4-Chloroaniline	ug/L	-	ND (1.0) J	ND (0.40) J	ND (0.40)
Acenaphthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Acenaphthylene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Anthracene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)
Benzo(a)anthracene	ug/L	0.0004	ND (0.50)	ND (0.20) J	ND (0.20)
Benzo(a)pyrene	ug/L	-	ND (0.13)	ND (0.050) J	ND (0.050)
Benzo(b)fluoranthene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Benzo(g,h,i)perylene	ug/L	2E-05	ND (0.50)	ND (0.20) J	ND (0.20)
Benzo(k)fluoranthene	ug/L	0.0002	ND (0.50)	ND (0.20) J	ND (0.20)
bis(2-Chloroethyl)ether	ug/L	200	ND (1.0)	ND (0.40) J	ND (0.40)
bis(2-Ethylhexyl)phthalate (DEHP)	ug/L	0.6	ND (2.5)	ND (2.0) J	ND (2.0)
Chrysene	ug/L	0.0001	ND (0.50)	ND (0.20) J	ND (0.20)

Table 9

**Surface Water Characterization – West Pond
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Sample Location: Sample ID: Sample Date:			West Pond WEST STORM WATER POND 1/13/2020	West Pond WEST STORM WATER POND 2/17/2020	West Pond WEST STORM WATER POND 4/13/2020
Parameters	Units	PWQO			
Dibenz(a,h)anthracene	ug/L	0.002	ND (0.50)	ND (0.20) J	ND (0.20)
Diethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Dimethyl phthalate	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Fluoranthene	ug/L	0.0008	ND (0.50)	ND (0.20) J	ND (0.20)
Fluorene	ug/L	0.2	ND (0.50)	ND (0.20) J	ND (0.20)
Hexachlorobenzene	ug/L	0.0065	ND (0.10)	ND (0.040) J	ND (0.040)
Hexachlorobutadiene	ug/L	0.009	ND (0.50)	ND (0.20) J	ND (0.20) J
Indeno(1,2,3-cd)pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)
Naphthalene	ug/L	7	ND (0.50)	ND (0.20) J	ND (0.20)
Pentachlorophenol	ug/L	0.5	ND (1.3)	ND (0.50) J	ND (0.50)
Perylene	ug/L	7E-05	ND (0.50)	ND (0.20) J	ND (0.20)
Phenanthrene	ug/L	0.03	ND (0.50)	ND (0.20) J	ND (0.20)
Pyrene	ug/L	-	ND (0.50)	ND (0.20) J	ND (0.20)

Notes:

ND = Not detected at the associated reporting limit.

J = Estimated concentration.

J+ = The result is an estimated quantity, but the result may be biased high.

J- = The result is an estimated quantity, but the result may be biased low.

- = Not applicable.

Appendices

Appendix A
Letter to Erica Carabott from GHD Re: Surface
Water Monitoring Program and Surface Water
Characterization Program
dated December 9, 2015



December 9, 2015

Reference No. 044985

Ms. Erica Carabott
Facility Compliance Manager
Clean Harbors Canada, Inc.
4090 Telfer Road, RR #1
Corunna, Ontario
N0N 1G0

Dear Ms. Carabott:

**Re: Surface Water Monitoring Program and Surface Water Characterization Program
Lambton Facility, Corunna, Ontario**

1. Introduction

Clean Harbors Canada Inc. (Clean Harbors) operates a hazardous waste disposal facility in Corunna, Ontario. The solid hazardous waste landfill component located at the facility operates in accordance with ECA A031806 (Waste ECA) issued by the Ministry of Environment and Climate Change (MOECC). The most recent amendment is Notice 9 dated October 19, 2015. The surface water management system at the facility is operated and management in accordance with ECA 1065-9VVJSW dated October 19, 2015 (SW ECA). Both the Waste and SW ECA have conditions that relate to surface water monitoring requirements.

Condition 9(a)(i) of the Waste ECA requires that by December 15, 2015 Clean Harbors submit an updated surface water monitoring program to the Regional Director for approval, while Condition 8 of the SW ECA requires that within six (6) months of issuance that Clean Harbors prepare and submit to the Director for approval a proposal for the characterization of storm water from the facility. This letter provides the proposed surface water monitoring program (Section 3.1) and the proposed storm water characterization program (Section 3.2).

2. Current Surface Water Monitoring Program

The surface water monitoring program that was conducted in 2015 was developed over the years and reflects monitoring requirements that were initiated to address a specific issue or to understand how the surface water system was operating after initial construction. Portions of the surface water monitoring program were conducted as a result of ECA requirements, while other portions were conducted by Clean Harbors based on their decisions over the years.

The surface water management system at the facility is unique when compared to other surface water management systems at waste disposal operations in Ontario. All surface water released from the

facility is required to be treated prior to discharge; as well, surface water is used as quench water for the incinerator during portions of the year. In addition, the surface water system is designed to accommodate the final landfill design, thus providing additional storage during the active disposal period. As such, the facility has large surface water storage ponds and historically discharges treated surface water during May to September of each year with no to minimal discharge during the October to April period.

The surface water at the facility represents water generated during precipitation events from the perimeter buffer zones and portions of the disposal area that have final or interim cover applied. Storm water from areas of the facility that are active with regard to waste movement and disposal operations have a separate water collection and storage system and the water is classified as process water. Water that is generated from the active disposal cells is classified as leachate and stored within covered leachate ponds. Both the process water and leachate generated are disposed of in the incinerator.

Understanding the operation of the surface water system is a key component that must be incorporated into the monitoring and characterization programs. Attachment A provides the current configuration of the surface water system (prior to construction of works proposed in the Waste ECA and SW ECA). Amendments to the surface water system will be conducted as the active disposal area moves to that specific area of the Site.

The current surface water monitoring program conducted is based on monitoring events being conducted when a discharge from the facility is occurring. The monitoring consists of daily monitoring of key indicator parameters associated with surface water quality, monitoring of chemical parameters during the initial discharge and later during the discharge period for both on-site and off-site locations, monitoring of acute and chronic toxicity of the discharge, and benthic monitoring of the Equalization Pond (EQ Pond) that stores the treated water prior to discharge. Table 1 provides a summary of the current monitoring program for reference purposes.

3. Surface Water Monitoring and Characterization Program

3.1 Surface Water Monitoring

A review of the last few surface water annual reports and associated data was provided to assess the general surface water quality and the value of specific tests, as well as how the surface water system operates, and will operate in the future. Monitoring results have not indicated an issue with the surface water quality over the years. When issues have been noted, operational adjustments have been made to eliminate the potential source/concern with the objective of maintaining a satisfactory surface water quality for the overall facility.

Surface water is stored for the majority of the year and the treated surface water is mainly discharged during the spring/summer periods. As such, the surface water discharge quality is not influenced by a specific precipitation event, but provides a normal or consistent quality for a period of time and year over year. Acute and chronic toxicity have been conducted for more than 15 years and have not indicated issues. As such acute and chronic toxicity monitoring is proposed to be removed from the monitoring program, and be replaced with additional assessment of chemical parameters that will

allow trends and early detection of potential concerns. As well, the EQ pond currently has a sustainable fish population and the presence of fish provide a general indicator of toxicity to aquatic species.

The proposed surface water monitoring program for the Site is summarized on Table 2. The monitoring consists of daily discharge monitoring, monthly discharge monitoring conducted during discharge periods at on-site locations, and seasonal monitoring at off-site locations. The following section provides information with regard to the proposed surface water monitoring program.

3.1.1 Daily Discharge Monitoring

Location: EQ Pond discharge

Frequency: Daily when the EQ Pond is discharging to the off-site drainage ditch

Parameters: pH, specific conductivity, total suspended solids (TSS), phenols, chloride, and solvent extractables (oil & grease). Analysis to be conducted by either Clean Harbors laboratory or external laboratory.

Rationale: The parameters represent routine parameters that are representative of general surface water quality during the discharge period and will indicate the overall performance of the treatment plant. Four parameters have established site specific discharge criteria – pH, TSS, phenols, solvent extractables.

3.1.2 Monthly Discharge Monitoring

The monthly discharge monitoring program consists of three components: chemical parameter monitoring, toxicity monitoring and visual monitoring.

3.1.2.1 Monthly Discharge Chemical Monitoring

Location: EQ Pond discharge, West Storm Water Pond, East Storm Water Pond

Frequency: a) Prior to discharge, within 25 to 35 days after discharge commencement, and within 25 to 35 days after the previous sample collection when discharge occurring.

b) If discharge ceases for less than 30 days and discharge recommences, the initial monitoring schedule shall continue. If discharge ceases for greater than 30 days, monitoring shall revert as per item a)

c) Discharge to commence after initial sample results received and forwarded to MOECC.

Parameters: General Chemistry, total metals, volatile organic compounds (VOC), and semi-volatile organic compounds (sVOC) as specified in Table 3. Analytical testing to be conducted by external Canadian certified laboratory

Rationale: Provides a detailed chemical profile of the water prior to and during discharge periods for both pre- and post-treatment of the water. Parameters represent chemical

constituents that are accepted at the facility and as such may be present in the surface water system.

3.1.2.2 Toxicity Monitoring

Location: EQ Pond discharge

Frequency: As per the Monthly Discharge Chemical Monitoring Program

Parameters: Microtox for fresh water in accordance with Environment Canada test method and protocols

Rationale: Monitors the overall water quality toxicity with an approved program

3.1.2.3 Visual Observations

Location: EQ Pond

Frequency: As per the Monthly Discharge Chemical Monitoring Program

Parameters: Presence/ absence of fish in the EQ Pond through observation with food application at several locations around the EQ Pond perimeter

Rationale: Monitors whether fish are present in the pond and a general understanding of the overall health of the EQ Pond and water quality with regard to aquatic life

3.1.3 Off-Site Surface Water Monitoring

Location: STN6 (upstream of discharge) and STN6A (downstream of discharge). See Attachment A for monitoring locations.

Frequency: Two samples per year, one in the spring and one in the late summer/fall period. Samples to be collected when a discharge is occurring and on the same day as the monthly discharge samples are collected. The time period between the spring and late summer/fall sample should be a minimum of 80 days.

Parameters: General Chemistry, total metals, volatile organic compounds (VOC), and semi-volatile organic compounds (sVOC) as specified in Table 3. Analytical testing to be conducted by external Canadian certified laboratory

Rationale: Provides a detailed chemical profile of the water in a downstream drainage system prior to and after the discharge of water from the drainage ditch that serves the facility. Parameters are consistent with the discharge monitoring parameters.

3.2 Surface Water Characterization Program

The surface water characterization program noted in Condition 8 of the SW ECA relates to concerns expressed during the vertical expansion approval and the potential changes that may occur with the surface water management system due to changes in the landfill operations and methods. A key

concern is the potential for dust/operational impacts since the initial disposal cells (Cell 19 and 20) are in close proximity to the West Surface Water Pond, which is the main surface water storage pond prior to water treatment, and these cells will be filled in the first five years of the landfill expansion program.

Review of historic data associated with the Clean Harbors facility with regard to surface water and process water quality have indicated that metals are the dominate set of parameters that change as a result of operational changes or changes in disposal location. The VOC and sVOC parameters also indicate some differences, but these are sporadic and low level (below criteria).

As such, the surface water characterization program proposed has been incorporated within the surface water monitoring program by monitoring the East and West Surface Water Ponds prior to and during discharge periods for general chemistry, metals, VOCs, and sVOCs. These represent periods when water is present within the ponds, or in the case of pre-discharge, a period of long-term water storage. The monitoring for a period of five years after commencement of the landfill expansion will allow a database to be established that will provide a long-term database for the new surface water management set-up. Amendments to the surface water characterization program that is part of the surface water monitoring program will be handled through the annual monitoring program and any modifications would require the approval of the Regional Director.

3.3 Amendments to Surface Water Monitoring Program

Once a five year database of surface water monitoring post-commencement of the landfill expansion has been collected, Clean Harbors may assess the data and recommend changes to the surface water monitoring program. The assessment will be conducted as part of the Annual Report and specific amendments to the surface water program will be provided in the report recommendations section. Changes to the surface water monitoring program will require review by MOECC Regional staff and approval of the recommendations by the Regional Director.

Clean Harbors may collect additional surface water samples that relate to specific events or to collect additional information with regard to the management and operation of the surface water system. These additional events/ samples will only become part of the official monitoring program if recommended by Clean Harbors in the Annual Report and approved by the Regional Director.

3.4 Annual Reporting

Annual reporting shall continue to be conducted in accordance with Condition 15 of the Waste ECA.

4. Summary

A revised surface water monitoring program has been developed that addresses the surface water characterization concerns and adjusts the program to be proactive in data collection so that trends and changing conditions can be monitored to assess performance and make adjustments that are beneficial to the natural environment.

The revised program is presented on Tables 2 and 3.

Should you have any questions or comments with respect to the work program proposed, please do not hesitate to contact the undersigned.

Sincerely,

GHD

A handwritten signature in blue ink that reads "James R. Yardley". The signature is fluid and cursive, with the first name "James" and last name "Yardley" clearly legible.

James R. Yardley

JRY/mg/2

cc: Mike Parker, Clean Harbors Canada

**Current Surface Water Monitoring Program
Lambton Facility, Clean Harbors**

Monitoring Location	Parameter	Current Surface Water Sampling Program		
		Daily During Discharge	Spring	Fall
EQ Pond Discharge	pH, conductivity, TSS, Total phenols, chloride, sulphate, solvent extractables, COD Microtox Acute Toxicity - 96 hr - Rainbow Trout Acute Toxicity - 48 hr - Daphnia Magna Chronic Toxicity - 7 day - Flathead Minnows Chronic Toxicity - 7 day - Ceriodaphnia Dubia Free cyanide, nitrite, nitrate, TKN, Metals	<ul style="list-style-type: none"> ■ ■ 	<ul style="list-style-type: none"> ■ consecutive day samples ■ consecutive day samples ■ ■ ■ consecutive day samples ■ consecutive day samples 	<ul style="list-style-type: none"> ■ consecutive day samples ■ consecutive day samples ■ consecutive day samples ■ consecutive day samples
EQ Pond	Benthic Invertebrates Fish Presence Dissolved Oxygen Profile Secchi depth profile		<ul style="list-style-type: none"> ■ ■ ■ ■ 	
Effluent from SWTP	General Chemistry (1) Metals sVOCs Pesticides		<ul style="list-style-type: none"> ■ ■ ■ ■ 	<ul style="list-style-type: none"> ■ ■ ■ ■
Influent to SWTP	General Chemistry (1) Metals sVOCs Pesticides		<ul style="list-style-type: none"> ■ ■ ■ ■ 	<ul style="list-style-type: none"> ■ ■ ■ ■
STN6 (off-site background)	General Chemistry (1) Metals		<ul style="list-style-type: none"> ■ ■ 	<ul style="list-style-type: none"> ■ ■
STN6A (off-site downstream)	General Chemistry (1) Metals		<ul style="list-style-type: none"> ■ ■ 	<ul style="list-style-type: none"> ■ ■

Notes:

- (1) General Chemistry includes pH, conductivity, free cyanide, total ammonia, COD, phenols, total phosphorus, TSS, chloride, dissolved sulphate
- (2) Consecutive day samples means one sample/day for 3 consecutive days

**Proposed Surface Water Monitoring Program
Lambton Facility, Clean Harbors**

Monitoring Location	Parameter (1)	Proposed Surface Water Sampling Program		
		Daily Discharge	Monthly Discharge	Spring and late Summer/Fall
EQ Pond Discharge	pH, conductivity, TSS, Total phenols, chloride, solvent extractables Microtox General Chemistry Metals VOCs sVOCs	■	■ (2) ■ (2) ■ (2) ■ (2) ■ (2)	
EQ Pond	Fish Presence		■	
West Storm Water Pond	General Chemistry Metals VOCs sVOCs		■ ■ ■ ■	
East Storm Water Pond	General Chemistry Metals VOCs sVOCs		■ ■ ■ ■	
STN6 (off-site background)	General Chemistry Metals			■ (3) ■ (3)
STN6A (off-site downstream)	General Chemistry Metals			■ (3) ■ (3)

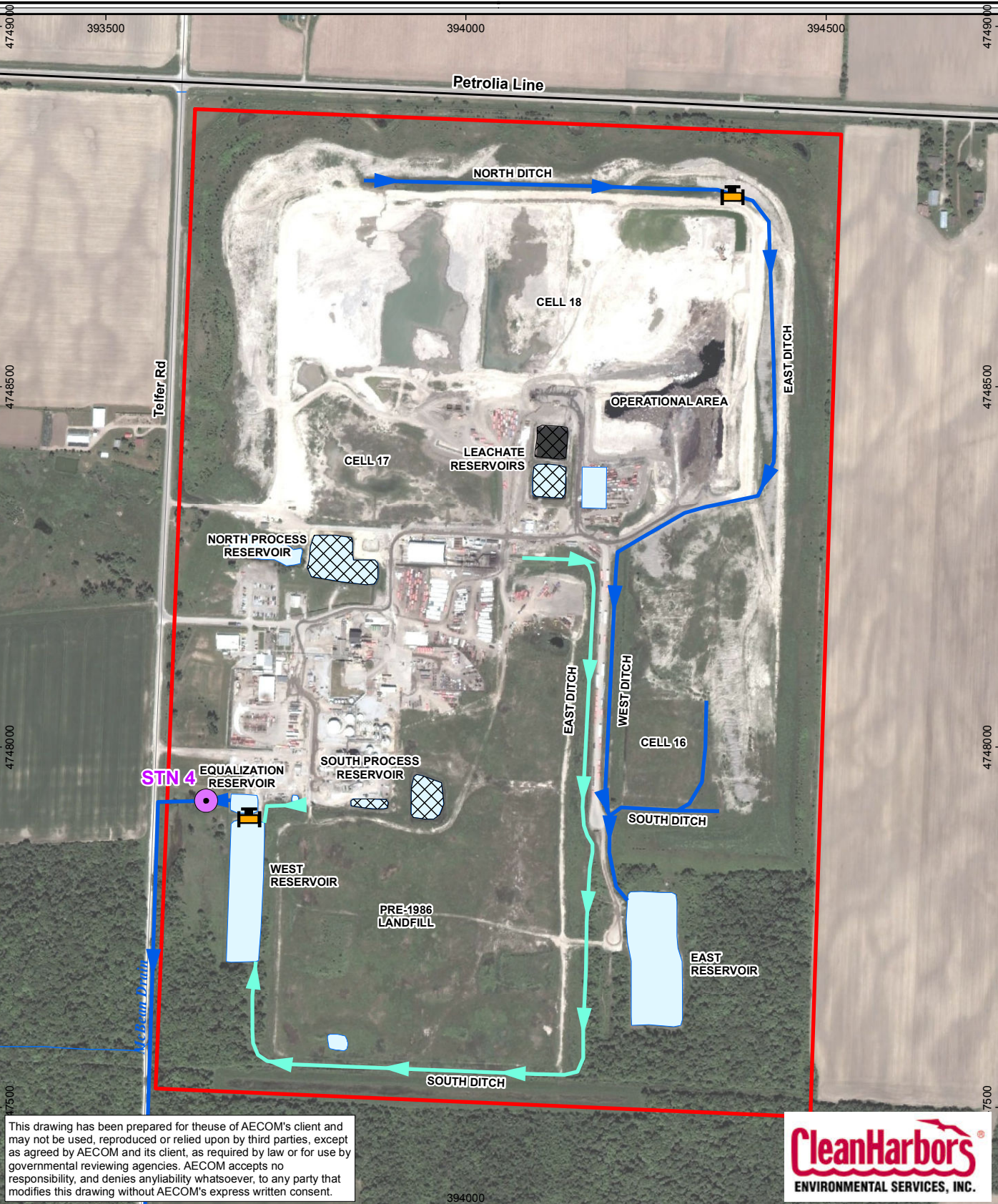
Notes:

- (1) General Chemistry, metals, VOC, and sVOC parameters as per detailed list provided in Table 3
- (2) Prior to discharge sample would be collected from the EQ Pond
- (3) Samples to be collected during discharge from Site and on same day as Monthly Discharge samples

**Surface Water Monitoring Parameters
Lambton Facility, Clean Harbors**

Parameter	Analytes
General Chemistry Parameters	Alkalinity (total as CaCO ₃), Ammonia-N, Bromide (dissolved), Chemical Oxygen Demand (COD), Chloride (dissolved), Conductivity (umhos/cm), Cyanide (total), Dissolved Organic Carbon (DOC), Fluoride, Hardness, Nitrate (as N), Nitrite (as N), pH (field), pH (lab), Phenolics (total), Phosphorus (total), Sulfate (dissolved), Temperature (field), Total Dissolved Solids (TDS), Total Kjeldahl Nitrogen (TKN), Total Suspended Solids (TSS), Un-ionized Ammonia
Metals (Total)	Aluminium, Antimony, Arsenic, Barium, Beryllium, Bismuth, Boron, Cadmium, Calcium, Chromium (Hexavalent), Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Strontium, Thallium, Tin, Vanadium, Zinc
Volatile Organic Compounds (VOC)	1,1,1,2-Tetrachloroethane, 1,1,1-Trichloroethane, 1,1,2,2-Tetrachloroethane, 1,1,2-Trichloroethane, 1,1-Dichloroethane, 1,1-Dichloroethene, 1,2-Dibromoethane (Ethylene dibromide), 1,2-Dichlorobenzene, 1,2-Dichloroethane, 1,2-Dichloropropane, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 2-Butanone (Methyl ethyl ketone), 4-Methyl-2-pentanone (Methyl isobutyl ketone), Acetone, Benzene, Bromodichloromethane, Bromoform, Bromomethane (Methyl bromide), Carbon tetrachloride, Chlorobenzene, Chloroethane, Chloroform (Trichloromethane), cis-1,2-Dichloroethene, cis-1,3-Dichloropropene, Dibromochloromethane, Dichlorodifluoromethane (CFC-12), Ethylbenzene, Hexane, m&p-Xylenes, Methyl tert butyl ether (MTBE), Methylene chloride, o-Xylene, Styrene, Tetrachloroethene, Toluene, trans-1,2-Dichloroethene, trans-1,3-Dichloropropene, Trichloroethene, Trichlorofluoromethane (CFC-11), Vinyl Chloride, Xylenes (total)
Semi-Volatile Organic Compounds (sVOC)	1,2,4-Trichlorobenzene, 1,2-Dichlorobenzene, 1,3-Dichlorobenzene, 1,4-Dichlorobenzene, 1-Methylnaphthalene, 2,3,4,5-Tetrachlorophenol/2,3,4,6-Tetrachlorophenol, 2,3,6-Trichlorophenol, 2,4,5-Trichlorophenol, 2,4,6-Trichlorophenol, 2,4-Dichlorophenol, 2,4-Dimethylphenol, 2,4-Dinitrophenol, 2,4-Dinitrotoluene, 2,6-Dinitrotoluene, 2-Chlorophenol, 2-Methylnaphthalene, 3,3'-Dichlorobenzidine, 4-Chloroaniline, Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene/Benzo(j)fluoranthene, Benzo(g,h,i)perylene, Benzo(k)fluoranthene, bis(2-Chloroethyl)ether, bis(ethylhexy)phthalate (DEHP), Chrysene, Dibenz(a,h)anthracene, Diethyl phthalate, Dimethyl phthalate, Fluoranthene, Fluorene, Hexachlorobenzene, Hexachlorobutadiene, Indeno(1,2,3-cd)pyrene, Naphthalene, Pentachlorophenol, Perylene, Phenanthrene, Pyrene

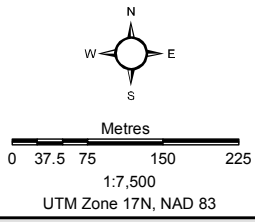
Attachment A



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Basemapping from Ontario Ministry of Natural Resources Orthophotography:



Legend

- | | |
|---------------------------------|----------------------------------------------|
| Water Quality Station | Non-Impacted/Treated Surface Water Reservoir |
| Pre-1986 Landfill Ditch System | Process Reservoir |
| Post-1986 Landfill Ditch System | Permanent Stream |
| Pumping Equipment | |

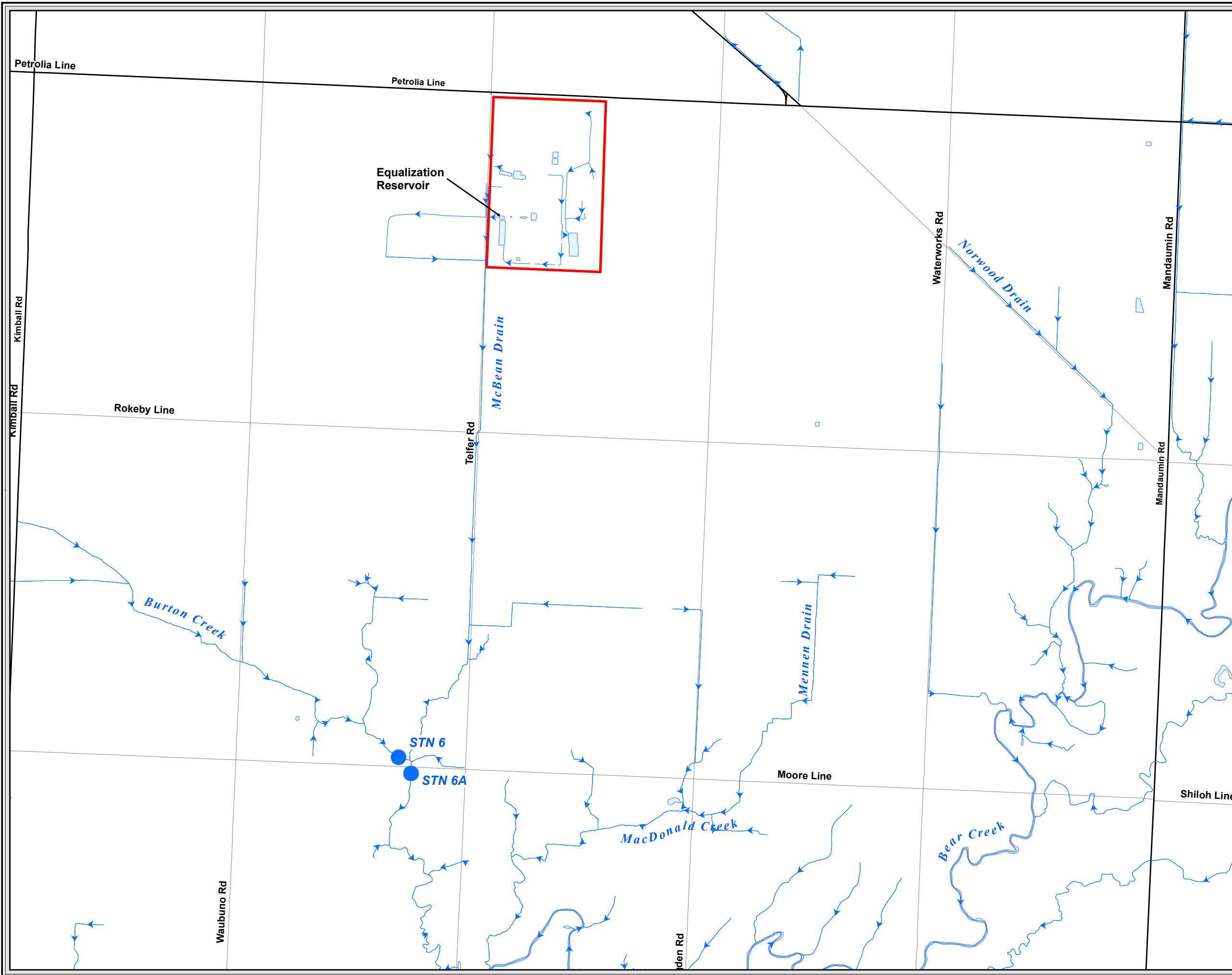
Clean Harbors, Lambton, Ontario

Surface Water Management System

October 2014
60316888



Figure 3



Legend

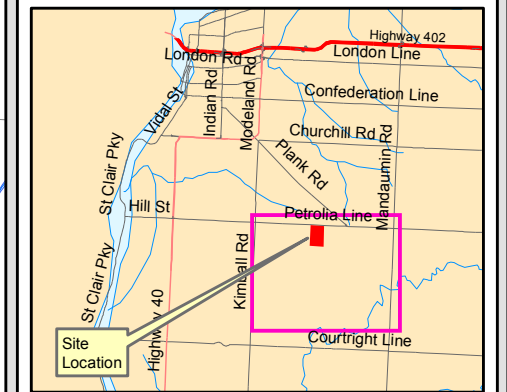
- Supplementary Off-Site Surface Water Monitoring Locations
- Waste Facility

Roads

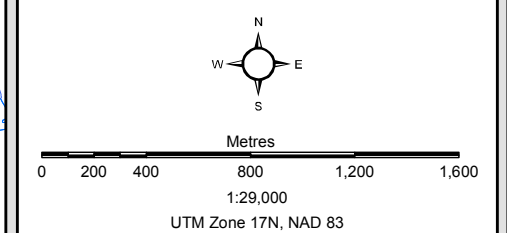
- Major Road
- Local Road

Water Features

- Intermittent Stream
- Permanent Stream
- Waterbody



Basemapping from Ontario Ministry of Natural Resources Orthophotography:



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CleanHarbors
Clean Harbors Canada, Inc.

Supplementary Off-Site Surface Water Monitoring Locations

October 2014
60316888

AECOM

Figure 4

Appendix B
Provincial Officer's Order No. 2681 BCPKUJ

Provincial Officer's Order

Environmental Protection Act, R.S.O. 1990, c. E.19 (EPA)
Ontario Water Resources Act, R.S.O. 1990, c. O.40 (OWRA)
Pesticides Act, R.S.O. 1990, c. P.11 (PA)
Safe Drinking Water Act, 2002, S.O. 2002, c.32 (SDWA)
Nutrient Management Act, 2002, S.O. 2002, c.4 (NMA)

Order Number
2681-BCPKUJ

Incident Report No.
5210-BAWQQ3

To: Clean Harbors Canada Inc.
4090 Telfer Rd
St. Clair, Ontario, N0N 1G0
Canada

Site: 4090 Telfer Rd
St. Clair, County of Lambton

Pursuant to my authority under OWRA Section 16.2, I order you to do the following:

Work Ordered

Item No. 1	Compliance Date	2019/06/06 (YYYY/MM/DD)
------------	-----------------	----------------------------

Upon service of this Order, implement the Updated Leachate Management Plan, in accordance with the timelines specified therein.

Item No. 2	Compliance Date	2019/11/01 (YYYY/MM/DD)
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By June 7, 2019, and continuing for the duration of this Order, submit to the Provincial Officer a written report every seven (7) days that includes, but is not limited to, the following:

- a description of all work related to the Updated Leachate Management Plan performed in the previous seven days;
- a description of any work to be carried out in relation to the Updated Leachate Management Plan during the next seven days; and
- a summary of all available sampling results taken in the previous seven days; and
- a description and rationale for any proposed change or modification to the Updated Leachate Management Plan.

Item No. 3	Compliance Date	2019/11/01
------------	-----------------	------------

(YYYY/MM/DD)

Upon service of this Order, no modifications, amendments or variation to the work described in the Updated Leachate Management Plan shall be implemented without prior written consent of the Provincial Officer.

Item No. 4

Compliance Date

2019/11/01

(YYYY/MM/DD)

Upon service of this Order, written notice shall be provided forthwith to the Provincial Officer upon receiving any sampling results from the Equalization Pond that indicate that any treatment system is not adequately managing leachate as described in the Updated Leachate Management Plan.

Item No. 5

Compliance Date

2019/11/01

(YYYY/MM/DD)

Upon service of this Order, copies of all documents, records and information required under this Order shall immediately be made available to the Provincial Officer or the District Manager upon request.

- A. While this Order is in effect, a copy or copies of this order shall be posted in a conspicuous place.
- B. While this Order is in effect, report in writing, to the District or Area office, any significant changes of operation, emission, ownership, tenancy or other legal status of the facility or operation.
- C. Unless otherwise specified, all requirements of this Order are effective upon service of this Order.

This Order is being issued for the reasons set out in the annexed Provincial Officers Report which forms part of this Order.

Issued at Sarnia this 5th day of June, 2019.



Maisa Fumagalli
Badge No:
Sarnia District Office
Tel: (519) 336-4743

REQUEST FOR REVIEW

You may request that this Order be reviewed by a Director.

Your request must be made (i) in writing (or if made orally, with written confirmation) and (ii) served on the Director at the address below within seven (7) calendar days after being served with a copy of this Order.

In the written request or written confirmation of an oral request, you must include:

- (a) the portions of the Order in respect of which the review is requested;
- (b) any submissions that you wish the Director to consider; and
- (c) an address for service to be used by the Director.

In response to your request for review, the Director may confirm, alter or revoke this Order and will serve you with a copy of the Director's decision or Order.

A request for review does not automatically stay this Order. If you wish to have the Director stay the Order you must also include this in your request and the Order is not stayed unless the Director makes an order granting a stay.

DEEMED CONFIRMATION OF THIS ORDER

If you do not receive oral or written notice of the Director's decision on your request for review within (7) calendar days of receipt of your request, and the Director has not stayed the Order, this Order shall be deemed to be confirmed by order of the Director and deemed to be served upon you.

In the case of a deemed confirmation, you may require a hearing before the Environmental Review Tribunal (Tribunal), if, within fifteen (15) calendar days from the deemed date of service of the Director's order, you serve written notice of your appeal on the Tribunal and the Director. Your notice must state:

- (a) the portion(s) of the Order in respect of which the hearing is required; and
- (b) the grounds on which you intend to rely at the hearing.

Except with leave of the Tribunal, you are not entitled to appeal a portion of the Order or to rely on a ground that is not stated in the notice requiring the hearing. Unless stayed by the Tribunal, the Order remains in effect from the date of service.

Written notice requiring a hearing can be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 326-5370
Email: ERTTribunalsecretary@ontario.ca

and

Director
Ministry of the Environment, Conservation and Parks
Sarnia District Office
1094 London Rd
Sarnia ON N7S 1P1
Fax: (519) 336-4280
Tel: (519)336-4030

Further information on the Tribunal and requirements for an appeal can be obtained directly from the Tribunal by:

Tel: (416) 212-6349 or 1(866) 448-2248
TTY 1-800-855-1155 via Bell Relay

Fax: (416) 326-5370 or 1(844) 213-3474
Web: www.ert.gov.on.ca

FOR YOUR INFORMATION

The following is for your information:

Service of the documentation referred to above can be made personally, by mail, by fax, by commercial courier or by email in accordance with the legislation under which the Order is made and any corresponding Service Regulation. Further information can be obtained from e-Laws at www.e-laws.gov.on.ca. Please note that choosing service by mail does not extend any of the above mentioned timelines.

Unless stayed, this Order is effective from the date of service. Non-compliance with the requirements of this Order constitutes an offence.

The requirements of this Order are minimum requirements only and do not relieve you from complying with the following:

- (a) any applicable federal legislation,
- (b) any applicable provincial legislation or requirements that are not addressed in this Order, and
- (c) any applicable municipal law.

The requirements of this Order are severable. If any requirement of this Order or the application of any requirement to any circumstances is held invalid, the application of such requirement to other circumstances and the remainder of the Order are not affected.

Further orders may be issued in accordance with the legislation as circumstances require.

The procedures and other information provided above are intended as a guide. The legislation and/or regulations should be consulted for additional details and accurate reference.



Clean Harbors - Consolidated Management Plan (June 4, 2019).pdf

Provincial Officer's Report

Order Number
2681-BCPKUJ

Clean Harbors Canada Inc.
4090 Telfer Rd
St. Clair, Ontario, N0N 1G0
Canada

Site
4090 Telfer Rd
St. Clair, County of Lambton

Observations

PROVINCIAL OFFICER'S REPORT

1. Authority to Issue Order

I have authority as a provincial officer to issue Orders under the EPA to further the purpose of the EPA, namely, to provide for the protection and conservation of the natural environment. I also have authority as a provincial officer to issue Orders under the OWRA, to further the purpose of the OWRA, namely, to provide for the conservation, protection and management of Ontario's waters.

2. Definitions

For the purposes of this Order, the following terms shall have the meanings described below:

“Adverse effect” has the same meaning as in the EPA.

“Company” means Clean Harbors Canada, Inc.

“Design and Operations Report” means the report entitled “Revised Design and Operations Report – Lambton Landfill Expansion, Clean Harbors Canada Inc.” authored by Tetra Tech and

dated October 8, 2015. This report is included as Item 26 of Schedule A of Landfill ECA Amendment No. 9, issued October 19, 2015.

“ECA” means an Environmental Compliance Approval (formerly known as a Certificate of Approval) issued under Part II.1 of the EPA.

“EPA” means the Environmental Protection Act, R.S.O. 1990, c. E 19, as amended.

“Equalization Pond” refers to the Equalization Pond that is part of the Surface Water System and has the same meaning as that term is described in the Sewage Works ECA.

“Fractionalization Tank” or “Frac Tank” means a fractionalization tank brought to the Site to temporarily store leachate or leachate contaminated water; or water from the south ditch for batch treatment.

“Incinerator ECA” means Amended ECA No. 8-1030-94-006 issued April 19, 1994, and includes the Operating Manual referenced in Condition 11, as required by section 9 of the EPA.

“Landfill” means the waste disposal site authorized in Amended Environmental Compliance Approval No. A031806, dated September 5, 1997 and last amended September 22, 2017, including the landfill pre-treatment system and temporary storage and transfer activities as described therein.

“Landfill ECA” means Amended ECA No. A031806 issued September 5, 1997 and last amended September 22, 2017, as required by section 27 of the EPA.

"LDR" means Land Disposal Restrictions and has the same meaning as in the Landfill ECA.

“LDR Storage Report” means the weekly report required by Condition 23v of the Landfill ECA.

“Leachate Collection System” means all components and equipment for the collection and management of leachate approved under the Landfill ECA.

“Leachate Pond Cover ECA” means ECA No. 2005-8RHJL6 issued February 27, 2012, as required by section 53 of the OWRA.

“Maintenance Yard” means the yard area immediately outside the Vehicle Maintenance Building.

“Ministry” or “MECP” means the Ontario Ministry of the Environment, Conservation and Parks.

“Mobile Sewage ECA” means ECA No. 2423-B6CN2D issued December 19, 2018, as required by section 53 of the OWRA.

“Mobile Treatment Unit” means the mobile sewage works and related equipment approved under

the Mobile Sewage ECA.

“Order” means this Provincial Officer’s Order Number No. 2681-BCPKUJ, as may be amended, or 8210-BBCPS2.

“Provincial Officer” means the undersigned Provincial Officer, or in the event the undersigned person is unable to act, any other provincial officer with the MECP Sarnia District Office authorized to act under the EPA and OWRA. Any document that is required to be submitted to the Provincial Officer under this Order shall be sent to the attention of Maisa Fumagalli, either via email to Maisa.Fumagalli@ontario.ca or via mail to the MECP Sarnia District Office, 1094 London Road, Sarnia ON N7S 1P1.

“Provincial Officer’s Report” means this Provincial Officer’s Report, which comprises part of this Order.

“Regulation 347” means General – Waste Management, R.R.O. 1990, Regulation 347 under the EPA.

“Sewage Works ECA” means Amended ECA No. 1065-9VVJSW, issued October 19, 2015, as required by section 53 of the OWRA.

“Site” means the property legally described as Part of Lots 8 and 9, Concession 10, and Part of Lots 8 and 9, Concession 9, formerly Township of Moore and now part of Township of St. Clair, County of Lambton, Ontario and being all of PINS 43293-0053, 43293-0055, 43293-0056, 43293-0065 and 43293-0066; and municipally known as 4090 Telfer Road, Rural Route No. 1, Corunna, St. Clair Township, County of Lambton, Ontario N0N 1G0.

“South Ditch” means the Waste Dump Ditch and the Southwest Perimeter Ditch as those terms are described in the Sewage Works ECA, both of which are part of the Surface Water System.

“Surface Water System” means the contact stormwater collection, management, and treatment system approved in the Sewage Works ECA, and includes the Waste Dump Ditch, Southwest Perimeter Ditch, West Pond, East Pond, Equalization Pond, and Wastewater Treatment Plant as those terms are described in the Sewage Works ECA.

“Tribunal” means the Environmental Review Tribunal.

“Updated Leachate Management Plan” means the document entitled “Clean Harbors South Ditch, Water and Leachate Management Plan,” originally dated May 23, 2019, amended on June 4, 2019; and prepared by Clean Harbors; a copy of the most recent Plan is attached to this Order as Schedule “A”.

3. Site Description

Site Description

The Company owns and operates an integrated hazardous waste management facility site consisting of a secure landfill and a liquid waste incinerator. Waste disposal operations have been carried out at the Site since the early 1960s under a series of successive owners. The Company acquired the Site in 2002.

The land adjacent to the Site is primarily used for agriculture. The Site's north drainage outlet drains to Perch Creek, which in turn drains to Lake Huron. The south drainage outlet drains to Bear Creek, which in turn drains to the Sydenham River and Lake St. Clair. The natural environment at and surrounding the Site includes fish and amphibian habitat, and woodlots which provide habitat for wildlife.

Surface Water Management

The Sewage Works ECA authorizes an industrial sewage works for the collection, treatment and disposal of contact stormwater, process wastewater, and sanitary sewage from the Site. The works consists of the Surface Water System, a non-contact stormwater management system, a process wastewater treatment system, and a sanitary sewage system.

The Surface Water System includes the Waste Dump Ditch, Southwest Perimeter Ditch, West Pond, East Pond, Equalization Pond, and Wastewater Treatment Plant all as described in the Sewage Works ECA.

The Surface Water System discharges offsite from the Equalization Pond through an outlet into the Telfer Side Road ditch. The ditch drains into the watercourse Bear Creek, which then drains into Sydenham River and Lake St. Clair.

Leachate Management

The existing Leachate Collection System (LCS) is authorized by the Landfill ECA. Pursuant to the Landfill ECA, leachate is captured in a perimeter leachate collection trench. Sumps equipped with pumps transfer leachate collected in the perimeter trench via a forcemain to a leachate pumping station and central storage unit. The leachate pumping station in turn pumps the accumulated leachate to an above ground storage tank and three leachate storage ponds.

The three ponds are covered with floating membranes that can be vented pursuant to the Leachate Pond Cover ECA. Discharge from the vents is sent to a scrubber to remove harmful compounds, followed by an activated carbon bed for treatment. The treated discharge from the carbon bed exhausts into the atmosphere through a stack.

Leachate is transferred from the active disposal areas to the leachate ponds primarily by pumping through an underground pipeline. Leachate is transferred from the covered ponds to an incinerator for disposal through an underground pipeline.

4. Events Leading to the Provincial Officer's Order

I have been the assigned Environmental Officer for Clean Harbors since May 2019. Provincial Officer Don Hayes was previously assigned to conduct inspections of the Site and reported weather and other conditions that resulted in the generation of hazardous waste leachate at a rate of approximately 35 liters per minute. The Site's incinerator is currently able to incinerate leachate generated by the landfill at a rate of 20 to 30 liters per minute. Since 2015, the rate of leachate generation at the Site has outpaced the rate at which it could be disposed of. These conditions have led to the Site's leachate storage ponds nearing maximum storage capacity.

On April 4, 2019 the Company reported that a seep from the Leachate Collection System was allowing landfill leachate to enter the Surface Water System. On April 5, 2019, the Company reported that the leachate levels within the Leachate Collection System perimeter trench were measured at 201.3 meters above sea level ("mASL"). In accordance with the Design and Operations Report, the maximum leachate level for the Leachate Collection System is 196 mASL. The presence of leachate exceeding 196 mASL results in a risk that the leachate will be discharged to the natural environment.

The Landfill ECA allows for a total leachate storage capacity at the Site of 41,159,610 litres, comprised of specifically approved storage containers. As of March 31, 2019, Officer Hayes notes that the Ministry was aware that the Site's leachate storage contained well over 90% of its approved storage capacity. On May 2, 2019, a meeting was held at the Site and attended by six Ministry officials, including myself and representatives for the Company. Officer Hayes noted that the Company's consultant, Jim Yardley, reported that the Leachate Collection System was not being operated in accordance with the Design and Operations Report. The notes continue that an additional 4 to 5 million litres of previously unreported leachate is currently being stored within the Leachate Collection System. This additional leachate is the reason that the leachate level within the system was measured to be 201.3 mASL in April 2019.

Pursuant to Regulation 347, landfill leachate is a designated hazardous waste. Officer Hayes reports that the Ministry has conducted sampling of the leachate from the Site which indicated that the leachate contains high levels of volatile organic compounds, hydrogen sulphides, and other harmful chemicals. Seepage of the leachate into the Surface Water System may result in the discharge of material onsite and potentially offsite, that may impair the quality of water.

In addition, the Equalization Pond and West Pond that make up part of the Surface Water System contain aquatic organisms including fish. Currently, there is no evidence of any adverse impacts to aquatic organisms, however, the risk of impairment exists if leachate continues to seep into the Surface Water System.

To prevent leachate seeps from the Leachate Collection System into the Surface Water System, the leachate levels within the Leachate Collection System must be lowered, as required under the Company's approvals. To prevent or reduce the risk of a discharge from the Leachate Collection System to the natural environment, additional temporary leachate storage is needed at the Site.

One significant leachate seep had been identified and was contaminating a portion of the Surface Water System along the South Ditch and flowing into the West Pond. Under Order No.

8210-BBCPS2, the seep was isolated with berms, the water within it was pumped to the Leachate Control System, and the section was filled with clay on May 14, 2019. On May 14, 2019, I attended the site and the Company advised of potential minor seepage into the rest of the South Ditch. It is necessary to ensure the South Ditch is not connected to, nor receiving leachate from the Leachate Control System and any newly identified seeps must be dealt with swiftly to prevent impairment to the natural environment.

The East Pond normally conveys water through the South Ditch into the West Pond prior to reaching the Equalization Pond and discharged to the Telfer Side Road ditch. To prevent or reduce the risk of further surface water from being contaminated by leachate, it is necessary for the surface water from the East Pond to be directed to the Equalization Pond in a manner that will bypass the location of the seepage and ensure the contaminated area is isolated.

On April 10, 2019, the Company submitted the an abatement plan to the Ministry, which contained a proposal intended to address the seep from the Leachate Collection System to the Surface Water System. On May 7, 2019, the Company submitted the Surface Water Management Strategy, which was an updated abatement plan intended to further address the seep from the Leachate Collection System to the Surface Water System.

On May 23, 2019, the Company submitted the Updated Leachate Management Plan, which consolidates and further updates the previous leachate abatement plans. The Updated Leachate Management Plan forms the basis for this Order, and takes precedence over any previously discussed work or arrangements between the Ministry and the Company, including but not limited to any of the work described above. In the event of a conflict between the requirements of this Order and the Updated Leachate Management Plan, the requirements of the Order take precedence and prevail to the extent of any conflict.

In addition, the Company has been advised on April 18, 2019, May 3, 2019, and May 21, 2019 that carrying out the work further to the discussions between the Ministry and the Company did not and does not exempt the Company from any applicable legal requirements.

5. Legal Authority and Reasons

This Order is issued pursuant to sections 157.1, and 196 of the EPA and sections 16.1, 16.2 and 104 of the OWRA.

I reasonably believe the requirements of the Order are necessary or advisable to prevent or reduce the risk of a discharge of a contaminant, namely landfill leachate, into the natural environment from the undertaking or the property, or to prevent, decrease or eliminate an adverse effect, namely impairment of the quality of the natural environment for any use that may be made of it, and/or injury or damage to animal or plant life, that may result from (i) the discharge of the contaminant from the undertaking, or (ii) the presence or discharge of the contaminant in, on or under the property.

I reasonably believe that the requirements of this Order are generally in the public interest, and

necessary to prevent a discharge of material, namely landfill leachate, into Bear Creek that may impair the quality of water.

8. Attachments

The attachments listed below form a part of this Provincial Officer's Report:

1. Schedule "A" - Updated Leachate Management Plan

Offence(s)

Suspected Violation(s)/Offence(s):	
Act - Regulation - Section, Description {General Offence}	



Maisa Fumagalli
Provincial Officer
Badge Number:
Date: 2019/06/05
District Office: Sarnia District Office



June 4, 2019

Clean Harbors South Ditch, Water and Leachate Management Plan

1. Introduction

The following is a consolidated remedial work program to address the seepage of leachate at several locations along the South Ditch at the Clean Harbors Lambton Landfill. The work program addresses items that have been impacted by the seep either directly or indirectly by the leachate seeps and the removal of the South Ditch from the sites stormwater management system. The work program addresses surface water management, South Ditch remediation, leachate management, sampling plan, contingency plans, and reporting.

2. Surface Water Management

2.1 East Retention Pond Surface Water Management

The East Retention Pond water normally discharges to the West Retention Pond via the South Ditch. The construction of berms, B2 and B7, located at the east and west end of the South Ditch were installed to contain the water in the ditch and isolated the East Retention Pond from transfer to the West Retention Pond for surface water treatment and discharge.

Analytical results from the East Retention Pond and East Ditch showed that the surface water was not impacted by the leachate seeps.

The current approach for surface water management for the East Retention Pond includes the following:

- Water from East Retention Pond is treated by a mobile carbon filtration system
- Following water treatment with the mobile carbon filtration system, the effluent water is piped overland to the Equalization Pond (EQ Pond). The temporary pipe system extends south to the security fence, west along the security fence, and then along the western limit of the West Retention Pond to the discharge point at the Equalization Pond.
- Water within the EQ Pond is sampled for ECA compliance parameters and additional for volatile organic compounds (VOCs) daily during discharge events to Telfer Road ditch.

2.2 West Retention Pond Surface Water Management

The West Retention Pond is the final surface water retention pond with all surface water from the site stored in this pond for treatment and discharge. The surface water quality in the West Retention Pond indicated a minor impact due to the leachate seepage event and as such the Site's Surface Water Treatment Plant (SWTP) was turned off and the west ditch inlet to the pond was bermed off through the construction of berm B1. The most recent water testing (April 30th) for the West Retention Pond indicated

that the primary VOC parameter detected, acetone, was 59 ug/L. Due to rain events, the West Retention Pond has back-flowed into the west ditch (over flowed berm B1).

The SWTP retrofit, which included new activated carbon and some minor repairs to the distribution pipes in the carbon filter unit, was completed on May 22, 2019. The amount and type of carbon are in accordance with the ECA approval for the facility.

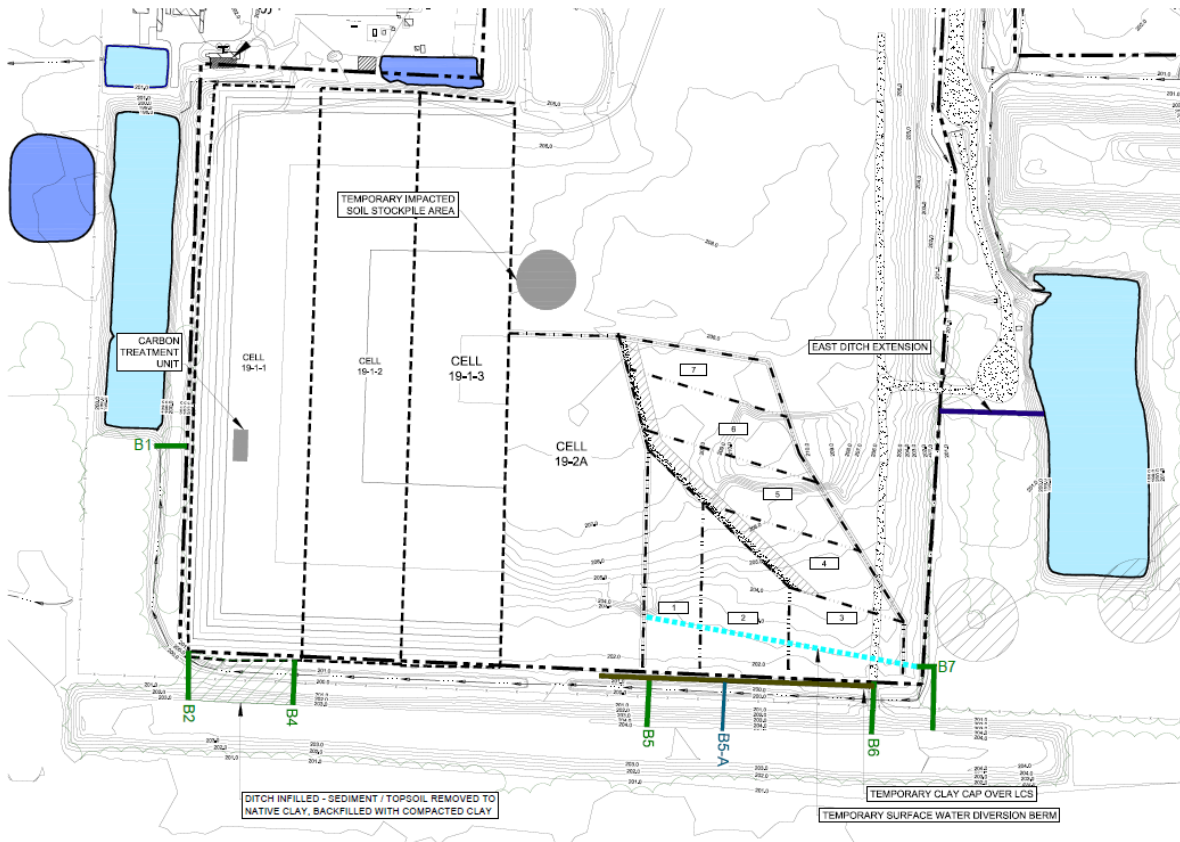
The sand filter has been backwashed for a minimum of two hours (normally requires routine backwash for 15 to 20 minutes to remove sediment from the filter). The SWTP is now ready for return to service. As per normal protocol, the SWTP will be operated in recirculation mode until test samples confirm that the unit is operating within the ECA compliance parameters.

When the SWTP testing has concluded that the SWTP is operating within compliance requirements, the surface water management for the Site will consist of the following:

- Water from the West Retention Pond will be treated by the on-Site SWTP and discharged to the EQ Pond
- The mobile treatment system that is currently treating the East Retention Pond water will be removed and the temporary piping system will be adjusted to extend from the East Retention Pond pumphouse to the south end of the West Retention Pond
- Water within the EQ Pond will be sampled for ECA compliance parameters and VOCs daily during discharge to Telfer Road. Section 5 provides additional details with regards to sample locations, schedule, and completion period.

2.3 South Ditch Water Management

The South Ditch has been separated with a series of berms to contain the impacted surface water. In addition, temporary diversion berms have been installed to redirect overland surface water flow from the South Ditch and the east ditch has been connected to the East Retention Pond. The following figure provides an overview of the key remedial works that have been or are currently being installed at the Site and provides a base for the remedial work plan.



The portion of the South Ditch from Berm B2 to B4 has been remediated at this time in accordance with procedure outline in later sections. This remediated section drains to the west ditch.

2.3.1 Water Treatment

2.3.1.1 Water Treatment Pilot Testing

A pilot test for treating the surface water within the South Ditch was conducted, which involved treating 200,000 L of water from the South Ditch with a mobile carbon filtration system. The mobile carbon filtration system includes a bag filter to remove sediment and two activated carbon filters operated in series. The pilot test was conducted from water that was located between B4 and B6 and the intake was close to B4. The water tested is considered representative of water that is located within the South Ditch.

The pilot test treatment successfully treated the water to reduce the primary VOC detected, acetone, to non-detect levels. The following table provides the influent and effluent test results for the pilot test program. The treated water was returned to the South Ditch following treatment. Based on the pilot test results, the mobile treatment system has demonstrated that it is capable to treat the South Ditch water to VOC levels that are below the Provincial Water Quality Objectives (PWQO).

Appendix A has VOC analytical results from May 17th that indicate the VOC levels have significantly reduced since May 7th. With the reduced VOC levels in the South Ditch area B4 to B6 the carbon treatment systems should have no problem with treating the ditch water to acceptable discharge standards.

Client Sample ID			SOUTH DITCH BEFORE CARBON (BC)	SOUTH DITCH AFTER CARBON (AC)	Client Sample ID			SOUTH DITCH BEFORE CARBON (BC)	SOUTH DITCH AFTER CARBON (AC)
Date Sampled			7-May-2019	7-May-2019	Date Sampled			7-May-2019	7-May-2019
Time Sampled			13:15	13:15	Time Sampled			13:15	13:15
ALS Sample ID			L2268948-1	L2268948-2	ALS Sample ID			L2268948-1	L2268948-2
Parameter	Lowest Detection Limit	Units	Water	Water	Parameter	Lowest Detection Limit	Units	Water	Water
Volatile Organic Compounds (Water)									
Acetone	20	ug/L	7530	<20	Dichloromethane	2.0	ug/L	18.7	<2.0
Benzene	0.50	ug/L	1.02	<0.50	1,2-Dichloropropane	0.50	ug/L	<0.50	<0.50
Bromodichloromethane	1.0	ug/L	<1.0	<1.0	cis-1,3-Dichloropropene	0.50	ug/L	<0.50	<0.50
Bromoform	1.0	ug/L	<1.0	<1.0	trans-1,3-Dichloropropene	0.50	ug/L	<0.50	<0.50
Bromomethane	0.50	ug/L	<0.50	<0.50	Ethylbenzene	0.50	ug/L	3.89	<0.50
Carbon Disulfide	1.0	ug/L	2.2	<1.0	n-Hexane	0.50	ug/L	<0.50	<0.50
Carbon tetrachloride	0.50	ug/L	<0.50	<0.50	2-Hexanone	20	ug/L	<20	<20
Chlorobenzene	0.50	ug/L	<0.50	<0.50	Methyl Ethyl Ketone	20	ug/L	2540	<20
Dibromochloromethane	1.0	ug/L	<1.0	<1.0	Methyl Isobutyl Ketone	20	ug/L	<500	<20
Chloroethane	1.0	ug/L	<1.0	<1.0	MTBE	0.50	ug/L	22.9	<0.50
Chloroform	1.0	ug/L	<1.0	<1.0	Styrene	0.50	ug/L	0.81	<0.50
Chloromethane	1.0	ug/L	<1.0	<1.0	1,1,1,2-Tetrachloroethane	0.50	ug/L	<0.50	<0.50
1,2-Dibromoethane	0.20	ug/L	<0.20	<0.20	1,1,2,2-Tetrachloroethane	0.50	ug/L	<0.50	<0.50
1,2-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	Tetrachloroethylene	0.50	ug/L	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	Toluene	0.50	ug/L	54.9	<0.50
1,4-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	1,1,1-Trichloroethane	0.50	ug/L	<0.50	<0.50
Dichlorodifluoromethane	1.0	ug/L	<1.0	<1.0	1,1,2-Trichloroethane	0.50	ug/L	<0.50	<0.50
1,1-Dichloroethane	0.50	ug/L	<0.50	<0.50	Trichloroethylene	0.50	ug/L	9.49	<0.50
1,2-Dichloroethane	0.50	ug/L	0.91	<0.50	Trichlorofluoromethane	1.0	ug/L	<1.0	<1.0
1,1-Dichloroethylene	0.50	ug/L	<0.50	<0.50	Vinyl chloride	0.50	ug/L	<0.50	<0.50
cis-1,2-Dichloroethylene	0.50	ug/L	39.9	<0.50	o-Xylene	0.50	ug/L	12.1	<0.50
trans-1,2-Dichloroethylene	0.50	ug/L	<0.50	<0.50	m+p-Xylenes	1.0	ug/L	19.5	<1.0
					Xylenes (Total)	1.1	ug/L	31.6	<1.1

2.3.1.2 Proposed Water Treatment for the South Ditch

Water from the South Ditch is proposed for treatment using a mobile carbon filtration system with the same configuration as the pilot test program. The proposed approach for water treatment includes the following:

- The mobile carbon filtration system will be installed on Cell 19-1.
- Initially, ten (10) frac tanks will be installed on Cell 19-1 to temporarily receive the treated water for confirmation testing. At Clean Harbors discretion, an additional ten (10) frac tanks (20 in total) may be used as temporary treated water storage on Cell 19-1. The additional frac tanks will be used to optimize the volume of treated water.
- Water from between berms B4 to B5 will be pumped directly into the mobile carbon filtration system. The effluent from the mobile carbon filtration system will be discharged to the frac tanks for confirmation testing.
- Water will be treated in batches and will be stored in 5 frac tanks per batch (the batch volume will depend on the frac tanks available). In general, a treated batch will represent approximately 450,000 L.
- Samples will be collected from the influent and effluent water from the mobile carbon filtration system during the final stage of filling the fifth and final frac tank of each batch. The effluent samples will be tested for VOC parameters. The influent sample will be held pending the effluent results. If the effluent results are acceptable, the influent sample will be disposed of. If the effluent result is unacceptable, the influent sample that was held will be analyzed by the laboratory. Pending the results, Clean Harbor may sample the individual frac tanks to assess treatment performance and discharge acceptability.
- Effluent water will be stored in the 5 frac tanks until analytical results are obtained.
 - If the results indicate adequate treatment to concentrations lower than the VOC PWQOs (including 280 ug/L for acetone), the frac tanks will be discharged via overland hose/pipe to the West Retention Pond.
 - If the results indicate elevated concentrations still exist above the PWQO, the effluent water stored in the frac tanks will be redirected for re-treatment.
 - Additionally, the influent sample will be analyzed, the mobile carbon filtration system will be assessed for carbon breakthrough.
- The treatment operation will be managed in a manner to allow continuous treatment of the South Ditch water, i.e. the next five frac tanks will be filled with treated water while testing from the previous batch is occurring.

Ten frac tanks, to a maximum of 20 frac tanks, will be used to store effluent water. This will allow for treating multiple batches while waiting for analytical results. The use of frac tanks for effluent storage may be increased to 20 based on operational capability.

Carbon in the mobile treatment system will be replaced as required based on testing. The mobile treatment plant that is currently treating the East Retention Pond water will provide a back-up treatment system for the South Ditch water during carbon change out or will be used to provide additional treatment by running the two plants in parallel.

In the event the two carbon treatment systems are run in parallel each system would complete their own separate batching and sampling program.

Water from berm B5 to B6 of the ditch will be transferred to berm B4 to B5 area as required by the South Ditch remediation.

3. South Ditch Remediation

The South Ditch will be remediated in sections based on the existing berms. Sections may be subdivided further based on the size that can be effectively managed and based on observations during the work and site conditions. The work program to infill the South Ditch has commenced and the section between B2 and B4 has been infilled through the procedures presented herein. The South Ditch will be remediated in four major sections.

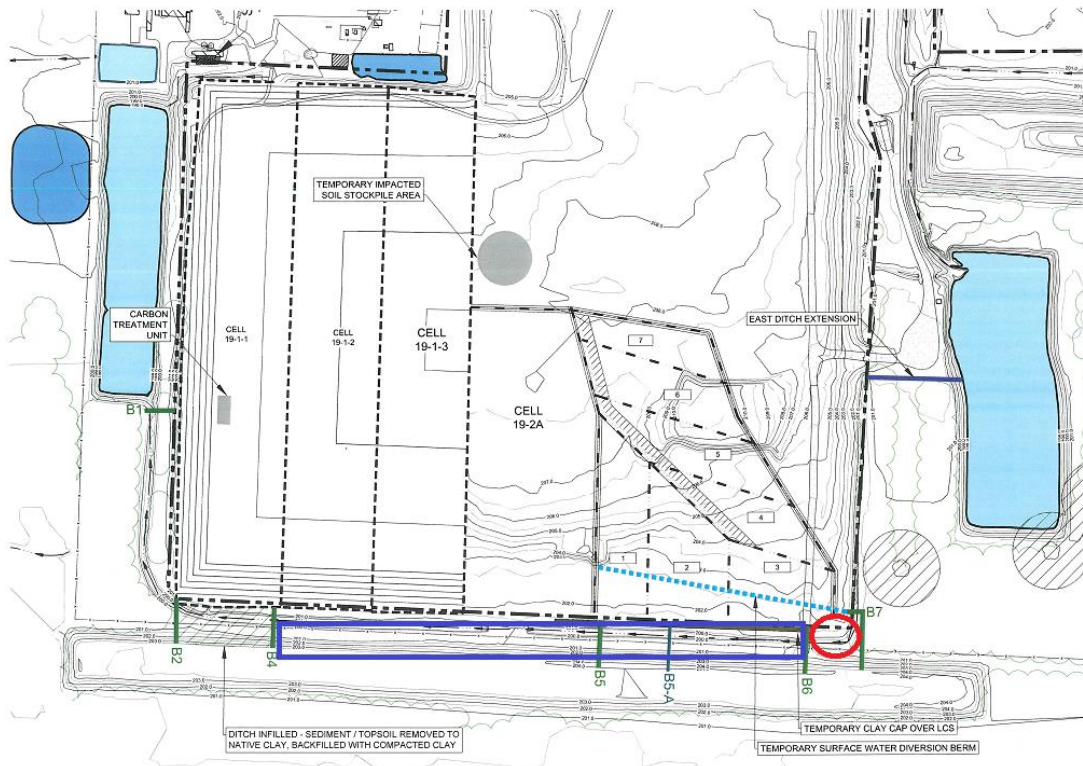
3.1 Between berm B6-B7:

Berms B6-B7 are located at the southeast corner of the South Ditch. Water from between B6-B7 will be managed separately from other portions of South Ditch due to a leachate seep in the bank.

Water was pumped from this area into the LCS via the southeast cleanout. Sump 4 was operated to lower the leachate level within southeast area of LCS by transfer of the leachate to the leachate holding tank located prior to incineration.

The area has been temporarily remediated by installing a temporary clay plug in the area. Clay was stockpiled on the south side of ditch. As the water level was lowered within ditch, clay was placed within ditch and compacted.

Once the LCS is operating with the normal operational range (196 to 197 mASL), the temporary clay plug will be removed, along with any sediment/vegetation/root growth zone, and the excavation filled with compacted clay. The method of final infill will be based on the experience and lessons learned during the infill of B2 to B6.



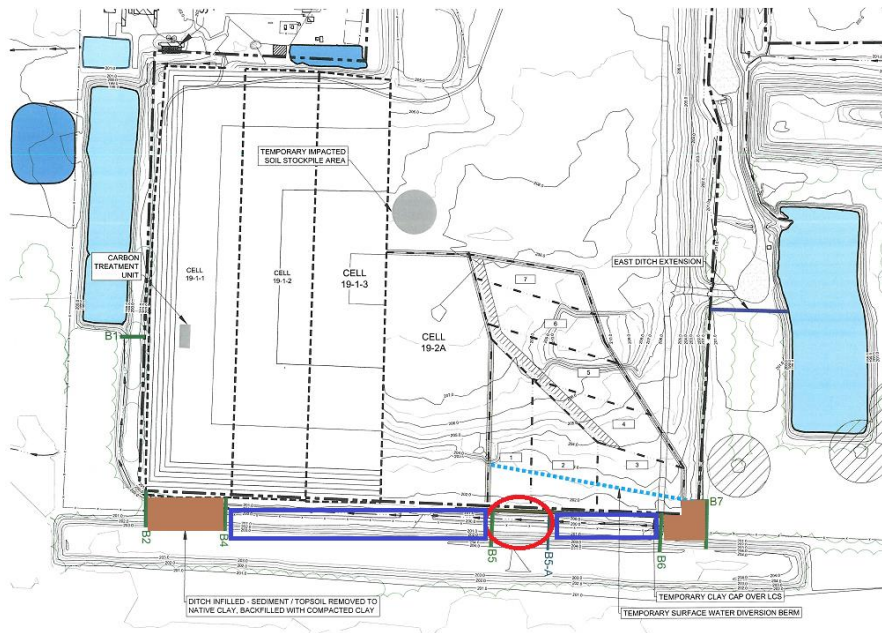
3.2 Between berms B5-B6:

The area between berms B5-B6 represents the section of the east ditch that located adjacent to the LCS that does not contain the landfill perimeter berm above the LCS. Minor leachate seepage/staining was visually noted directly above the LCS when the LCS was at the peak hydraulic pressure. Currently, there are no visual observations of leachate seeps within this area. It is anticipated the risk for potential leachate seepage during remediation is low if the LCS hydraulic pressure is managed. Currently water from the South Ditch has flooded the vertical projection of the LCS trench.

Berm B5A has been constructed to provide the initial remediation zone for the B5 to B6 area. The remediation for the area will consist of the following:

- Water from Berm 5 to 5A will be pumped to berm B4 to B5
- Temporary berm above the LCS has been constructed for the section and will be installed along the complete B5 to B6 section.
- The excavation and clay placement will be conducted in a manner to ensure that at the end of the work day the bulk of the excavated area has been backfilled with compacted clay to above the LCS level (approximately 201 mASL). The overall section will take several days to complete the excavation and infill work.
- After water removal, the area will be excavated to remove the sediment, vegetation, and root growth zone for the daily work area. The excavation will extend to the native undisturbed clay. The excavated material will be trucked to the disposal area north of Cell 19-2A and shown on the following plan.
- Clay (free of vegetation and roots) from the South Berm will be will be excavated and trucked to the area, placed and compacted.
- During remediation activities, the LCS will be pumped in accordance with the leachate management plan (Section 4)

The section between berms B5A and B6 will be remediated as per berm B5 and B5A. Depending on site conditions and water level, a temporary berm(s) may or may not be installed to create a manageable work area. Any lessons learned will be incorporated into the infilling of the next section. The following figure provides the B5 to B6 zone for reference.

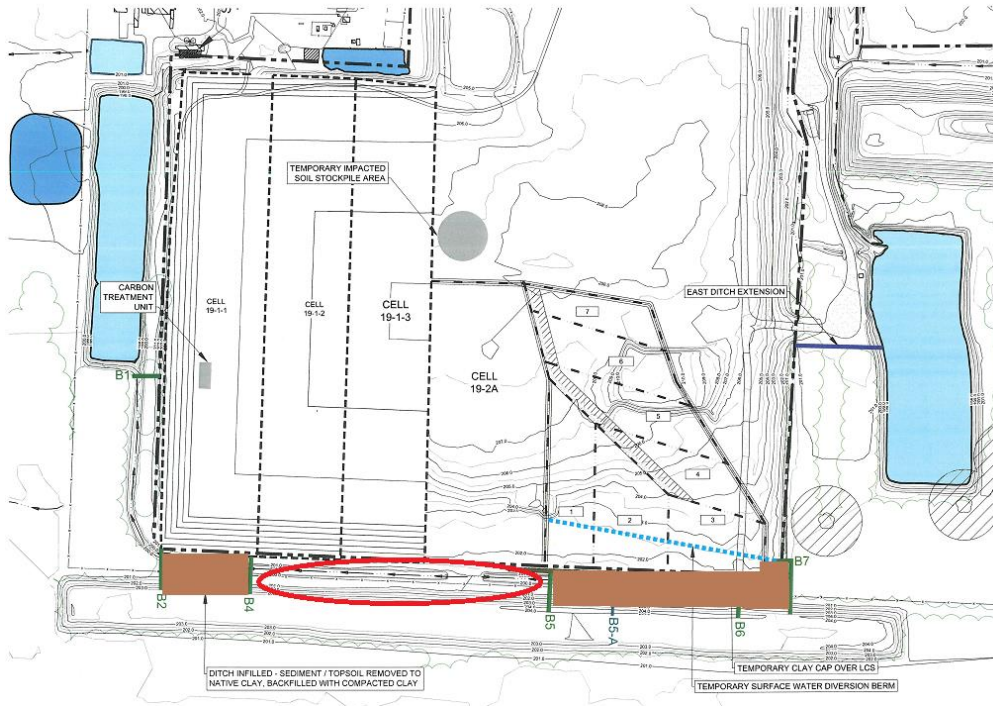


3.3 Between berms B4-B5:

Berms B4-B5 are located in the area that has the perimeter berm constructed above the LCS and is currently landfilled or currently being landfilled. No leachate seeps have been observed within this area. This area is proposed to be used to store water prior to treatment due to its current status and that an increased water level in this section will have minimal inflow to the LCS if the South Ditch water elevation is higher than the LCS leachate elevation.

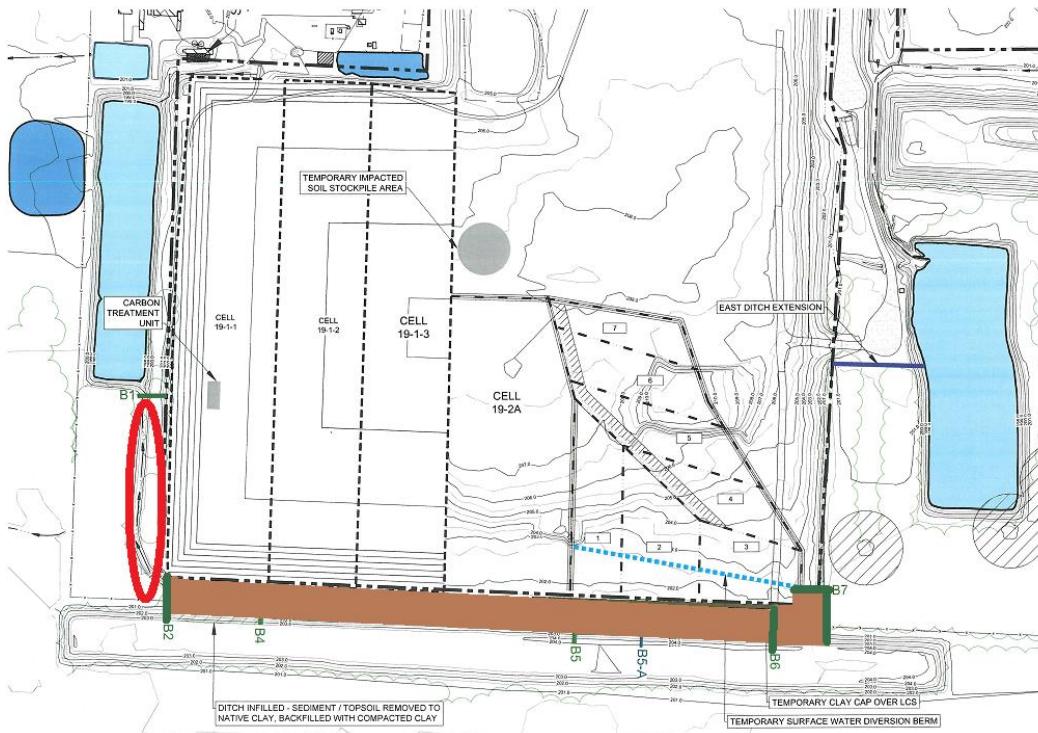
Water from between B4-B5 will be pumped to the mobile carbon filtration system. The water located in the B4-B5 area will be the source water for the temporary water treatment plant. Remediation and infilling of the ditch between berms B4-B5 will occur after remediation is complete between berms B5-B6.

The remediation of the area between berms B4 and B5 will be conducted in a manner that is similar to the B5 to B6 zone. Any lessons learned will be used to optimize the remediation for this section. The use of temporary berms to create workable zones will be assessed prior to filling the overall section and the amount of water that remains in the zone and that requires treatment. The LCS will be controlled in accordance with the leachate management section.



3.4 Between B1 and B2

Analytical results within this section of the ditch shows that this water does not require any prior treatment prior to being moved to the West Retention Pond. There does not appear to be any risk for potential leachate seeps in this area due to the distance between B1 - B2 ditch and the LCS. Therefore, this area will be remediated by moving the water to the West Retention Pond, and installing a clay plug and the anchor trench. This section will be the last section to be completed.



3.5 Final Cover Anchor Trench

Once the remedial South Ditch infill work has been completed and the LCS leachate level is approaching the normal operating range (196 to 197 mASL), the final cover anchor trench will be installed. The anchor trench is current being designed in preparation for the installation of final cover on Cell 19-1. The anchor trench will extend along the total length of the South Ditch. The anchor trench will in accordance with the concept and dimensions provided in the approved Design and Operations Report.

3.6 West Process Pond

The company will empty the West Process Pond, and once empty will have the pond liner mended by a contractor. Once the liner is mended, the south ditch water will be moved into this pond. This will facilitate the timely remediation of the south ditch and installation of the clay plug.

The water collected in the West Process Pond will then be treated as per section 2.3.1.2.

4. Leachate Collection System

4.1 Leachate Frac Tanks

To handle the high levels within the LCS the company proposes to use up to 20 Frac tanks onsite for temporary storage. Leachate from the LCS would be pumped into the Frac tanks to reduce leachate levels within in the LCS. Throughout this the company will continue to dispose of leachate through the incinerator secondary zone. The Frac tanks would be stored within individual containment provided by the vendor. The Frac tanks will be managed to the following requirements:

- 1) No more than 20 Frac Tanks shall be installed at the Site for temporary leachate storage;
- 2) All Frac tanks shall; have secondary containment supplied by the vendor
- 3) Operate, use and maintain the frac tanks in accordance with the incinerator ECA;
- 4) Store all Frac tanks in the maintenance yard at the site;
- 5) All frac tank vents will be connected in series and vented through a caustic scrubber (as approved in the leachate pond cover ECA) and a carbon bed;
- 6) Monitor and record the pressure of the frac tanks on the inlet to the caustic scrubber once daily;
- 7) Monitor the volume of leachate added or removed from the frac tanks on a daily basis; provide this information to MECP weekly on a separate tab of the LDR storage report;
- 8) By June 28, 2019 provide a plan to the Provincial Officer with a plan for the removal of the frac tanks from the site. The plan needs to include the removal of leachate, the cleaning of the frac tanks and timelines.

4.2 Operation During Remediation Activities

During the remediation period, the objective is to maintain the LCS leachate elevation at a level that is lower than the South Ditch water elevation. This will maintain an inward gradient from the South Ditch to the LCS and minimize the potential for leachate to seep to the South Ditch.

During active remediation in an area (excavation and initial filling), the LCS sump that is closest to the remediation zone will be pumped and the leachate transferred to the main leachate holding tank prior to incineration or to the frac tanks for storage. This will minimize the potential for localized leachate seepage into the dewatered area. During the remediation period on May 14th, Sump No. 3 was pumped to lower the leachate head in the area of the work. The following table provides hourly results related to volume pumped during the hour and the leachate head at Sump 3 (south west corner) and Sump 4 (mid-point of South Ditch). The results indicated that the LCS leachate elevation can be lowered by 0.5 to 0.7 m in the local area and by 0.2 m about 200 m along the trench. The reduction in leachate elevation successfully prevented the seep from draining and allowed the seep area to be excavated and sealed with compacted clay.

Date and Time (Start of Period)	Sump 3 Volume Pumped (L)	Sump 3 Leachate Elevation (m ASL)	Sump 4 Leachate Elevation (m ASL)
5/14/2019 8:00	0	201.53	201.82
5/14/2019 9:00	9979	201.18	201.82
5/14/2019 10:00	14273	201.05	201.82
5/14/2019 11:00	14320	201.00	201.80
5/14/2019 12:00	14515	200.95	201.78
5/14/2019 13:00	14727	200.93	201.76
5/14/2019 14:00	14456	200.89	201.73
5/14/2019 15:00	14325	200.86	201.71
5/14/2019 16:00	14548	200.83	201.68
5/14/2019 17:00	14645	201.16	201.60
5/14/2019 18:00	4375	201.31	201.63
5/14/2019 19:00	155	201.33	201.66

4.3 Leachate Management

Clean Harbors is committed to destroy a minimum of 1.3 million litres of leachate each month. In addition to committing to the leachate destruction rate, the following actions will be conducted:

- The size of the active subcells for Cell 19-2 will be reduced from 12,000 m² to be approximately 5,000 m²/subcell to reduce leachate generation. This size of active subcell will supply about 4 to 6 weeks of waste disposal capacity. The implementation of smaller cells should provide on average an 800,000 liters of surplus leachate volume which can be utilized to reduce the LCS, elimination of the leachate Frac tanks and eventually leachate within the three leachate ponds.
- Interim cover will be installed once a subcell reaches finished waste grades (subject to weather conditions)
- Final cover will be installed on Cell 19-1 (approximately 6 hectares) in 2019.
- The final cover anchor trench will be installed along the full length of the South Ditch to minimize stormwater infiltration to the LCS.
- Leachate destruction will be focused on returning the LCS to the normal operating elevations, then to destruction of leachate that is stored in the frac tanks, and finally to the destruction of the leachate that is stored in the on-site leachate storage ponds. The rate of destruction will depend on weather conditions, and the timing Long Term Leachate Management Strategy submitted to the MECP.
- Clean Harbors will continue to discuss with MECP approvals staff the options proposed for increasing the leachate destruction rate.

5. Sampling Plan

The sampling program will consist of the routine samples required of the EQ Pond, the West Retention Pond and the East Retention Pond and as specified in the storm water management plan ECA. This testing is not discussed further. The time period for request the laboratory to provide the results will be determined by Clean Harbors. Initial or critical samples will be requested for rush analysis, the other samples will be normal turn-around time. The additional sampling plan is summarized as follows:

Location	Parameter	Rate	Comments
EQ Pond Discharge	VOC (standard list)	Daily (regular third-party laboratory turn-around time)	Until South Ditch is infilled and one week after the last of the South Ditch treated water has been discharged to West Pond
South Ditch Treatment Plant Discharge	VOC (standard list)	Every 5 th frac tank (third-party laboratory rush 24-hour turn-around time)	Required until South Ditch Water treated.
	Metals (standard list)	One sample monthly (regular third-party laboratory turn-around time)	Required until South Ditch Water treated. To be sampled on the same day as the monthly surface water monitoring samples.
South Ditch Treatment Plant Influent	VOC (standard list)	Every 5 th frac tank	Sample held pending result and only tested if effluent shows an impact
	Metals (standard list)	One sample monthly (regular third-party laboratory turn-around time)	Required until South Ditch Water treated. To be sampled on the same day as the monthly surface water monitoring samples.

On May 23, 2019 the company will conduct another south ditch treatment test through the carbon treatment unit. Samples will be collected of the influent and effluent and submitted to the ALS analysis for metal and VOC analysis. Samples will be requested for rush analysis and results will be submitted to MECP for their review.

Clean Harbors will collect additional samples of the South Ditch or pond water on an as required basis to assess the general strength of the water, potential concerns, or obtaining general knowledge and confirmation.

Water elevations will be collected by Clean Harbors at minimum of twice per week of the pond and ditch levels, and the LCS levels. These levels will allow the water levels to be assessed and to assess the potential water movement direction for various sections/locations.

6. Contingency Plans

6.1 Leachate Seeps

During remedial work in an area, the LCS will be pumped at Sumps 3 and/or 4 to provide a localized reduction in the LCS during the active remedial work. This LCS level management will reduce the potential for a leachate seep to be present, especially in the upper surface zone, and to reduce the hydraulic pressure on the LCS side wall.

Should a leachate seep be identified the remedial response will be as follows:

- Isolate the seep location with clay berms or other materials that will contain the seep and minimize/reduce the impact area.
- Pump the collected leachate to the local LCS clean-out. If volume is small and quickly controlled a site vacuum truck may be used to remove the leachate.
- Assess the ability of the LCS system to control the seep discharge
- Take steps to the reduce the seep flow and seal the seep area with a clay plug and additional compacted clay material

6.2 Carbon Breakthrough

Assess the VOC analytical results for treatment effluent samples and EQ Pond samples when received to determine if VOC results show VOC levels that are below the PWQO including acetone level. If sample results are unacceptable as noted in this plan, assess influent results to assess breakthrough and need to replace activated carbon.

7. Schedule and Reporting

The work program provided represents the current discussions. Clean Harbors will provide a weekly email update to the MECP on Friday afternoons. The weekly update will include information documenting work performed in the previous week and plans for the future week. An update on sampling results will be provided if available. Minor amendments to the work program based on lessons learned and data collected will be provided as part of the weekly email.

Clean Harbors will contact the MECP immediately upon receiving EQ sampling results that indicate any of the treatment system are not performing as intended in the document (i.e. unacceptable VOC levels).

APPENDIX A

Results Summary L2276181

Job Reference 44985-30-10
Report To LAURA ERMETA, GHD Limited (Waterloo)
Date Received 21-May-2019 14:36
Report Date 22-May-2019 12:31
Report Version 1

Client Sample ID			BD#1	BD#2	BD#3
Date Sampled			17-May-2019	17-May-2019	17-May-2019
Time Sampled			15:00	15:00	15:00
ALS Sample ID			L2276181-1	L2276181-2	L2276181-3
Parameter	Lowest Detection Limit	Units	B4 - B5 Water	B5 - B6 Water	B6 - B7 Water

Volatile Organic Compounds (Water)

Parameter	Lowest Detection Limit	Units	B4 - B5 Water	B5 - B6 Water	B6 - B7 Water
Acetone	20	ug/L	1720	650	11400
Benzene	0.50	ug/L	<0.50	<0.50	1.29
Bromodichloromethane	1.0	ug/L	<1.0	<1.0	<1.0
Bromoform	1.0	ug/L	<1.0	<1.0	<1.0
Bromomethane	0.50	ug/L	<0.50	<0.50	<0.50
Carbon Disulfide	1.0	ug/L	<1.0	<1.0	14.5
Carbon tetrachloride	0.50	ug/L	<0.50	<0.50	<0.50
Chlorobenzene	0.50	ug/L	<0.50	<0.50	<0.50
Dibromochloromethane	1.0	ug/L	<1.0	<1.0	<1.0
Chloroethane	1.0	ug/L	<1.0	<1.0	<1.0
Chloroform	1.0	ug/L	<1.0	<1.0	<1.0
Chloromethane	1.0	ug/L	<1.0	<1.0	<1.0
1,2-Dibromoethane	0.20	ug/L	<0.20	<0.20	<0.20
1,2-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	<0.50
1,3-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	<0.50
1,4-Dichlorobenzene	0.50	ug/L	<0.50	<0.50	<0.50
Dichlorodifluoromethane	1.0	ug/L	<1.0	<1.0	<1.0
1,1-Dichloroethane	0.50	ug/L	<0.50	<0.50	0.73
1,2-Dichloroethane	0.50	ug/L	<0.50	<0.50	1.31
1,1-Dichloroethylene	0.50	ug/L	<0.50	<0.50	<0.50
cis-1,2-Dichloroethylene	0.50	ug/L	1.56	1.44	42.2
trans-1,2-Dichloroethylene	0.50	ug/L	<0.50	<0.50	<0.90
Dichloromethane	2.0	ug/L	<2.0	<2.0	24.0
1,2-Dichloropropane	0.50	ug/L	<0.50	<0.50	<0.50
cis-1,3-Dichloropropene	0.50	ug/L	<0.50	<0.50	<0.50
trans-1,3-Dichloropropene	0.50	ug/L	<0.50	<0.50	<0.50
Ethylbenzene	0.50	ug/L	<0.50	<0.50	2.27
n-Hexane	0.50	ug/L	<0.50	<0.50	<0.50
2-Hexanone	20	ug/L	<20	<20	<20
Methyl Ethyl Ketone	20	ug/L	370	130	4900
Methyl Isobutyl Ketone	20	ug/L	<20	<20	279
MTBE	0.50	ug/L	1.64	1.40	32.9
Styrene	0.50	ug/L	<0.50	<0.50	<0.50
1,1,1,2-Tetrachloroethane	0.50	ug/L	<0.50	<0.50	<0.50
1,1,2,2-Tetrachloroethane	0.50	ug/L	<0.50	<0.50	<0.50
Tetrachloroethylene	0.50	ug/L	<0.50	<0.50	<0.50
Toluene	0.50	ug/L	1.49	<0.50	58.3
1,1,1-Trichloroethane	0.50	ug/L	<0.50	<0.50	<0.50
1,1,2-Trichloroethane	0.50	ug/L	<0.50	<0.50	<0.50
Trichloroethylene	0.50	ug/L	<0.50	<0.50	1.59
Trichlorofluoromethane	1.0	ug/L	<1.0	<1.0	<1.0
Vinyl chloride	0.50	ug/L	<0.50	<0.50	<0.50
o-Xylene	0.50	ug/L	<0.50	<0.50	6.20
m+p-Xylenes	1.0	ug/L	<1.0	<1.0	10.5
Xylenes (Total)	1.1	ug/L	<1.1	<1.1	16.7

Appendix C

Analytical Data Collected During Effluent Discharge



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 14-JAN-20
Report Date: 21-JAN-20 13:35 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2405226
Project P.O. #: 73506479
Job Reference: 44985-20-19
C of C Numbers:
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
L2405226-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-JAN-20 @ 12:00							
Matrix: WATER							
Field Tests							
pH, Client Supplied	7.70		0.10	pH		15-JAN-20	R4968886
Temperature, Client	6.6		-50	Deg. C		15-JAN-20	R4968886
Physical Tests							
Conductivity	902		3.0	umhos/cm		15-JAN-20	R4971580
Hardness (as CaCO3)	283	HTC	1.3	mg/L		15-JAN-20	
pH	8.40		0.10	pH units		15-JAN-20	R4971580
Total Suspended Solids	6.5		2.0	mg/L	17-JAN-20	20-JAN-20	R4972921
Total Dissolved Solids	505	DLDS	20	mg/L		16-JAN-20	R4973211
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	161		10	mg/L		15-JAN-20	R4971580
Unionized ammonia	0.00122		0.000086	mg/L		16-JAN-20	
Ammonia, Total (as N)	0.143		0.010	mg/L		15-JAN-20	R4969875
Bromide (Br)	2.50		0.10	mg/L		15-JAN-20	R4971804
Chloride (Cl)	79.7		0.50	mg/L		15-JAN-20	R4971804
Fluoride (F)	0.732		0.020	mg/L		15-JAN-20	R4971804
Nitrate (as N)	0.280		0.020	mg/L		15-JAN-20	R4971804
Nitrite (as N)	<0.010		0.010	mg/L		15-JAN-20	R4971804
Total Kjeldahl Nitrogen	0.90		0.15	mg/L	16-JAN-20	17-JAN-20	R4972449
Phosphorus, Total	0.0266		0.0030	mg/L	15-JAN-20	17-JAN-20	R4972332
Sulfate (SO4)	159		0.30	mg/L		15-JAN-20	R4971804
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-JAN-20	R4969947
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					14-JAN-20	R4968668
Dissolved Organic Carbon	5.78		0.50	mg/L	14-JAN-20	16-JAN-20	R4972366
Total Metals							
Aluminum (Al)-Total	0.161		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Antimony (Sb)-Total	0.00038		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Arsenic (As)-Total	0.00132		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Barium (Ba)-Total	0.0625		0.00020	mg/L	15-JAN-20	15-JAN-20	R4969649
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Boron (B)-Total	0.113		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Cadmium (Cd)-Total	<0.00020	DLM	0.00020	mg/L	15-JAN-20	15-JAN-20	R4969649
Calcium (Ca)-Total	77.1		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Cobalt (Co)-Total	0.00058		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Copper (Cu)-Total	0.0025		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649
Iron (Fe)-Total	0.168		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Lead (Pb)-Total	0.00035		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Magnesium (Mg)-Total	22.1		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Manganese (Mn)-Total	0.0444		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Mercury (Hg)-Total	0.000052		0.000050	mg/L		15-JAN-20	R4969609

* 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
L2405226-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-JAN-20 @ 12:00							
Matrix: WATER							
Total Metals							
Molybdenum (Mo)-Total	0.0647		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Nickel (Ni)-Total	0.00604		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Potassium (K)-Total	21.3		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Selenium (Se)-Total	0.00130		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Silicon (Si)-Total	0.79		0.10	mg/L	15-JAN-20	15-JAN-20	R4969649
Silver (Ag)-Total	<0.000050		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Sodium (Na)-Total	63.0		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Strontium (Sr)-Total	0.583		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649
Thallium (Tl)-Total	0.000134		0.000010	mg/L	15-JAN-20	15-JAN-20	R4969649
Tin (Sn)-Total	<0.00010		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Vanadium (V)-Total	0.00053		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Zinc (Zn)-Total	0.0044		0.0030	mg/L	15-JAN-20	15-JAN-20	R4969649
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		15-JAN-20	R4969769
Aggregate Organics							
COD	24		10	mg/L		21-JAN-20	R4973616
Phenols (4AAP)	0.0022		0.0010	mg/L		15-JAN-20	R4969951
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-JAN-20	R4969286
Benzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Bromodichloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromoform	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromomethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Carbon tetrachloride	<0.50		0.50	ug/L		15-JAN-20	R4969286
Chlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dibromochloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroform	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JAN-20	R4969286
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichloromethane	<2.0		2.0	ug/L		15-JAN-20	R4969286
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286

* 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
L2405226-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-JAN-20 @ 12:00							
Matrix: WATER							
Volatile Organic Compounds							
Ethylbenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
n-Hexane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Methyl Ethyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
Methyl Isobutyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
MTBE	<0.50		0.50	ug/L		15-JAN-20	R4969286
Styrene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Tetrachloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Toluene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichlorofluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Vinyl chloride	<0.50		0.50	ug/L		15-JAN-20	R4969286
o-Xylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
m+p-Xylenes	<1.0		1.0	ug/L		15-JAN-20	R4969286
Xylenes (Total)	<1.1		1.1	ug/L		15-JAN-20	
Surrogate: 4-Bromofluorobenzene	101.8		70-130	%		15-JAN-20	R4969286
Surrogate: 1,4-Difluorobenzene	103.0		70-130	%		15-JAN-20	R4969286
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-JAN-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	17-JAN-20	21-JAN-20	R4973469
Surrogate: 2,4,6-Tribromophenol	109.7		40-150	%	17-JAN-20	21-JAN-20	R4973469
Semi-Volatile Organics							
Acenaphthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Acenaphthylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)pyrene	<0.13	DLIS	0.13	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(b)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(ghi)perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(k)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
4-Chloroaniline	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Bis(2-chloroethyl)ether	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2-Chlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Chrysene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dibenzo(a,h)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,3-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,4-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190

* 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
L2405226-1 EQ POND DISCHARGE Sampled By: CLIENT on 13-JAN-20 @ 12:00 Matrix: WATER							
Semi-Volatile Organics							
3,3'-Dichlorobenzidine	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dichlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Diethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dimethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dimethylphenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrophenol	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,6-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Bis(2-ethylhexyl)phthalate	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluorene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobenzene	<0.10	DLIS	0.10	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobutadiene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Indeno(1,2,3-cd)pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Naphthalene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pentachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Phenanthrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,5-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,6-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2,4-Trichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,5-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,6-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Surrogate: 2-Fluorobiphenyl	82.3		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: Nitrobenzene d5	84.3		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: p-Terphenyl d14	101.2		40-130	%	17-JAN-20	21-JAN-20	R4973190
Report Remarks : raised Cd LOR to remove potential Mo interference							
L2405226-2 WEST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:15 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.80		0.10	pH		15-JAN-20	R4968886
Temperature, Client	7.2		-50	Deg. C		15-JAN-20	R4968886
Physical Tests							
Conductivity	918		3.0	umhos/cm		15-JAN-20	R4971580
Hardness (as CaCO3)	293	HTC	1.3	mg/L		15-JAN-20	
pH	8.26		0.10	pH units		15-JAN-20	R4971580
Total Suspended Solids	12.0		2.0	mg/L	17-JAN-20	20-JAN-20	R4972921
Total Dissolved Solids	529	DLDS	20	mg/L		16-JAN-20	R4973211

* 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
L2405226-2 WEST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:15 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Alkalinity, Total (as CaCO ₃)	160		10	mg/L		15-JAN-20	R4971580
Unionized ammonia	0.00404		0.00011	mg/L		16-JAN-20	
Ammonia, Total (as N)	0.357		0.010	mg/L		15-JAN-20	R4969875
Bromide (Br)	2.41		0.10	mg/L		15-JAN-20	R4971804
Chloride (Cl)	80.8		0.50	mg/L		15-JAN-20	R4971804
Fluoride (F)	0.667		0.020	mg/L		15-JAN-20	R4971804
Nitrate (as N)	0.112		0.020	mg/L		15-JAN-20	R4971804
Nitrite (as N)	<0.010		0.010	mg/L		15-JAN-20	R4971804
Total Kjeldahl Nitrogen	1.05		0.15	mg/L	16-JAN-20	17-JAN-20	R4972449
Phosphorus, Total	0.0522		0.0030	mg/L	15-JAN-20	17-JAN-20	R4972332
Sulfate (SO ₄)	169		0.30	mg/L		15-JAN-20	R4971804
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-JAN-20	R4969947
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					14-JAN-20	R4968668
Dissolved Organic Carbon	6.55		0.50	mg/L	14-JAN-20	16-JAN-20	R4972366
Total Metals							
Aluminum (Al)-Total	1.08		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Antimony (Sb)-Total	0.00046		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Arsenic (As)-Total	0.00266		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Barium (Ba)-Total	0.0735		0.00020	mg/L	15-JAN-20	15-JAN-20	R4969649
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Bismuth (Bi)-Total	0.000051		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Boron (B)-Total	0.107		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Cadmium (Cd)-Total	<0.00040	DLM	0.00040	mg/L	15-JAN-20	15-JAN-20	R4969649
Calcium (Ca)-Total	77.7		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Cobalt (Co)-Total	0.00113		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Copper (Cu)-Total	0.0040		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649
Iron (Fe)-Total	1.26		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Lead (Pb)-Total	0.00226		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Magnesium (Mg)-Total	24.0		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Manganese (Mn)-Total	0.0473		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Mercury (Hg)-Total	0.0000583		0.0000050	mg/L		15-JAN-20	R4969609
Molybdenum (Mo)-Total	0.0630		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Nickel (Ni)-Total	0.00744		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Potassium (K)-Total	20.4		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Selenium (Se)-Total	0.00170		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Silicon (Si)-Total	2.87		0.10	mg/L	15-JAN-20	15-JAN-20	R4969649
Silver (Ag)-Total	<0.000050		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Sodium (Na)-Total	59.4		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Strontium (Sr)-Total	0.579		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2405226-2 WEST STORM WATER POND							
Sampled By: CLIENT on 13-JAN-20 @ 12:15							
Matrix: WATER							
Total Metals							
Thallium (Tl)-Total	0.000123		0.000010	mg/L	15-JAN-20	15-JAN-20	R4969649
Tin (Sn)-Total	0.00017		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Vanadium (V)-Total	0.00256		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Zinc (Zn)-Total	0.0107		0.0030	mg/L	15-JAN-20	15-JAN-20	R4969649
Speciated Metals							
Chromium, Hexavalent	0.00129		0.00050	mg/L		15-JAN-20	R4969769
Aggregate Organics							
COD	26		10	mg/L		21-JAN-20	R4973616
Phenols (4AAP)	0.0031		0.0010	mg/L		15-JAN-20	R4969951
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-JAN-20	R4969286
Benzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Bromodichloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromoform	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromomethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Carbon tetrachloride	<0.50		0.50	ug/L		15-JAN-20	R4969286
Chlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dibromochloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroform	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JAN-20	R4969286
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichloromethane	<2.0		2.0	ug/L		15-JAN-20	R4969286
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Ethylbenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
n-Hexane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Methyl Ethyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
Methyl Isobutyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
MTBE	<0.50		0.50	ug/L		15-JAN-20	R4969286
Styrene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286

* 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
L2405226-2 WEST STORM WATER POND							
Sampled By: CLIENT on 13-JAN-20 @ 12:15							
Matrix: WATER							
Volatile Organic Compounds							
Tetrachloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Toluene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichlorofluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Vinyl chloride	<0.50		0.50	ug/L		15-JAN-20	R4969286
o-Xylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
m+p-Xylenes	<1.0		1.0	ug/L		15-JAN-20	R4969286
Xylenes (Total)	<1.1		1.1	ug/L		15-JAN-20	
Surrogate: 4-Bromofluorobenzene	100.6		70-130	%		15-JAN-20	R4969286
Surrogate: 1,4-Difluorobenzene	102.7		70-130	%		15-JAN-20	R4969286
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-JAN-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	17-JAN-20	21-JAN-20	R4973469
Surrogate: 2,4,6-Tribromophenol	114.6		40-150	%	17-JAN-20	21-JAN-20	R4973469
Semi-Volatile Organics							
Acenaphthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Acenaphthylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)pyrene	<0.13	DLIS	0.13	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(b)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(ghi)perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(k)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
4-Chloroaniline	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Bis(2-chloroethyl)ether	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2-Chlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Chrysene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dibenzo(a,h)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,3-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,4-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
3,3'-Dichlorobenzidine	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dichlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Diethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dimethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dimethylphenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrophenol	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,6-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190

* 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
L2405226-2 WEST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:15 Matrix: WATER							
Semi-Volatile Organics							
Bis(2-ethylhexyl)phthalate	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluorene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobenzene	<0.10	DLIS	0.10	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobutadiene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Indeno(1,2,3-cd)pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Naphthalene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pentachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Phenanthrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,5-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,6-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2,4-Trichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,5-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,6-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Surrogate: 2-Fluorobiphenyl	80.8		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: Nitrobenzene d5	84.5		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: p-Terphenyl d14	97.2		40-130	%	17-JAN-20	21-JAN-20	R4973190
Report Remarks : raised Cd LOR to remove potential	Mo interference						
L2405226-3 ERP-EAST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:30 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.60		0.10	pH		15-JAN-20	R4968886
Temperature, Client	6.0		-50	Deg. C		15-JAN-20	R4968886
Physical Tests							
Conductivity	742		3.0	umhos/cm		15-JAN-20	R4971580
Hardness (as CaCO3)	311	HTC	1.3	mg/L		15-JAN-20	
pH	7.93		0.10	pH units		15-JAN-20	R4971580
Total Suspended Solids	152		2.0	mg/L	17-JAN-20	20-JAN-20	R4972921
Total Dissolved Solids	480	DLDS	20	mg/L		16-JAN-20	R4973211
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	131		10	mg/L		15-JAN-20	R4971580
Unionized ammonia	0.00562		0.00033	mg/L		16-JAN-20	
Ammonia, Total (as N)	0.864	DLHC	0.050	mg/L		15-JAN-20	R4969875
Bromide (Br)	1.58		0.10	mg/L		15-JAN-20	R4971804
Chloride (Cl)	64.3		0.50	mg/L		15-JAN-20	R4971804
Fluoride (F)	0.495		0.020	mg/L		15-JAN-20	R4971804
Nitrate (as N)	0.194		0.020	mg/L		15-JAN-20	R4971804

* 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
L2405226-3 ERP-EAST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:30 Matrix: WATER							
Anions and Nutrients							
Nitrite (as N)	<0.010		0.010	mg/L		15-JAN-20	R4971804
Total Kjeldahl Nitrogen	1.81		0.15	mg/L	16-JAN-20	17-JAN-20	R4972449
Phosphorus, Total	0.189		0.0030	mg/L	15-JAN-20	17-JAN-20	R4972332
Sulfate (SO4)	137		0.30	mg/L		15-JAN-20	R4971804
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-JAN-20	R4969947
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					14-JAN-20	R4968668
Dissolved Organic Carbon	5.38		0.50	mg/L	14-JAN-20	16-JAN-20	R4972366
Total Metals							
Aluminum (Al)-Total	5.52		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Antimony (Sb)-Total	0.00062		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Arsenic (As)-Total	0.00373		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Barium (Ba)-Total	0.0883		0.00020	mg/L	15-JAN-20	15-JAN-20	R4969649
Beryllium (Be)-Total	0.00024		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Bismuth (Bi)-Total	0.000136		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Boron (B)-Total	0.112		0.010	mg/L	15-JAN-20	15-JAN-20	R4969649
Cadmium (Cd)-Total	<0.00090	DLM	0.00090	mg/L	15-JAN-20	15-JAN-20	R4969649
Calcium (Ca)-Total	82.1		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Cobalt (Co)-Total	0.00457		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Copper (Cu)-Total	0.0101		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649
Iron (Fe)-Total	8.10		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Lead (Pb)-Total	0.00926		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Magnesium (Mg)-Total	25.8		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Manganese (Mn)-Total	0.167		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Mercury (Hg)-Total	0.0000833		0.000050	mg/L		15-JAN-20	R4969609
Molybdenum (Mo)-Total	0.0628		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Nickel (Ni)-Total	0.0158		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Potassium (K)-Total	18.0		0.050	mg/L	15-JAN-20	15-JAN-20	R4969649
Selenium (Se)-Total	0.00152		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Silicon (Si)-Total	11.1		0.10	mg/L	15-JAN-20	15-JAN-20	R4969649
Silver (Ag)-Total	<0.000050		0.000050	mg/L	15-JAN-20	15-JAN-20	R4969649
Sodium (Na)-Total	41.3		0.50	mg/L	15-JAN-20	15-JAN-20	R4969649
Strontium (Sr)-Total	0.566		0.0010	mg/L	15-JAN-20	15-JAN-20	R4969649
Thallium (Tl)-Total	0.000325		0.000010	mg/L	15-JAN-20	15-JAN-20	R4969649
Tin (Sn)-Total	0.00031		0.00010	mg/L	15-JAN-20	15-JAN-20	R4969649
Vanadium (V)-Total	0.0124		0.00050	mg/L	15-JAN-20	15-JAN-20	R4969649
Zinc (Zn)-Total	0.0457		0.0030	mg/L	15-JAN-20	15-JAN-20	R4969649
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		15-JAN-20	R4969769
Aggregate Organics							
COD	48		10	mg/L		21-JAN-20	R4973616

* 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
L2405226-3 ERP-EAST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:30 Matrix: WATER							
Aggregate Organics							
Phenols (4AAP)	0.0046		0.0010	mg/L		15-JAN-20	R4969951
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-JAN-20	R4969286
Benzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Bromodichloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromoform	<1.0		1.0	ug/L		15-JAN-20	R4969286
Bromomethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Carbon tetrachloride	<0.50		0.50	ug/L		15-JAN-20	R4969286
Chlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dibromochloromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Chloroform	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JAN-20	R4969286
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Dichloromethane	<2.0		2.0	ug/L		15-JAN-20	R4969286
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JAN-20	R4969286
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Ethylbenzene	<0.50		0.50	ug/L		15-JAN-20	R4969286
n-Hexane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Methyl Ethyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
Methyl Isobutyl Ketone	<20		20	ug/L		15-JAN-20	R4969286
MTBE	<0.50		0.50	ug/L		15-JAN-20	R4969286
Styrene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Tetrachloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Toluene	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichloroethylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
Trichlorofluoromethane	<1.0		1.0	ug/L		15-JAN-20	R4969286
Vinyl chloride	<0.50		0.50	ug/L		15-JAN-20	R4969286

* 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
L2405226-3 ERP-EAST STORM WATER POND							
Sampled By: CLIENT on 13-JAN-20 @ 12:30							
Matrix: WATER							
Volatile Organic Compounds							
o-Xylene	<0.50		0.50	ug/L		15-JAN-20	R4969286
m+p-Xylenes	<1.0		1.0	ug/L		15-JAN-20	R4969286
Xylenes (Total)	<1.1		1.1	ug/L		15-JAN-20	
Surrogate: 4-Bromofluorobenzene	100.5		70-130	%		15-JAN-20	R4969286
Surrogate: 1,4-Difluorobenzene	102.7		70-130	%		15-JAN-20	R4969286
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-JAN-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	17-JAN-20	21-JAN-20	R4973469
Surrogate: 2,4,6-Tribromophenol	111.3		40-150	%	17-JAN-20	21-JAN-20	R4973469
Semi-Volatile Organics							
Acenaphthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Acenaphthylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(a)pyrene	<0.13	DLIS	0.13	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(b)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(ghi)perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Benzo(k)fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
4-Chloroaniline	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Bis(2-chloroethyl)ether	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2-Chlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Chrysene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dibenzo(a,h)anthracene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,3-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
1,4-Dichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
3,3'-Dichlorobenzidine	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dichlorophenol	<0.75	DLIS	0.75	ug/L	17-JAN-20	21-JAN-20	R4973190
Diethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Dimethylphthalate	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dimethylphenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrophenol	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,6-Dinitrotoluene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Bis(2-ethylhexyl)phthalate	<2.5	DLIS	2.5	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluoranthene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Fluorene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobenzene	<0.10	DLIS	0.10	ug/L	17-JAN-20	21-JAN-20	R4973190
Hexachlorobutadiene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Indeno(1,2,3-cd)pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
1-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190

* 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
L2405226-3 ERP-EAST STORM WATER POND Sampled By: CLIENT on 13-JAN-20 @ 12:30 Matrix: WATER							
Semi-Volatile Organics							
2-Methylnaphthalene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
Naphthalene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pentachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Perylene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Phenanthrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
Pyrene	<0.50	DLIS	0.50	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,5-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,3,4,6-Tetrachlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
1,2,4-Trichlorobenzene	<1.0	DLIS	1.0	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,5-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
2,4,6-Trichlorophenol	<1.3	DLIS	1.3	ug/L	17-JAN-20	21-JAN-20	R4973190
Surrogate: 2-Fluorobiphenyl	81.4		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: Nitrobenzene d5	86.0		40-130	%	17-JAN-20	21-JAN-20	R4973190
Surrogate: p-Terphenyl d14	98.1		40-130	%	17-JAN-20	21-JAN-20	R4973190
Report Remarks : raised Cd LOR to remove potential Mo interference							

* 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)
Laboratory Control Sample	1,3-Dichlorobenzene	LCS-ND	L2405226-1, -2, -3
Laboratory Control Sample	3,3'-Dichlorobenzidine	LCS-ND	L2405226-1, -2, -3
Laboratory Control Sample	4-Chloroaniline	LCS-ND	L2405226-1, -2, -3
Matrix Spike	Bromide (Br)	MS-B	L2405226-1, -2, -3
Matrix Spike	Aluminum (Al)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Boron (B)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Calcium (Ca)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Iron (Fe)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Manganese (Mn)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Potassium (K)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Silicon (Si)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Zinc (Zn)-Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Ammonia, Total (as N)	MS-B	L2405226-1, -2, -3
Matrix Spike	Phosphorus, Total	MS-B	L2405226-1, -2, -3
Matrix Spike	Sulfate (SO ₄)	MS-B	L2405226-1, -2, -3

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLIS	Detection Limit Adjusted: Insufficient Sample
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
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**
625-ACID-EXTRA-WT	Water	EPA 8270 Acid Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-WT	Water	EPA 8270 Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
N-nitrosodiphenylamine is reported as diphenylamine. N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine. (EPA 8270D)			
ALK-WT	Water	Alkalinity, Total (as CaCO ₃)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
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).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with			

Reference Information

detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference

COD-T-WT	Water	Chemical Oxygen Demand	APHA 5220 D
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This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

CR-CR6-IC-WT	Water	Chromium +6	EPA 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. 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).

DOC-WT	Water	Dissolved Organic Carbon	APHA 5310B
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Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

EC-SCREEN-WT	Water	Conductivity Screen (Internal Use Only)	APHA 2510
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Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT	Water	Conductivity	APHA 2510 B
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Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-NH3-UNION-CLI-WT	Water	Un-ionized ammonia	CALCULATION
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F-IC-N-WT	Water	Fluoride in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-WT	Water	Hardness	APHA 2340 B
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Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
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Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)
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Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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).

NH3-F-WT	Water	Ammonia in Water by Fluorescence	J. ENVIRON. MONIT., 2005, 7, 37-42, RSC
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This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Weston et al.

NO2-IC-WT	Water	Nitrite in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT	Water	Nitrate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT	Water	Total P in Water by Colour	APHA 4500-P PHOSPHORUS
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This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH,TEMP-CLIENT-WT	Water	pH & Temperature	Results supplied by client
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Reference Information

PH-WT Water pH APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

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). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT Water Phenol (4AAP) EPA 9066

An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT Water Sulfate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT Water Total Dissolved Solids APHA 2540C

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

SOLIDS-TSS-WT Water Suspended solids APHA 2540 D-Gravimetric

A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.

THM-SUM-PPB-CALC-WT Water Total Trihalomethanes (THMs) CALCULATION

Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-WT Water Total Kjeldahl Nitrogen APHA 4500-Norg D

This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

VOC-ROU-HS-WT Water Volatile Organic Compounds SW846 8260

Aqueous samples are analyzed by headspace-GC/MS.

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:

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: L2405226

Report Date: 21-JAN-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-ACID-EXTRA-WT	Water							
Batch	R4973469							
WG3259209-2	LCS							
2,3,6-Trichlorophenol			86.9		%		50-130	21-JAN-20
WG3259209-1	MB							
2,3,6-Trichlorophenol			<0.20		ug/L		0.2	21-JAN-20
Surrogate: 2,4,6-Tribromophenol			97.6		%		40-150	21-JAN-20
625-WT	Water							
Batch	R4973190							
WG3259209-2	LCS							
1-Methylnaphthalene			65.9		%		50-140	20-JAN-20
1,2-Dichlorobenzene			54.3		%		40-130	20-JAN-20
1,2,4-Trichlorobenzene			51.0		%		50-130	20-JAN-20
1,3-Dichlorobenzene			49.2	LCS-ND	%		50-140	20-JAN-20
1,4-Dichlorobenzene			56.8		%		40-130	20-JAN-20
2-Chlorophenol			89.8		%		65-130	20-JAN-20
2-Methylnaphthalene			64.4		%		50-140	20-JAN-20
2,3,4,5-Tetrachlorophenol			111.0		%		50-130	20-JAN-20
2,3,4,6-Tetrachlorophenol			108.0		%		65-130	20-JAN-20
2,4-Dichlorophenol			102.8		%		65-130	20-JAN-20
2,4-Dimethylphenol			84.4		%		30-130	20-JAN-20
2,4-Dinitrophenol			139.1		%		40-140	21-JAN-20
2,4-Dinitrotoluene			118.0		%		50-140	20-JAN-20
2,4,5-Trichlorophenol			107.5		%		65-130	20-JAN-20
2,4,6-Trichlorophenol			105.5		%		65-130	20-JAN-20
2,6-Dinitrotoluene			109.8		%		50-140	20-JAN-20
3,3'-Dichlorobenzidine			26.7	LCS-ND	%		50-140	20-JAN-20
4-Chloroaniline			27.8	LCS-ND	%		30-140	20-JAN-20
Acenaphthene			80.3		%		50-140	20-JAN-20
Acenaphthylene			79.8		%		50-140	20-JAN-20
Anthracene			105.7		%		50-140	20-JAN-20
Benzo(a)anthracene			111.5		%		50-140	20-JAN-20
Benzo(a)pyrene			99.3		%		60-130	20-JAN-20
Benzo(b)fluoranthene			103.0		%		50-140	20-JAN-20
Benzo(ghi)perylene			101.0		%		50-140	20-JAN-20
Benzo(k)fluoranthene			101.5		%		50-140	20-JAN-20
Bis(2-chloroethyl)ether			97.1		%		50-140	20-JAN-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-WT	Water							
Batch	R4973190							
WG3259209-2	LCS							
Bis(2-ethylhexyl)phthalate			111.2		%		50-140	20-JAN-20
Chrysene			104.0		%		50-140	20-JAN-20
Dibenzo(a,h)anthracene			99.2		%		50-140	20-JAN-20
Diethylphthalate			101.3		%		50-140	20-JAN-20
Dimethylphthalate			100.1		%		50-140	20-JAN-20
Fluoranthene			109.5		%		50-140	20-JAN-20
Fluorene			89.4		%		50-140	20-JAN-20
Hexachlorobenzene			83.2		%		40-130	20-JAN-20
Hexachlorobutadiene			44.8		%		40-130	20-JAN-20
Indeno(1,2,3-cd)pyrene			99.8		%		50-140	20-JAN-20
Naphthalene			65.0		%		50-140	20-JAN-20
Pentachlorophenol			129.3		%		60-130	20-JAN-20
Perylene			79.1		%		50-140	20-JAN-20
Phenanthrene			101.2		%		50-140	20-JAN-20
Pyrene			101.7		%		50-140	20-JAN-20
WG3259209-1	MB							
1-Methylnaphthalene			<0.40		ug/L		0.4	20-JAN-20
1,2-Dichlorobenzene			<0.40		ug/L		0.4	20-JAN-20
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	20-JAN-20
1,3-Dichlorobenzene			<0.40		ug/L		0.4	20-JAN-20
1,4-Dichlorobenzene			<0.40		ug/L		0.4	20-JAN-20
2-Chlorophenol			<0.30		ug/L		0.3	20-JAN-20
2-Methylnaphthalene			<0.40		ug/L		0.4	20-JAN-20
2,3,4,5-Tetrachlorophenol			<0.50		ug/L		0.5	20-JAN-20
2,3,4,6-Tetrachlorophenol			<0.50		ug/L		0.5	20-JAN-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	20-JAN-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	20-JAN-20
2,4-Dinitrophenol			<1.0		ug/L		1	20-JAN-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	20-JAN-20
2,4,5-Trichlorophenol			<0.50		ug/L		0.5	20-JAN-20
2,4,6-Trichlorophenol			<0.50		ug/L		0.5	20-JAN-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	20-JAN-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	20-JAN-20
4-Chloroaniline			<0.40		ug/L		0.4	20-JAN-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-WT		Water						
Batch	R4973190							
WG3259209-1	MB							
Acenaphthene			<0.20		ug/L		0.2	20-JAN-20
Acenaphthylene			<0.20		ug/L		0.2	20-JAN-20
Anthracene			<0.20		ug/L		0.2	20-JAN-20
Benzo(a)anthracene			<0.20		ug/L		0.2	20-JAN-20
Benzo(a)pyrene			<0.050		ug/L		0.05	20-JAN-20
Benzo(b)fluoranthene			<0.20		ug/L		0.2	20-JAN-20
Benzo(ghi)perylene			<0.20		ug/L		0.2	20-JAN-20
Benzo(k)fluoranthene			<0.20		ug/L		0.2	20-JAN-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	20-JAN-20
Bis(2-ethylhexyl)phthalate			<1.0		ug/L		1	20-JAN-20
Chrysene			<0.20		ug/L		0.2	20-JAN-20
Dibenzo(a,h)anthracene			<0.20		ug/L		0.2	20-JAN-20
Diethylphthalate			<0.20		ug/L		0.2	20-JAN-20
Dimethylphthalate			<0.20		ug/L		0.2	20-JAN-20
Fluoranthene			<0.20		ug/L		0.2	20-JAN-20
Fluorene			<0.20		ug/L		0.2	20-JAN-20
Hexachlorobenzene			<0.040		ug/L		0.04	20-JAN-20
Hexachlorobutadiene			<0.20		ug/L		0.2	20-JAN-20
Indeno(1,2,3-cd)pyrene			<0.20		ug/L		0.2	20-JAN-20
Naphthalene			<0.20		ug/L		0.2	20-JAN-20
Pentachlorophenol			<0.50		ug/L		0.5	20-JAN-20
Perylene			<0.20		ug/L		0.2	20-JAN-20
Phenanthrene			<0.20		ug/L		0.2	20-JAN-20
Pyrene			<0.20		ug/L		0.2	20-JAN-20
Surrogate: 2-Fluorobiphenyl			86.7		%		40-130	20-JAN-20
Surrogate: Nitrobenzene d5			92.6		%		40-130	20-JAN-20
Surrogate: p-Terphenyl d14			99.9		%		40-130	20-JAN-20
ALK-WT		Water						
Batch	R4971580							
WG3258188-4	DUP	WG3258188-3						
Alkalinity, Total (as CaCO3)		161	160		mg/L	0.6	20	15-JAN-20
WG3258188-2	LCS							
Alkalinity, Total (as CaCO3)			89.0		%		85-115	15-JAN-20
WG3258188-1	MB							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT								
Water								
Batch	R4971580							
WG3258188-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	15-JAN-20
BR-IC-N-WT								
Water								
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Bromide (Br)		1.58	1.59		mg/L	0.2	20	15-JAN-20
WG3258031-12	LCS							
Bromide (Br)			102.5		%		85-115	15-JAN-20
WG3258031-11	MB							
Bromide (Br)			<0.10		mg/L		0.1	15-JAN-20
WG3258031-15	MS	WG3258031-13						
Bromide (Br)			N/A	MS-B	%		-	15-JAN-20
CL-IC-N-WT								
Water								
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Chloride (Cl)		64.3	64.3		mg/L	0.0	20	15-JAN-20
WG3258031-12	LCS							
Chloride (Cl)			101.8		%		90-110	15-JAN-20
WG3258031-11	MB							
Chloride (Cl)			<0.50		mg/L		0.5	15-JAN-20
WG3258031-15	MS	WG3258031-13						
Chloride (Cl)			99.2		%		75-125	15-JAN-20
CN-TOT-WT								
Water								
Batch	R4969947							
WG3257354-10	DUP	L2404819-1						
Cyanide, Total		0.0143	0.0140		mg/L	2.0	20	14-JAN-20
WG3257354-8	LCS							
Cyanide, Total			88.1		%		80-120	14-JAN-20
WG3257354-7	MB							
Cyanide, Total			<0.0020		mg/L		0.002	14-JAN-20
WG3257354-9	MS	L2404819-1						
Cyanide, Total			79.5		%		70-130	14-JAN-20
COD-T-WT								
Water								



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
COD-T-WT								
	Water							
Batch	R4973616							
WG3260748-3	DUP	L2405154-1						
COD		13	17	J	mg/L	3	20	21-JAN-20
WG3260748-2	LCS		101.5		%		85-115	21-JAN-20
COD								
WG3260748-1	MB		<10		mg/L		10	21-JAN-20
COD								
WG3260748-4	MS	L2405154-1	98.1		%		75-125	21-JAN-20
COD								
CR-CR6-IC-WT								
	Water							
Batch	R4969769							
WG3257918-4	DUP	WG3257918-3						
Chromium, Hexavalent		0.00073	0.00069		mg/L	6.7	20	15-JAN-20
WG3257918-2	LCS		102.2		%		80-120	15-JAN-20
Chromium, Hexavalent								
WG3257918-1	MB		<0.00050		mg/L		0.0005	15-JAN-20
Chromium, Hexavalent								
WG3257918-5	MS	WG3257918-3	100.1		%		70-130	15-JAN-20
Chromium, Hexavalent								
DOC-WT								
	Water							
Batch	R4972366							
WG3257705-3	DUP	L2404765-1						
Dissolved Organic Carbon		3.10	3.09		mg/L	0.3	20	16-JAN-20
WG3257705-2	LCS		103.2		%		80-120	16-JAN-20
Dissolved Organic Carbon								
WG3257705-1	MB		<0.50		mg/L		0.5	16-JAN-20
Dissolved Organic Carbon								
WG3257705-4	MS	L2404765-1	111.3		%		70-130	16-JAN-20
Dissolved Organic Carbon								
EC-WT								
	Water							
Batch	R4971580							
WG3258188-4	DUP	WG3258188-3						
Conductivity		902	903		umhos/cm	0.1	10	15-JAN-20
WG3258188-2	LCS		105.7		%		90-110	15-JAN-20
Conductivity								
WG3258188-1	MB		<3.0		umhos/cm		3	15-JAN-20
Conductivity								
F-IC-N-WT								
	Water							



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WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Fluoride (F)		0.496	0.490		mg/L	1.3	20	15-JAN-20
WG3258031-12	LCS							
Fluoride (F)			102.0		%		90-110	15-JAN-20
WG3258031-11	MB							
Fluoride (F)			<0.020		mg/L		0.02	15-JAN-20
WG3258031-15	MS	WG3258031-13						
Fluoride (F)			98.8		%		75-125	15-JAN-20
HG-T-CVAA-WT		Water						
Batch	R4969609							
WG3257970-3	DUP	L2404896-1						
Mercury (Hg)-Total		0.0000065	0.0000068		mg/L	4.5	20	15-JAN-20
WG3257970-2	LCS							
Mercury (Hg)-Total			99.6		%		80-120	15-JAN-20
WG3257970-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	15-JAN-20
WG3257970-4	MS	L2405079-1						
Mercury (Hg)-Total			113.2		%		70-130	15-JAN-20
MET-T-CCMS-WT		Water						
Batch	R4969649							
WG3257765-4	DUP	WG3257765-3						
Aluminum (Al)-Total		0.351	0.352		mg/L	0.3	20	15-JAN-20
Antimony (Sb)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JAN-20
Arsenic (As)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JAN-20
Barium (Ba)-Total		0.0397	0.0395		mg/L	0.5	20	15-JAN-20
Beryllium (Be)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JAN-20
Bismuth (Bi)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	15-JAN-20
Boron (B)-Total		0.27	0.27		mg/L	1.2	20	15-JAN-20
Cadmium (Cd)-Total		0.000075	0.000077		mg/L	2.4	20	15-JAN-20
Calcium (Ca)-Total		387	369		mg/L	4.8	20	15-JAN-20
Cobalt (Co)-Total		0.0027	0.0027		mg/L	1.8	20	15-JAN-20
Copper (Cu)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-JAN-20
Iron (Fe)-Total		0.61	0.59		mg/L	3.8	20	15-JAN-20
Lead (Pb)-Total		0.00270	0.00267		mg/L	1.2	20	15-JAN-20
Magnesium (Mg)-Total		218	221		mg/L	1.3	20	15-JAN-20
Manganese (Mn)-Total		0.258	0.259		mg/L	0.4	20	15-JAN-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4969649							
WG3257765-4	DUP	WG3257765-3						
Molybdenum (Mo)-Total		0.00531	0.00474		mg/L	11	20	15-JAN-20
Nickel (Ni)-Total		0.0197	0.0199		mg/L	1.1	20	15-JAN-20
Potassium (K)-Total		15.5	15.7		mg/L	1.4	20	15-JAN-20
Selenium (Se)-Total		0.00053	0.00056		mg/L	5.6	20	15-JAN-20
Silicon (Si)-Total		2.4	2.3		mg/L	1.7	20	15-JAN-20
Silver (Ag)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	15-JAN-20
Sodium (Na)-Total		149	149		mg/L	0.3	20	15-JAN-20
Strontium (Sr)-Total		5.47	4.83		mg/L	12	20	15-JAN-20
Thallium (Tl)-Total		0.00053	0.00051		mg/L	2.3	20	15-JAN-20
Tin (Sn)-Total		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JAN-20
Vanadium (V)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	15-JAN-20
Zinc (Zn)-Total		0.050	0.050		mg/L	0.5	20	15-JAN-20
WG3257765-2	LCS							
Aluminum (Al)-Total			100.3		%		80-120	15-JAN-20
Antimony (Sb)-Total			98.1		%		80-120	15-JAN-20
Arsenic (As)-Total			97.7		%		80-120	15-JAN-20
Barium (Ba)-Total			98.3		%		80-120	15-JAN-20
Beryllium (Be)-Total			90.7		%		80-120	15-JAN-20
Bismuth (Bi)-Total			93.7		%		80-120	15-JAN-20
Boron (B)-Total			89.2		%		80-120	15-JAN-20
Cadmium (Cd)-Total			96.9		%		80-120	15-JAN-20
Calcium (Ca)-Total			93.2		%		80-120	15-JAN-20
Cobalt (Co)-Total			99.3		%		80-120	15-JAN-20
Copper (Cu)-Total			97.5		%		80-120	15-JAN-20
Iron (Fe)-Total			104.0		%		80-120	15-JAN-20
Lead (Pb)-Total			93.9		%		80-120	15-JAN-20
Magnesium (Mg)-Total			107.7		%		80-120	15-JAN-20
Manganese (Mn)-Total			97.9		%		80-120	15-JAN-20
Molybdenum (Mo)-Total			91.2		%		80-120	15-JAN-20
Nickel (Ni)-Total			98.2		%		80-120	15-JAN-20
Potassium (K)-Total			99.8		%		80-120	15-JAN-20
Selenium (Se)-Total			94.5		%		80-120	15-JAN-20
Silicon (Si)-Total			102.7		%		60-140	15-JAN-20



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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4969649							
WG3257765-2	LCS							
Silver (Ag)-Total			90.4		%		80-120	15-JAN-20
Sodium (Na)-Total			103.8		%		80-120	15-JAN-20
Strontium (Sr)-Total			95.2		%		80-120	15-JAN-20
Thallium (Tl)-Total			94.9		%		80-120	15-JAN-20
Tin (Sn)-Total			90.0		%		80-120	15-JAN-20
Vanadium (V)-Total			100.5		%		80-120	15-JAN-20
Zinc (Zn)-Total			95.2		%		80-120	15-JAN-20
WG3257765-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	15-JAN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	15-JAN-20
Boron (B)-Total			<0.010		mg/L		0.01	15-JAN-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	15-JAN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	15-JAN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Copper (Cu)-Total			<0.0010		mg/L		0.001	15-JAN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	15-JAN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	15-JAN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	15-JAN-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	15-JAN-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	15-JAN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	15-JAN-20
Potassium (K)-Total			<0.050		mg/L		0.05	15-JAN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	15-JAN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	15-JAN-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	15-JAN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	15-JAN-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	15-JAN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	15-JAN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	15-JAN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-JAN-20



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Client: GHD Limited (Waterloo)
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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4969649							
WG3257765-1	MB							
Zinc (Zn)-Total			<0.0030		mg/L		0.003	15-JAN-20
WG3257765-5	MS	WG3257765-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	15-JAN-20
Antimony (Sb)-Total			89.5		%		70-130	15-JAN-20
Arsenic (As)-Total			97.1		%		70-130	15-JAN-20
Barium (Ba)-Total			N/A	MS-B	%		-	15-JAN-20
Beryllium (Be)-Total			89.6		%		70-130	15-JAN-20
Bismuth (Bi)-Total			89.1		%		70-130	15-JAN-20
Boron (B)-Total			N/A	MS-B	%		-	15-JAN-20
Cadmium (Cd)-Total			93.1		%		70-130	15-JAN-20
Calcium (Ca)-Total			N/A	MS-B	%		-	15-JAN-20
Cobalt (Co)-Total			93.3		%		70-130	15-JAN-20
Copper (Cu)-Total			88.1		%		70-130	15-JAN-20
Iron (Fe)-Total			N/A	MS-B	%		-	15-JAN-20
Lead (Pb)-Total			89.8		%		70-130	15-JAN-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	15-JAN-20
Manganese (Mn)-Total			N/A	MS-B	%		-	15-JAN-20
Molybdenum (Mo)-Total			83.7		%		70-130	15-JAN-20
Nickel (Ni)-Total			88.9		%		70-130	15-JAN-20
Potassium (K)-Total			N/A	MS-B	%		-	15-JAN-20
Selenium (Se)-Total			98.2		%		70-130	15-JAN-20
Silicon (Si)-Total			N/A	MS-B	%		-	15-JAN-20
Silver (Ag)-Total			86.6		%		70-130	15-JAN-20
Sodium (Na)-Total			N/A	MS-B	%		-	15-JAN-20
Strontium (Sr)-Total			N/A	MS-B	%		-	15-JAN-20
Thallium (Tl)-Total			89.1		%		70-130	15-JAN-20
Tin (Sn)-Total			87.0		%		70-130	15-JAN-20
Vanadium (V)-Total			98.3		%		70-130	15-JAN-20
Zinc (Zn)-Total			N/A	MS-B	%		-	15-JAN-20
NH3-F-WT								
	Water							
Batch	R4969875							
WG3257884-3	DUP	L2405007-1						
Ammonia, Total (as N)		1.07	1.07		mg/L	0.2	20	15-JAN-20
WG3257884-2	LCS							



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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT		Water						
Batch	R4969875							
WG3257884-2	LCS							
Ammonia, Total (as N)			101.2		%		85-115	15-JAN-20
WG3257884-1	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	15-JAN-20
WG3257884-4	MS	L2405007-1						
Ammonia, Total (as N)			N/A	MS-B	%		-	15-JAN-20
NO2-IC-WT		Water						
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-JAN-20
WG3258031-12	LCS							
Nitrite (as N)			100.8		%		90-110	15-JAN-20
WG3258031-11	MB							
Nitrite (as N)			<0.010		mg/L		0.01	15-JAN-20
WG3258031-15	MS	WG3258031-13						
Nitrite (as N)			99.6		%		75-125	15-JAN-20
NO3-IC-WT		Water						
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Nitrate (as N)		0.194	0.196		mg/L	0.8	20	15-JAN-20
WG3258031-12	LCS							
Nitrate (as N)			101.1		%		90-110	15-JAN-20
WG3258031-11	MB							
Nitrate (as N)			<0.020		mg/L		0.02	15-JAN-20
WG3258031-15	MS	WG3258031-13						
Nitrate (as N)			98.7		%		75-125	15-JAN-20
P-T-COL-WT		Water						
Batch	R4972332							
WG3258036-3	DUP	L2405196-1						
Phosphorus, Total		4.32	4.29		mg/L	0.7	20	17-JAN-20
WG3258036-2	LCS							
Phosphorus, Total			102.2		%		80-120	17-JAN-20
WG3258036-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	17-JAN-20
WG3258036-4	MS	L2405196-1						
Phosphorus, Total			N/A	MS-B	%		-	17-JAN-20
PH-WT		Water						



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT		Water						
Batch	R4971580							
WG3258188-4	DUP	WG3258188-3						
pH		8.40	8.33	J	pH units	0.07	0.2	15-JAN-20
WG3258188-2	LCS		7.00		pH units		6.9-7.1	15-JAN-20
PHENOLS-4AAP-WT		Water						
Batch	R4969951							
WG3258133-3	DUP	L2404513-1						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	15-JAN-20
WG3258133-2	LCS		97.4		%		85-115	15-JAN-20
Phenols (4AAP)								
WG3258133-1	MB		<0.0010		mg/L		0.001	15-JAN-20
Phenols (4AAP)								
WG3258133-4	MS	L2404513-1	91.2		%		75-125	15-JAN-20
Phenols (4AAP)								
SO4-IC-N-WT		Water						
Batch	R4971804							
WG3258031-14	DUP	WG3258031-13						
Sulfate (SO4)		137	137		mg/L	0.0	20	15-JAN-20
WG3258031-12	LCS		101.9		%		90-110	15-JAN-20
Sulfate (SO4)								
WG3258031-11	MB		<0.30		mg/L		0.3	15-JAN-20
Sulfate (SO4)								
WG3258031-15	MS	WG3258031-13	N/A	MS-B	%		-	15-JAN-20
Sulfate (SO4)								
SOLIDS-TDS-WT		Water						
Batch	R4973211							
WG3258823-3	DUP	L2404608-1						
Total Dissolved Solids		801	810		mg/L	1.2	20	16-JAN-20
WG3258823-2	LCS		97.2		%		85-115	16-JAN-20
Total Dissolved Solids								
WG3258823-1	MB		<10		mg/L		10	16-JAN-20
Total Dissolved Solids								
SOLIDS-TSS-WT		Water						
Batch	R4972921							
WG3259205-3	DUP	L2405696-1						
Total Suspended Solids		767	687		mg/L	11	20	20-JAN-20
WG3259205-2	LCS							



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-WT		Water						
Batch	R4972921							
WG3259205-2	LCS							
Total Suspended Solids			99.6		%		85-115	20-JAN-20
WG3259205-1	MB							
Total Suspended Solids			<2.0		mg/L		2	20-JAN-20
TKN-WT		Water						
Batch	R4972449							
WG3258096-3	DUP	L2405076-38						
Total Kjeldahl Nitrogen		0.41	0.34		mg/L	19	20	17-JAN-20
WG3258096-2	LCS							
Total Kjeldahl Nitrogen			103.0		%		75-125	17-JAN-20
WG3258096-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	17-JAN-20
WG3258096-4	MS	L2405076-38						
Total Kjeldahl Nitrogen			104.5		%		70-130	17-JAN-20
VOC-ROU-HS-WT		Water						
Batch	R4969286							
WG3251196-4	DUP	WG3251196-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-JAN-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	15-JAN-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Carbon tetrachloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4969286							
WG3251196-4	DUP	WG3251196-3						
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JAN-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-JAN-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JAN-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JAN-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JAN-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JAN-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JAN-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JAN-20
WG3251196-1	LCS							
1,1,1,2-Tetrachloroethane			92.6		%		70-130	15-JAN-20
1,1,2,2-Tetrachloroethane			82.0		%		70-130	15-JAN-20
1,1,1-Trichloroethane			96.7		%		70-130	15-JAN-20
1,1,2-Trichloroethane			83.4		%		70-130	15-JAN-20
1,2-Dibromoethane			81.6		%		70-130	15-JAN-20
1,1-Dichloroethane			93.3		%		70-130	15-JAN-20
1,1-Dichloroethylene			97.8		%		70-130	15-JAN-20
1,2-Dichlorobenzene			92.9		%		70-130	15-JAN-20
1,2-Dichloroethane			89.9		%		70-130	15-JAN-20



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 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4969286							
WG3251196-1	LCS							
1,2-Dichloropropane			90.4		%		70-130	15-JAN-20
1,3-Dichlorobenzene			97.2		%		70-130	15-JAN-20
1,4-Dichlorobenzene			96.6		%		70-130	15-JAN-20
Acetone			86.1		%		60-140	15-JAN-20
Benzene			95.0		%		70-130	15-JAN-20
Bromodichloromethane			91.4		%		70-130	15-JAN-20
Bromoform			80.0		%		70-130	15-JAN-20
Bromomethane			89.9		%		60-140	15-JAN-20
Carbon tetrachloride			98.3		%		70-130	15-JAN-20
Chlorobenzene			91.7		%		70-130	15-JAN-20
Chloroethane			109.9		%		70-130	15-JAN-20
Chloroform			91.5		%		70-130	15-JAN-20
cis-1,2-Dichloroethylene			87.3		%		70-130	15-JAN-20
cis-1,3-Dichloropropene			90.6		%		70-130	15-JAN-20
Dibromochloromethane			87.1		%		70-130	15-JAN-20
Dichlorodifluoromethane			112.8		%		50-140	15-JAN-20
Dichloromethane			87.7		%		70-130	15-JAN-20
Ethylbenzene			95.8		%		70-130	15-JAN-20
m+p-Xylenes			96.4		%		70-130	15-JAN-20
Methyl Ethyl Ketone			76.6		%		60-140	15-JAN-20
Methyl Isobutyl Ketone			78.5		%		50-150	15-JAN-20
n-Hexane			97.2		%		70-130	15-JAN-20
MTBE			93.1		%		70-130	15-JAN-20
o-Xylene			93.3		%		70-130	15-JAN-20
Styrene			95.2		%		70-130	15-JAN-20
Tetrachloroethylene			99.2		%		70-130	15-JAN-20
Toluene			96.2		%		70-130	15-JAN-20
trans-1,2-Dichloroethylene			95.8		%		70-130	15-JAN-20
trans-1,3-Dichloropropene			95.5		%		70-130	15-JAN-20
Trichloroethylene			94.7		%		70-130	15-JAN-20
Trichlorofluoromethane			100.3		%		60-140	15-JAN-20
Vinyl chloride			115.3		%		60-140	15-JAN-20
WG3251196-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JAN-20



Quality Control Report

Workorder: L2405226

Report Date: 21-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4969286							
WG3251196-2 MB								
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JAN-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	15-JAN-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	15-JAN-20
1,2-Dibromoethane			<0.20		ug/L		0.2	15-JAN-20
1,1-Dichloroethane			<0.50		ug/L		0.5	15-JAN-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	15-JAN-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	15-JAN-20
1,2-Dichloroethane			<0.50		ug/L		0.5	15-JAN-20
1,2-Dichloropropane			<0.50		ug/L		0.5	15-JAN-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	15-JAN-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	15-JAN-20
Acetone			<20		ug/L		20	15-JAN-20
Benzene			<0.50		ug/L		0.5	15-JAN-20
Bromodichloromethane			<1.0		ug/L		1	15-JAN-20
Bromoform			<1.0		ug/L		1	15-JAN-20
Bromomethane			<0.50		ug/L		0.5	15-JAN-20
Carbon tetrachloride			<0.50		ug/L		0.5	15-JAN-20
Chlorobenzene			<0.50		ug/L		0.5	15-JAN-20
Chloroethane			<1.0		ug/L		1	15-JAN-20
Chloroform			<1.0		ug/L		1	15-JAN-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JAN-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JAN-20
Dibromochloromethane			<1.0		ug/L		1	15-JAN-20
Dichlorodifluoromethane			<1.0		ug/L		1	15-JAN-20
Dichloromethane			<2.0		ug/L		2	15-JAN-20
Ethylbenzene			<0.50		ug/L		0.5	15-JAN-20
m+p-Xylenes			<0.40		ug/L		0.4	15-JAN-20
Methyl Ethyl Ketone			<20		ug/L		20	15-JAN-20
Methyl Isobutyl Ketone			<20		ug/L		20	15-JAN-20
n-Hexane			<0.50		ug/L		0.5	15-JAN-20
MTBE			<0.50		ug/L		0.5	15-JAN-20
o-Xylene			<0.30		ug/L		0.3	15-JAN-20
Styrene			<0.50		ug/L		0.5	15-JAN-20



Quality Control Report

Workorder: L2405226

Report Date: 21-JAN-20

Page 16 of 18

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4969286							
WG3251196-2 MB								
Tetrachloroethylene			<0.50		ug/L		0.5	15-JAN-20
Toluene			<0.50		ug/L		0.5	15-JAN-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JAN-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JAN-20
Trichloroethylene			<0.50		ug/L		0.5	15-JAN-20
Trichlorofluoromethane			<1.0		ug/L		1	15-JAN-20
Vinyl chloride			<0.50		ug/L		0.5	15-JAN-20
Surrogate: 1,4-Difluorobenzene			103.1		%		70-130	15-JAN-20
Surrogate: 4-Bromofluorobenzene			102.5		%		70-130	15-JAN-20
WG3251196-5 MS		WG3251196-3						
1,1,1,2-Tetrachloroethane			93.2		%		50-150	15-JAN-20
1,1,1,2,2-Tetrachloroethane			84.9		%		50-150	15-JAN-20
1,1,1-Trichloroethane			96.5		%		50-150	15-JAN-20
1,1,2-Trichloroethane			85.3		%		50-150	15-JAN-20
1,2-Dibromoethane			83.7		%		50-150	15-JAN-20
1,1-Dichloroethane			95.2		%		50-150	15-JAN-20
1,1-Dichloroethylene			96.9		%		50-150	15-JAN-20
1,2-Dichlorobenzene			92.7		%		50-150	15-JAN-20
1,2-Dichloroethane			93.9		%		50-150	15-JAN-20
1,2-Dichloropropane			92.7		%		50-150	15-JAN-20
1,3-Dichlorobenzene			95.1		%		50-150	15-JAN-20
1,4-Dichlorobenzene			94.6		%		50-150	15-JAN-20
Acetone			95.4		%		50-150	15-JAN-20
Benzene			96.0		%		50-150	15-JAN-20
Bromodichloromethane			93.9		%		50-150	15-JAN-20
Bromoform			82.7		%		50-150	15-JAN-20
Bromomethane			85.9		%		50-150	15-JAN-20
Carbon tetrachloride			97.6		%		50-150	15-JAN-20
Chlorobenzene			91.6		%		50-150	15-JAN-20
Chloroethane			107.9		%		50-150	15-JAN-20
Chloroform			93.0		%		50-150	15-JAN-20
cis-1,2-Dichloroethylene			88.7		%		50-150	15-JAN-20
cis-1,3-Dichloropropene			90.3		%		50-150	15-JAN-20
Dibromochloromethane			88.7		%		50-150	15-JAN-20



Quality Control Report

Workorder: L2405226

Report Date: 21-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4969286							
WG3251196-5 MS		WG3251196-3						
Dichlorodifluoromethane			102.5		%		50-150	15-JAN-20
Dichloromethane			90.2		%		50-150	15-JAN-20
Ethylbenzene			94.2		%		50-150	15-JAN-20
m+p-Xylenes			94.7		%		50-150	15-JAN-20
Methyl Ethyl Ketone			76.6		%		50-150	15-JAN-20
Methyl Isobutyl Ketone			83.3		%		50-150	15-JAN-20
n-Hexane			94.4		%		50-150	15-JAN-20
MTBE			93.1		%		50-150	15-JAN-20
o-Xylene			92.5		%		50-150	15-JAN-20
Styrene			93.4		%		50-150	15-JAN-20
Tetrachloroethylene			94.6		%		50-150	15-JAN-20
Toluene			95.1		%		50-150	15-JAN-20
trans-1,2-Dichloroethylene			95.0		%		50-150	15-JAN-20
trans-1,3-Dichloropropene			93.1		%		50-150	15-JAN-20
Trichloroethylene			93.7		%		50-150	15-JAN-20
Trichlorofluoromethane			97.5		%		50-150	15-JAN-20
Vinyl chloride			110.2		%		50-150	15-JAN-20

Quality Control Report

Workorder: L2405226

Report Date: 21-JAN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
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.



L2405226-COFC

COC Number: 14 -

Page 1 of 1

Canada Toll Free: 1 800 668 9878

Report To Company: GHD LIMITED Contact: Jennifer Balkwill Address: 651 Colby Drive, Waterloo, Ontario N2V 1C2 Phone: 519-884-0510		Acct#13791	Report Format / Distribution 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"/> 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 <u>Jennifer.Balkwill@ghd.com</u> Email 2 See PO			Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests) R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days) P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge Specify Date Required for E2,E or P:																																																																																
Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Copy of Invoice with Report <input type="checkbox"/> Yes <input type="checkbox"/> No Company: GHD LIMITED Contact: Jennifer Balkwill		Invoice Distribution Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> FAX Email 1 or Fax <u>Jennifer.Balkwill@ghd.com</u> Email 2			Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below																																																																																	
Project Information ALS Quote #: Job #: 44985 PO / AFE: 73506479 LSD:		ALS Contact: Rick H Sampler:			<table border="1"> <thead> <tr> <th>ALK, Conductivity, pH, TDS, TSS, Phenols</th> <th>Br, NO2, NO3, SO4, Cl, F (ANIONS-IC-6-WT)</th> <th>DOC (C-DIS-ORG-WT), COD, TKN, TP</th> <th>Total CN (CN-TOT-WT)</th> <th>Un-ionized NH3 (ETL-NH3-UNION-CL-WT)</th> <th>Total Metals (MET-T-M5-WT-WT-44985-Metals)</th> <th>Total Mercury (HG-T-CVAA-WT)</th> <th>Total Cr 6+ (CR-CR6-IC-WT), Hardness calc</th> <th>VOCs (VOC-ROU-HS-WT-WT-44985-VOC)</th> <th>SVOCs (SVOC-44985-P-WT)</th> <th>Nutrients</th> <th>CLIENT SUPPLIED TEMPERATURE **</th> <th>CLIENT SUPPLIED pH **</th> <th>Number of Containers</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> <td>6.6</td> <td>7.7</td> <td>12</td> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> <td>7.2</td> <td>7.8</td> <td>12</td> </tr> <tr> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td>R</td> <td></td> <td>6.0</td> <td>7.6</td> <td>12</td> </tr> </tbody> </table>												ALK, Conductivity, pH, TDS, TSS, Phenols	Br, NO2, NO3, SO4, Cl, F (ANIONS-IC-6-WT)	DOC (C-DIS-ORG-WT), COD, TKN, TP	Total CN (CN-TOT-WT)	Un-ionized NH3 (ETL-NH3-UNION-CL-WT)	Total Metals (MET-T-M5-WT-WT-44985-Metals)	Total Mercury (HG-T-CVAA-WT)	Total Cr 6+ (CR-CR6-IC-WT), Hardness calc	VOCs (VOC-ROU-HS-WT-WT-44985-VOC)	SVOCs (SVOC-44985-P-WT)	Nutrients	CLIENT SUPPLIED TEMPERATURE **	CLIENT SUPPLIED pH **	Number of Containers															R	R	R	R	R	R	R	R	R	R		6.6	7.7	12	R	R	R	R	R	R	R	R	R	R		7.2	7.8	12	R	R	R	R	R	R	R	R	R	R		6.0	7.6	12
ALK, Conductivity, pH, TDS, TSS, Phenols	Br, NO2, NO3, SO4, Cl, F (ANIONS-IC-6-WT)	DOC (C-DIS-ORG-WT), COD, TKN, TP	Total CN (CN-TOT-WT)	Un-ionized NH3 (ETL-NH3-UNION-CL-WT)	Total Metals (MET-T-M5-WT-WT-44985-Metals)	Total Mercury (HG-T-CVAA-WT)	Total Cr 6+ (CR-CR6-IC-WT), Hardness calc	VOCs (VOC-ROU-HS-WT-WT-44985-VOC)	SVOCs (SVOC-44985-P-WT)	Nutrients	CLIENT SUPPLIED TEMPERATURE **	CLIENT SUPPLIED pH **	Number of Containers																																																																									
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ALS Lab Work Order # (lab use only) L2405226WH		<table border="1"> <thead> <tr> <th>ALS Sample # (lab use only)</th> <th>Sample Identification and/or Coordinates (This description will appear on the report)</th> <th>Date (dd-mmm-yy)</th> <th>Time (hh:mm)</th> <th>Sample Type</th> </tr> </thead> <tbody> <tr> <td></td> <td>EQ Pond Discharge</td> <td>13-Jan-20</td> <td>1200</td> <td>Water</td> </tr> <tr> <td></td> <td>West Storm Water Pond</td> <td>13-Jan-20</td> <td>1215</td> <td>Water</td> </tr> <tr> <td></td> <td>ERP - East Storm Water Pond</td> <td>13-Jan-20</td> <td>1230</td> <td>Water</td> </tr> </tbody> </table>												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		EQ Pond Discharge	13-Jan-20	1200	Water		West Storm Water Pond	13-Jan-20	1215	Water		ERP - East Storm Water Pond	13-Jan-20	1230	Water																																																					
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Drinking Water (DW) Samples¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Special Instructions / Specify Criteria to add on report (client use) **Please fill in Client Supplied temperature and pH for Unionized NH3 calculation**			SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input type="checkbox"/> SIP Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling initiated <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 25.6 FINAL COOLER TEMPERATURES °C:																																																																																	
SHIPMENT RELEASE (client use) Released by: <u>[Signature]</u> Date: Jan 13/20 Time: 1500		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Date: Time:			FINAL SHIPMENT RECEPTION (lab use only) Received by: <u>[Signature]</u> Date: 14-JAN-20 Time: 9.15																																																																																	



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 15-JAN-20
Report Date: 17-JAN-20 10:48 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2405731
Project P.O. #: NOT SUBMITTED
Job Reference: 44985
C of C Numbers:
Legal Site Desc:


Kieran Tordoff
Account Manager

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ADDRESS: 9450 17 Avenue NW, Edmonton, AB T6N 1M9 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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
L2405731-1 EQ POND DISCHARGE Sampled By: CLIENT on 13-JAN-20 @ 12:00 Matrix: WATER							
Microtox Physical Tests							
Turbidity	N/A				16-JAN-20	16-JAN-20	R4971998
Colour	Colourless				16-JAN-20	16-JAN-20	R4971998
Clarification	None				16-JAN-20	16-JAN-20	R4971998
Initial pH	8.0		0.10	pH	16-JAN-20	16-JAN-20	R4971998
Final pH	8.0		0.10	pH	16-JAN-20	16-JAN-20	R4971998
Lab Treatment	None				16-JAN-20	16-JAN-20	R4971998
Microtox Original							
EC50 (15min) Original	>100		1.0	%	16-JAN-20	16-JAN-20	R4971998
EC20 (15min) Original	>100		1.0	%	16-JAN-20	16-JAN-20	R4971998
EC50 (5min) Original	>100		1.0	%	16-JAN-20	16-JAN-20	R4971998
EC20 (5min) Original	>100		1.0	%	16-JAN-20	16-JAN-20	R4971998
Interpretation Original	NON TOXIC				16-JAN-20	16-JAN-20	R4971998

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MICROTOX-ORG-ED	Water	Microtox Original	ERCB Directive 050
<p>Light output of luminescent bacteria is measured after they have been challenged by a sample of unknown toxicity, and compared to the light output of a control reagent blank. The difference in light output is attributed to the effect of the sample on the organisms, and the degree of light loss indicates metabolic inhibition and the degree of toxicity of the sample to the bacteria. EC50(5) and EC50(15) values are reported, and refer to the effective concentration of the sample that caused a 50% decrease in the light output in 5 and 15 minutes.</p>			
MICROTOX-PHYSICAL-ED	Water	Microtox Physical Tests	ERCB Directive 050

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, 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.



Environmental

Quality Control Report

Workorder: L2405731

Report Date: 17-JAN-20

Page 1 of 2

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MICROTOX-ORG-ED								
	Water							
Batch	R4971998							
WG3258738-2 CRM		PHENOL_ED						
EC50 (5min) Original			14.7		mg/L		13-26	16-JAN-20
WG3258738-3 CRM		PHENOL_ED						
EC50 (5min) Original			14.0		mg/L		13-26	16-JAN-20
WG3258738-4 DUP		L2405731-1						
EC50 (15min) Original		>100	>100	RPD-NA	%	N/A		16-JAN-20
EC20 (15min) Original		>100	>100	RPD-NA	%	N/A		16-JAN-20
EC50 (5min) Original		>100	>100	RPD-NA	%	N/A		16-JAN-20
EC20 (5min) Original		>100	>100	RPD-NA	%	N/A		16-JAN-20
WG3258738-1 MB								
EC50 (15min) Original			PASS					16-JAN-20
EC20 (15min) Original			PASS					16-JAN-20
EC50 (5min) Original			PASS					16-JAN-20
EC20 (5min) Original			PASS					16-JAN-20

Quality Control Report

Workorder: L2405731

Report Date: 17-JAN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 2 of 2

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
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.



www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2405731-COFC

COC Number: 14 -

Page 1 of 1

Report To Company: GHD LIMITED Contact: Laura Ermeta Address: 455 Phillip St N2L 3X2 Phone: 519-884-0510		Acct#13791		Report Format / Dist		Select Report Format: <input 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"/> 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 laura.ermeta@ghd.com Email 2 See PO		R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days) P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge	
Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Copy of Invoice with Report <input type="checkbox"/> Yes <input type="checkbox"/> No Company: GHD LIMITED Contact: Laura Ermeta		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> FAX Email 1 or Fax laura.ermeta@ghd.com Email 2		Specify Date Required for E2,E or P:		Analysis Request		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below	
Project Information ALS Quote #: Job #: 44985 PO / AFE: LSD:		Oil and Gas Required Fields (client use) Approver ID: GL Account: Activity Code: Location:		Cost Center: Routing Code:		MICROTOX (MICROTOX-ORG-ED) (MICROTOX-PHYSICAL-ED)		Number of Containers	
ALS Lab Work Order # (lab use only) L2405731		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					
	EQ Pond Discharge	13-Jan-20	12:00	Water	R				2
Drinking Water (DW) Samples ¹ (client use) Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Special Instructions / Specify Criteria to add on report (client Use) Please send to ALS Edmonton ASAP for analysis (short HT)		SAMPLE CONDITION AS RECEIVED (lab use only) Frozen <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Ice packs Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input checked="" type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: 9.5 FINAL COOLER TEMPERATURES °C:		INITIAL SHIPMENT RECEPTION (lab use only) Received by: AL Date: Jan 15 Time: 9:25		FINAL SHIPMENT RECEPTION (lab use only) Received by: _____ Date: _____ Time: _____	
Released by: [Signature] Date: Jan 13/20 Time: 1500		Received by: AL Date: Jan 15 Time: 9:25		Released by: _____ Date: _____ Time: _____		Date: _____ Time: _____			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-PLS-0226a v09 Form04 January 2014

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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 21-JAN-20
Report Date: 22-JAN-20 10:27 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2407471
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
L2407471-1 INFLUENT							
Sampled By: CLIENT on 20-JAN-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		22-JAN-20	R4973959
Benzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Bromodichloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Bromoform	<1.0		1.0	ug/L		22-JAN-20	R4973959
Bromomethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Carbon Disulfide	<1.0		1.0	ug/L		22-JAN-20	R4973959
Carbon tetrachloride	<0.50		0.50	ug/L		22-JAN-20	R4973959
Chlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dibromochloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloroethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloroform	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
1,2-Dibromoethane	<0.20		0.20	ug/L		22-JAN-20	R4973959
1,2-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,3-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,4-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dichlorodifluoromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
1,1-Dichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,2-Dichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dichloromethane	<2.0		2.0	ug/L		22-JAN-20	R4973959
1,2-Dichloropropane	<0.50		0.50	ug/L		22-JAN-20	R4973959
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JAN-20	R4973959
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JAN-20	R4973959
Ethylbenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
n-Hexane	<0.50		0.50	ug/L		22-JAN-20	R4973959
2-Hexanone	<20		20	ug/L		22-JAN-20	R4973959
Methyl Ethyl Ketone	<20		20	ug/L		22-JAN-20	R4973959
Methyl Isobutyl Ketone	<20		20	ug/L		22-JAN-20	R4973959
MTBE	<0.50		0.50	ug/L		22-JAN-20	R4973959
Styrene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Tetrachloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Toluene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,1-Trichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,2-Trichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Trichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Trichlorofluoromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959

* 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
L2407471-1 INFLUENT Sampled By: CLIENT on 20-JAN-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		22-JAN-20	R4973959
o-Xylene	<0.30		0.30	ug/L		22-JAN-20	R4973959
m+p-Xylenes	<0.40		0.40	ug/L		22-JAN-20	R4973959
Xylenes (Total)	<0.50		0.50	ug/L		22-JAN-20	
Surrogate: 4-Bromofluorobenzene	97.7		70-130	%		22-JAN-20	R4973959
Surrogate: 1,4-Difluorobenzene	102.4		70-130	%		22-JAN-20	R4973959
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		22-JAN-20	
L2407471-2 EQ POND Sampled By: CLIENT on 20-JAN-20 @ 08:30 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		22-JAN-20	R4973959
Benzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Bromodichloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Bromoform	<1.0		1.0	ug/L		22-JAN-20	R4973959
Bromomethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Carbon Disulfide	<1.0		1.0	ug/L		22-JAN-20	R4973959
Carbon tetrachloride	<0.50		0.50	ug/L		22-JAN-20	R4973959
Chlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dibromochloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloroethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloroform	<1.0		1.0	ug/L		22-JAN-20	R4973959
Chloromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
1,2-Dibromoethane	<0.20		0.20	ug/L		22-JAN-20	R4973959
1,2-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,3-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,4-Dichlorobenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dichlorodifluoromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
1,1-Dichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,2-Dichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Dichloromethane	<2.0		2.0	ug/L		22-JAN-20	R4973959
1,2-Dichloropropane	<0.50		0.50	ug/L		22-JAN-20	R4973959
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JAN-20	R4973959
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		22-JAN-20	R4973959
Ethylbenzene	<0.50		0.50	ug/L		22-JAN-20	R4973959
n-Hexane	<0.50		0.50	ug/L		22-JAN-20	R4973959
2-Hexanone	<20		20	ug/L		22-JAN-20	R4973959
Methyl Ethyl Ketone	<20		20	ug/L		22-JAN-20	R4973959

* 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
L2407471-2 EQ POND							
Sampled By: CLIENT on 20-JAN-20 @ 08:30							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		22-JAN-20	R4973959
MTBE	<0.50		0.50	ug/L		22-JAN-20	R4973959
Styrene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Tetrachloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Toluene	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,1-Trichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
1,1,2-Trichloroethane	<0.50		0.50	ug/L		22-JAN-20	R4973959
Trichloroethylene	<0.50		0.50	ug/L		22-JAN-20	R4973959
Trichlorofluoromethane	<1.0		1.0	ug/L		22-JAN-20	R4973959
Vinyl chloride	<0.50		0.50	ug/L		22-JAN-20	R4973959
o-Xylene	<0.30		0.30	ug/L		22-JAN-20	R4973959
m+p-Xylenes	<0.40		0.40	ug/L		22-JAN-20	R4973959
Xylenes (Total)	<0.50		0.50	ug/L		22-JAN-20	
Surrogate: 4-Bromofluorobenzene	96.9		70-130	%		22-JAN-20	R4973959
Surrogate: 1,4-Difluorobenzene	102.0		70-130	%		22-JAN-20	R4973959
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		22-JAN-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2407471

Report Date: 22-JAN-20

Page 1 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4973959							
WG3260719-4	DUP	WG3260719-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	22-JAN-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	22-JAN-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	22-JAN-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Carbon tetrachloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	22-JAN-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	22-JAN-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	22-JAN-20
Methyl Isobutyl Ketone		<20	<20		ug/L			22-JAN-20



Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4973959							
WG3260719-4	DUP	WG3260719-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	22-JAN-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	22-JAN-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	22-JAN-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	22-JAN-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	22-JAN-20
WG3260719-1	LCS							
1,1,1,2-Tetrachloroethane			96.4		%		70-130	21-JAN-20
1,1,2,2-Tetrachloroethane			105.0		%		70-130	21-JAN-20
1,1,1-Trichloroethane			92.0		%		70-130	21-JAN-20
1,1,2-Trichloroethane			100.7		%		70-130	21-JAN-20
1,2-Dibromoethane			101.4		%		70-130	21-JAN-20
1,1-Dichloroethane			92.6		%		70-130	21-JAN-20
1,1-Dichloroethylene			89.3		%		70-130	21-JAN-20
1,2-Dichlorobenzene			92.6		%		70-130	21-JAN-20
1,2-Dichloroethane			100.3		%		70-130	21-JAN-20
1,2-Dichloropropane			100.4		%		70-130	21-JAN-20
1,3-Dichlorobenzene			89.6		%		70-130	21-JAN-20
1,4-Dichlorobenzene			90.4		%		70-130	21-JAN-20
2-Hexanone			102.4		%		60-140	21-JAN-20
Acetone			104.5		%		60-140	21-JAN-20
Benzene			104.0		%		70-130	21-JAN-20
Bromodichloromethane			94.4		%		70-130	21-JAN-20
Bromoform			101.2		%		70-130	21-JAN-20
Bromomethane			90.9		%		60-140	21-JAN-20
Carbon Disulfide			97.7		%		70-130	21-JAN-20
Carbon tetrachloride			88.5		%		70-130	21-JAN-20



Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4973959							
WG3260719-1	LCS							
Chlorobenzene			98.8		%		70-130	21-JAN-20
Chloroethane			103.0		%		70-130	21-JAN-20
Chloroform			100.4		%		70-130	21-JAN-20
Chloromethane			98.0		%		60-140	21-JAN-20
cis-1,2-Dichloroethylene			90.3		%		70-130	21-JAN-20
cis-1,3-Dichloropropene			105.6		%		70-130	21-JAN-20
Dibromochloromethane			92.7		%		70-130	21-JAN-20
Dichlorodifluoromethane			84.2		%		50-140	21-JAN-20
Dichloromethane			95.7		%		70-130	21-JAN-20
Ethylbenzene			95.0		%		70-130	21-JAN-20
m+p-Xylenes			93.0		%		70-130	21-JAN-20
Methyl Ethyl Ketone			100.3		%		60-140	21-JAN-20
Methyl Isobutyl Ketone			106.6		%		50-150	21-JAN-20
n-Hexane			82.2		%		70-130	21-JAN-20
MTBE			91.8		%		70-130	21-JAN-20
o-Xylene			94.4		%		70-130	21-JAN-20
Styrene			98.5		%		70-130	21-JAN-20
Tetrachloroethylene			89.5		%		70-130	21-JAN-20
Toluene			96.2		%		70-130	21-JAN-20
trans-1,2-Dichloroethylene			89.4		%		70-130	21-JAN-20
trans-1,3-Dichloropropene			115.2		%		70-130	21-JAN-20
Trichloroethylene			89.1		%		70-130	21-JAN-20
Trichlorofluoromethane			87.0		%		60-140	21-JAN-20
Vinyl chloride			103.1		%		60-140	21-JAN-20
WG3260719-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	22-JAN-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	22-JAN-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	22-JAN-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	22-JAN-20
1,2-Dibromoethane			<0.20		ug/L		0.2	22-JAN-20
1,1-Dichloroethane			<0.50		ug/L		0.5	22-JAN-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	22-JAN-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	22-JAN-20
1,2-Dichloroethane			<0.50		ug/L		0.5	22-JAN-20



Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4973959							
WG3260719-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	22-JAN-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	22-JAN-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	22-JAN-20
2-Hexanone			<20		ug/L		20	22-JAN-20
Acetone			<20		ug/L		20	22-JAN-20
Benzene			<0.50		ug/L		0.5	22-JAN-20
Bromodichloromethane			<1.0		ug/L		1	22-JAN-20
Bromoform			<1.0		ug/L		1	22-JAN-20
Bromomethane			<0.50		ug/L		0.5	22-JAN-20
Carbon Disulfide			<1.0		ug/L		1	22-JAN-20
Carbon tetrachloride			<0.50		ug/L		0.5	22-JAN-20
Chlorobenzene			<0.50		ug/L		0.5	22-JAN-20
Chloroethane			<1.0		ug/L		1	22-JAN-20
Chloroform			<1.0		ug/L		1	22-JAN-20
Chloromethane			<1.0		ug/L		1	22-JAN-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	22-JAN-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	22-JAN-20
Dibromochloromethane			<1.0		ug/L		1	22-JAN-20
Dichlorodifluoromethane			<1.0		ug/L		1	22-JAN-20
Dichloromethane			<2.0		ug/L		2	22-JAN-20
Ethylbenzene			<0.50		ug/L		0.5	22-JAN-20
m+p-Xylenes			<0.40		ug/L		0.4	22-JAN-20
Methyl Ethyl Ketone			<20		ug/L		20	22-JAN-20
Methyl Isobutyl Ketone			<20		ug/L		20	22-JAN-20
n-Hexane			<0.50		ug/L		0.5	22-JAN-20
MTBE			<0.50		ug/L		0.5	22-JAN-20
o-Xylene			<0.30		ug/L		0.3	22-JAN-20
Styrene			<0.50		ug/L		0.5	22-JAN-20
Tetrachloroethylene			<0.50		ug/L		0.5	22-JAN-20
Toluene			<0.50		ug/L		0.5	22-JAN-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	22-JAN-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	22-JAN-20
Trichloroethylene			<0.50		ug/L		0.5	22-JAN-20



Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4973959							
WG3260719-2	MB							
Trichlorofluoromethane			<1.0		ug/L		1	22-JAN-20
Vinyl chloride			<0.50		ug/L		0.5	22-JAN-20
Surrogate: 1,4-Difluorobenzene			101.9		%		70-130	22-JAN-20
Surrogate: 4-Bromofluorobenzene			99.1		%		70-130	22-JAN-20
WG3260719-5	MS	WG3260719-3						
1,1,1,2-Tetrachloroethane			96.1		%		50-150	22-JAN-20
1,1,2,2-Tetrachloroethane			97.9		%		50-150	22-JAN-20
1,1,1-Trichloroethane			93.4		%		50-150	22-JAN-20
1,1,2-Trichloroethane			96.4		%		50-150	22-JAN-20
1,2-Dibromoethane			95.1		%		50-150	22-JAN-20
1,1-Dichloroethane			92.7		%		50-150	22-JAN-20
1,1-Dichloroethylene			86.8		%		50-150	22-JAN-20
1,2-Dichlorobenzene			93.2		%		50-150	22-JAN-20
1,2-Dichloroethane			95.2		%		50-150	22-JAN-20
1,2-Dichloropropane			98.9		%		50-150	22-JAN-20
1,3-Dichlorobenzene			91.4		%		50-150	22-JAN-20
1,4-Dichlorobenzene			91.3		%		50-150	22-JAN-20
2-Hexanone			87.0		%		50-150	22-JAN-20
Acetone			100.3		%		50-150	22-JAN-20
Benzene			104.2		%		50-150	22-JAN-20
Bromodichloromethane			93.5		%		50-150	22-JAN-20
Bromoform			94.5		%		50-150	22-JAN-20
Bromomethane			81.7		%		50-150	22-JAN-20
Carbon Disulfide			90.9		%		50-150	22-JAN-20
Carbon tetrachloride			90.3		%		50-150	22-JAN-20
Chlorobenzene			99.2		%		50-150	22-JAN-20
Chloroethane			96.5		%		50-150	22-JAN-20
Chloroform			100.7		%		50-150	22-JAN-20
Chloromethane			85.4		%		50-150	22-JAN-20
cis-1,2-Dichloroethylene			89.1		%		50-150	22-JAN-20
cis-1,3-Dichloropropene			96.3		%		50-150	22-JAN-20
Dibromochloromethane			89.1		%		50-150	22-JAN-20
Dichlorodifluoromethane			67.7		%		50-150	22-JAN-20
Dichloromethane			93.2		%		50-150	22-JAN-20



Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4973959							
WG3260719-5 MS		WG3260719-3						
Ethylbenzene			97.6		%		50-150	22-JAN-20
m+p-Xylenes			95.1		%		50-150	22-JAN-20
Methyl Ethyl Ketone			82.9		%		50-150	22-JAN-20
Methyl Isobutyl Ketone			92.6		%		50-150	22-JAN-20
n-Hexane			79.6		%		50-150	22-JAN-20
MTBE			92.5		%		50-150	22-JAN-20
o-Xylene			96.3		%		50-150	22-JAN-20
Styrene			97.0		%		50-150	22-JAN-20
Tetrachloroethylene			90.5		%		50-150	22-JAN-20
Toluene			98.1		%		50-150	22-JAN-20
trans-1,2-Dichloroethylene			87.6		%		50-150	22-JAN-20
trans-1,3-Dichloropropene			101.8		%		50-150	22-JAN-20
Trichloroethylene			89.0		%		50-150	22-JAN-20
Trichlorofluoromethane			82.8		%		50-150	22-JAN-20
Vinyl chloride			92.3		%		50-150	22-JAN-20

Quality Control Report

Workorder: L2407471

Report Date: 22-JAN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.



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Report To Contact and company name below will appear on the final report		Report Format / Distribution		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)							
Company: GHD LIMITED - ACCT #13791		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		Regular [R] <input type="checkbox"/> Standard TAT if received by 3 pm - business days - no surcharges apply							
Contact: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		PRIORITY (Business Day)	4 day [P4-20%] <input type="checkbox"/>	EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>				
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)] <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		Date and Time Required for all E&P TATs:							
Street: 455 Phillip St		Email 1 or Fax <u>laura.ermeta@ghd.com</u>		For tests that can not be performed according to the service level selected, you will be contacted.							
City/Province: Waterloo, Ontario		Email 2 See PO		Analysis Request							
Postal Code: N2L 3X2		Email 3									
Invoice To		Invoice Distribution		NUMBER OF CONTAINERS VOC-ROU-HS-WT							
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 <u>laura.ermeta@ghd.com</u>									
Company: GHD Limited		Email 2									
Contact: Laura Ermeta											
Project Information								SAMPLES ON HOLD SUSPECTED HAZARD (see Special Instructions)			
ALS Account # / Quote #: 13791		Oil and Gas Required Fields (client use)									
Job #: 44985-30-10		AFE/Cost Center: PO#									
PO / AFE: 73512223-1		Major/Minor Code: Routing Code:									
LSD:		Requisitioner: Location:									
ALS Lab Work Order # (lab use only): <u>L2407471A</u>		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						
	<u>Influent</u>		<u>20-1-2020</u>	<u>1100</u>	Water	2 ✓					
	<u>E&P Pond</u>		<u>20-1-2020</u>	<u>0830</u>	Water	2 ✓					
					Water						
					Water						
					Water						
					Water						
					Water						
					Water						
					Water						
					Water						
					Water						
					Water						
Drinking Water (DW) Samples¹ (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				Frozen: <input type="checkbox"/> SIF Observations: Yes <input type="checkbox"/> No <input checked="" 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 checked="" type="checkbox"/>							
				INITIAL COOLER TEMPERATURES: °C		FINAL COOLER TEMPERATURES: °C					
				5.6							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)							
Released by: <u>[Signature]</u>		Received by: <u>[Signature]</u>		Date: <u>21-01-20</u>							
Date: <u>Jan 20 2020</u>		Date: <u>21-01-20</u>		Time: <u>1100</u>							
Time: <u>1100</u>		Time: <u>10:15</u>									



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 28-JAN-20
Report Date: 30-JAN-20 12:29 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2410263
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
L2410263-1 EQ POND							
Sampled By: CLIENT on 27-JAN-20 @ 08:55							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		29-JAN-20	R4982844
Benzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Bromodichloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Bromoform	<1.0		1.0	ug/L		29-JAN-20	R4982844
Bromomethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Carbon Disulfide	<1.0		1.0	ug/L		29-JAN-20	R4982844
Carbon tetrachloride	<0.50		0.50	ug/L		29-JAN-20	R4982844
Chlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dibromochloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloroethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloroform	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
1,2-Dibromoethane	<0.20		0.20	ug/L		29-JAN-20	R4982844
1,2-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,3-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,4-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dichlorodifluoromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
1,1-Dichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,2-Dichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dichloromethane	<2.0		2.0	ug/L		29-JAN-20	R4982844
1,2-Dichloropropane	<0.50		0.50	ug/L		29-JAN-20	R4982844
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		29-JAN-20	R4982844
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		29-JAN-20	R4982844
Ethylbenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
n-Hexane	<0.50		0.50	ug/L		29-JAN-20	R4982844
2-Hexanone	<20		20	ug/L		29-JAN-20	R4982844
Methyl Ethyl Ketone	<20		20	ug/L		29-JAN-20	R4982844
Methyl Isobutyl Ketone	<20		20	ug/L		29-JAN-20	R4982844
MTBE	<0.50		0.50	ug/L		29-JAN-20	R4982844
Styrene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Tetrachloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Toluene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,1-Trichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,2-Trichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Trichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Trichlorofluoromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844

* 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
L2410263-1 EQ POND Sampled By: CLIENT on 27-JAN-20 @ 08:55 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		29-JAN-20	R4982844
o-Xylene	<0.30		0.30	ug/L		29-JAN-20	R4982844
m+p-Xylenes	<0.40		0.40	ug/L		29-JAN-20	R4982844
Xylenes (Total)	<0.50		0.50	ug/L		29-JAN-20	
Surrogate: 4-Bromofluorobenzene	98.6		70-130	%		29-JAN-20	R4982844
Surrogate: 1,4-Difluorobenzene	102.1		70-130	%		29-JAN-20	R4982844
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		29-JAN-20	
L2410263-2 WEST POND Sampled By: CLIENT on 27-JAN-20 @ 08:50 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		29-JAN-20	R4982844
Benzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Bromodichloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Bromoform	<1.0		1.0	ug/L		29-JAN-20	R4982844
Bromomethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Carbon Disulfide	<1.0		1.0	ug/L		29-JAN-20	R4982844
Carbon tetrachloride	<0.50		0.50	ug/L		29-JAN-20	R4982844
Chlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dibromochloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloroethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloroform	<1.0		1.0	ug/L		29-JAN-20	R4982844
Chloromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
1,2-Dibromoethane	<0.20		0.20	ug/L		29-JAN-20	R4982844
1,2-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,3-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,4-Dichlorobenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dichlorodifluoromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
1,1-Dichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,2-Dichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Dichloromethane	<2.0		2.0	ug/L		29-JAN-20	R4982844
1,2-Dichloropropane	<0.50		0.50	ug/L		29-JAN-20	R4982844
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		29-JAN-20	R4982844
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		29-JAN-20	R4982844
Ethylbenzene	<0.50		0.50	ug/L		29-JAN-20	R4982844
n-Hexane	<0.50		0.50	ug/L		29-JAN-20	R4982844
2-Hexanone	<20		20	ug/L		29-JAN-20	R4982844
Methyl Ethyl Ketone	<20		20	ug/L		29-JAN-20	R4982844

* 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
L2410263-2 WEST POND							
Sampled By: CLIENT on 27-JAN-20 @ 08:50							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		29-JAN-20	R4982844
MTBE	<0.50		0.50	ug/L		29-JAN-20	R4982844
Styrene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Tetrachloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Toluene	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,1-Trichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
1,1,2-Trichloroethane	<0.50		0.50	ug/L		29-JAN-20	R4982844
Trichloroethylene	<0.50		0.50	ug/L		29-JAN-20	R4982844
Trichlorofluoromethane	<1.0		1.0	ug/L		29-JAN-20	R4982844
Vinyl chloride	<0.50		0.50	ug/L		29-JAN-20	R4982844
o-Xylene	<0.30		0.30	ug/L		29-JAN-20	R4982844
m+p-Xylenes	<0.40		0.40	ug/L		29-JAN-20	R4982844
Xylenes (Total)	<0.50		0.50	ug/L		29-JAN-20	
Surrogate: 4-Bromofluorobenzene	96.9		70-130	%		29-JAN-20	R4982844
Surrogate: 1,4-Difluorobenzene	101.8		70-130	%		29-JAN-20	R4982844
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		29-JAN-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2410263

Report Date: 30-JAN-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4982844							
WG3264814-4	DUP	WG3264814-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	29-JAN-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	29-JAN-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	29-JAN-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Carbon tetrachloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	29-JAN-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	29-JAN-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	29-JAN-20
Methyl Isobutyl Ketone		<20	<20		ug/L			29-JAN-20



Quality Control Report

Workorder: L2410263

Report Date: 30-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4982844							
WG3264814-4	DUP	WG3264814-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	29-JAN-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	29-JAN-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	29-JAN-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	29-JAN-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	29-JAN-20
WG3264814-1	LCS							
1,1,1,2-Tetrachloroethane			96.7		%		70-130	29-JAN-20
1,1,2,2-Tetrachloroethane			91.2		%		70-130	29-JAN-20
1,1,1-Trichloroethane			101.8		%		70-130	29-JAN-20
1,1,2-Trichloroethane			91.5		%		70-130	29-JAN-20
1,2-Dibromoethane			91.2		%		70-130	29-JAN-20
1,1-Dichloroethane			98.4		%		70-130	29-JAN-20
1,1-Dichloroethylene			99.6		%		70-130	29-JAN-20
1,2-Dichlorobenzene			98.8		%		70-130	29-JAN-20
1,2-Dichloroethane			94.1		%		70-130	29-JAN-20
1,2-Dichloropropane			93.3		%		70-130	29-JAN-20
1,3-Dichlorobenzene			99.2		%		70-130	29-JAN-20
1,4-Dichlorobenzene			98.1		%		70-130	29-JAN-20
2-Hexanone			85.9		%		60-140	29-JAN-20
Acetone			97.4		%		60-140	29-JAN-20
Benzene			101.8		%		70-130	29-JAN-20
Bromodichloromethane			91.6		%		70-130	29-JAN-20
Bromoform			96.0		%		70-130	29-JAN-20
Bromomethane			91.8		%		60-140	29-JAN-20
Carbon Disulfide			105.3		%		70-130	29-JAN-20
Carbon tetrachloride			98.4		%		70-130	29-JAN-20



Quality Control Report

Workorder: L2410263

Report Date: 30-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4982844							
WG3264814-1	LCS							
Chlorobenzene			98.9		%		70-130	29-JAN-20
Chloroethane			114.1		%		70-130	29-JAN-20
Chloroform			92.8		%		70-130	29-JAN-20
Chloromethane			109.6		%		60-140	29-JAN-20
cis-1,2-Dichloroethylene			86.5		%		70-130	29-JAN-20
cis-1,3-Dichloropropene			87.0		%		70-130	29-JAN-20
Dibromochloromethane			90.4		%		70-130	29-JAN-20
Dichlorodifluoromethane			115.4		%		50-140	29-JAN-20
Dichloromethane			95.7		%		70-130	29-JAN-20
Ethylbenzene			99.95		%		70-130	29-JAN-20
m+p-Xylenes			100.0		%		70-130	29-JAN-20
Methyl Ethyl Ketone			88.7		%		60-140	29-JAN-20
Methyl Isobutyl Ketone			87.2		%		50-150	29-JAN-20
n-Hexane			98.7		%		70-130	29-JAN-20
MTBE			92.5		%		70-130	29-JAN-20
o-Xylene			98.6		%		70-130	29-JAN-20
Styrene			96.3		%		70-130	29-JAN-20
Tetrachloroethylene			102.2		%		70-130	29-JAN-20
Toluene			100.7		%		70-130	29-JAN-20
trans-1,2-Dichloroethylene			96.5		%		70-130	29-JAN-20
trans-1,3-Dichloropropene			87.1		%		70-130	29-JAN-20
Trichloroethylene			98.6		%		70-130	29-JAN-20
Trichlorofluoromethane			104.1		%		60-140	29-JAN-20
Vinyl chloride			119.2		%		60-140	29-JAN-20
WG3264814-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	29-JAN-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	29-JAN-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	29-JAN-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	29-JAN-20
1,2-Dibromoethane			<0.20		ug/L		0.2	29-JAN-20
1,1-Dichloroethane			<0.50		ug/L		0.5	29-JAN-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	29-JAN-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	29-JAN-20
1,2-Dichloroethane			<0.50		ug/L		0.5	29-JAN-20



Quality Control Report

Workorder: L2410263

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4982844							
WG3264814-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	29-JAN-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	29-JAN-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	29-JAN-20
2-Hexanone			<20		ug/L		20	29-JAN-20
Acetone			<20		ug/L		20	29-JAN-20
Benzene			<0.50		ug/L		0.5	29-JAN-20
Bromodichloromethane			<1.0		ug/L		1	29-JAN-20
Bromoform			<1.0		ug/L		1	29-JAN-20
Bromomethane			<0.50		ug/L		0.5	29-JAN-20
Carbon Disulfide			<1.0		ug/L		1	29-JAN-20
Carbon tetrachloride			<0.50		ug/L		0.5	29-JAN-20
Chlorobenzene			<0.50		ug/L		0.5	29-JAN-20
Chloroethane			<1.0		ug/L		1	29-JAN-20
Chloroform			<1.0		ug/L		1	29-JAN-20
Chloromethane			<1.0		ug/L		1	29-JAN-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	29-JAN-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	29-JAN-20
Dibromochloromethane			<1.0		ug/L		1	29-JAN-20
Dichlorodifluoromethane			<1.0		ug/L		1	29-JAN-20
Dichloromethane			<2.0		ug/L		2	29-JAN-20
Ethylbenzene			<0.50		ug/L		0.5	29-JAN-20
m+p-Xylenes			<0.40		ug/L		0.4	29-JAN-20
Methyl Ethyl Ketone			<20		ug/L		20	29-JAN-20
Methyl Isobutyl Ketone			<20		ug/L		20	29-JAN-20
n-Hexane			<0.50		ug/L		0.5	29-JAN-20
MTBE			<0.50		ug/L		0.5	29-JAN-20
o-Xylene			<0.30		ug/L		0.3	29-JAN-20
Styrene			<0.50		ug/L		0.5	29-JAN-20
Tetrachloroethylene			<0.50		ug/L		0.5	29-JAN-20
Toluene			<0.50		ug/L		0.5	29-JAN-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	29-JAN-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	29-JAN-20
Trichloroethylene			<0.50		ug/L		0.5	29-JAN-20



Quality Control Report

Workorder: L2410263

Report Date: 30-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4982844							
WG3264814-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	29-JAN-20
Vinyl chloride			<0.50		ug/L		0.5	29-JAN-20
Surrogate: 1,4-Difluorobenzene			101.6		%		70-130	29-JAN-20
Surrogate: 4-Bromofluorobenzene			97.6		%		70-130	29-JAN-20
WG3264814-5 MS		WG3264814-3						
1,1,1,2-Tetrachloroethane			96.1		%		50-150	29-JAN-20
1,1,2,2-Tetrachloroethane			88.3		%		50-150	29-JAN-20
1,1,1-Trichloroethane			101.1		%		50-150	29-JAN-20
1,1,2-Trichloroethane			90.6		%		50-150	29-JAN-20
1,2-Dibromoethane			90.0		%		50-150	29-JAN-20
1,1-Dichloroethane			97.3		%		50-150	29-JAN-20
1,1-Dichloroethylene			93.6		%		50-150	29-JAN-20
1,2-Dichlorobenzene			97.9		%		50-150	29-JAN-20
1,2-Dichloroethane			94.0		%		50-150	29-JAN-20
1,2-Dichloropropane			93.7		%		50-150	29-JAN-20
1,3-Dichlorobenzene			100.3		%		50-150	29-JAN-20
1,4-Dichlorobenzene			98.6		%		50-150	29-JAN-20
2-Hexanone			79.9		%		50-150	29-JAN-20
Acetone			97.1		%		50-150	29-JAN-20
Benzene			101.6		%		50-150	29-JAN-20
Bromodichloromethane			92.2		%		50-150	29-JAN-20
Bromoform			93.0		%		50-150	29-JAN-20
Bromomethane			83.1		%		50-150	29-JAN-20
Carbon Disulfide			96.3		%		50-150	29-JAN-20
Carbon tetrachloride			97.2		%		50-150	29-JAN-20
Chlorobenzene			99.3		%		50-150	29-JAN-20
Chloroethane			104.5		%		50-150	29-JAN-20
Chloroform			93.5		%		50-150	29-JAN-20
Chloromethane			92.2		%		50-150	29-JAN-20
cis-1,2-Dichloroethylene			84.6		%		50-150	29-JAN-20
cis-1,3-Dichloropropene			87.3		%		50-150	29-JAN-20
Dibromochloromethane			88.5		%		50-150	29-JAN-20
Dichlorodifluoromethane			89.0		%		50-150	29-JAN-20
Dichloromethane			93.7		%		50-150	29-JAN-20



Quality Control Report

Workorder: L2410263

Report Date: 30-JAN-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	Water							
Batch	R4982844							
WG3264814-5 MS		WG3264814-3						
Ethylbenzene			100.9		%		50-150	29-JAN-20
m+p-Xylenes			100.8		%		50-150	29-JAN-20
Methyl Ethyl Ketone			78.3		%		50-150	29-JAN-20
Methyl Isobutyl Ketone			84.0		%		50-150	29-JAN-20
n-Hexane			91.8		%		50-150	29-JAN-20
MTBE			93.1		%		50-150	29-JAN-20
o-Xylene			99.7		%		50-150	29-JAN-20
Styrene			96.1		%		50-150	29-JAN-20
Tetrachloroethylene			100.9		%		50-150	29-JAN-20
Toluene			100.7		%		50-150	29-JAN-20
trans-1,2-Dichloroethylene			93.9		%		50-150	29-JAN-20
trans-1,3-Dichloropropene			86.9		%		50-150	29-JAN-20
Trichloroethylene			98.3		%		50-150	29-JAN-20
Trichlorofluoromethane			95.5		%		50-150	29-JAN-20
Vinyl chloride			102.9		%		50-150	29-JAN-20

Quality Control Report

Workorder: L2410263

Report Date: 30-JAN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 04-FEB-20
Report Date: 05-FEB-20 09:21 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2412733
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
C of C Numbers:
Legal Site Desc:

Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2412733-1 EQ POND							
Sampled By: CLIENT on 03-FEB-20 @ 08:00							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		05-FEB-20	R4989308
Benzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Bromodichloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Bromoform	<1.0		1.0	ug/L		05-FEB-20	R4989308
Bromomethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Carbon Disulfide	<1.0		1.0	ug/L		05-FEB-20	R4989308
Carbon tetrachloride	<0.50		0.50	ug/L		05-FEB-20	R4989308
Chlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dibromochloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloroethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloroform	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
1,2-Dibromoethane	<0.20		0.20	ug/L		05-FEB-20	R4989308
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dichlorodifluoromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
1,1-Dichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,2-Dichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dichloromethane	<2.0		2.0	ug/L		05-FEB-20	R4989308
1,2-Dichloropropane	<0.50		0.50	ug/L		05-FEB-20	R4989308
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-FEB-20	R4989308
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-FEB-20	R4989308
Ethylbenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
n-Hexane	<0.50		0.50	ug/L		05-FEB-20	R4989308
2-Hexanone	<20		20	ug/L		05-FEB-20	R4989308
Methyl Ethyl Ketone	<20		20	ug/L		05-FEB-20	R4989308
Methyl Isobutyl Ketone	<20		20	ug/L		05-FEB-20	R4989308
MTBE	<0.50		0.50	ug/L		05-FEB-20	R4989308
Styrene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Tetrachloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Toluene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Trichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Trichlorofluoromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308

* 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
L2412733-1 EQ POND Sampled By: CLIENT on 03-FEB-20 @ 08:00 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		05-FEB-20	R4989308
o-Xylene	<0.30		0.30	ug/L		05-FEB-20	R4989308
m+p-Xylenes	<0.40		0.40	ug/L		05-FEB-20	R4989308
Xylenes (Total)	<0.50		0.50	ug/L		05-FEB-20	
Surrogate: 4-Bromofluorobenzene	95.2		70-130	%		05-FEB-20	R4989308
Surrogate: 1,4-Difluorobenzene	99.9		70-130	%		05-FEB-20	R4989308
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		05-FEB-20	
L2412733-2 WEST RETENTION STORM POND Sampled By: CLIENT on 03-FEB-20 @ 08:05 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		05-FEB-20	R4989308
Benzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Bromodichloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Bromoform	<1.0		1.0	ug/L		05-FEB-20	R4989308
Bromomethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Carbon Disulfide	<1.0		1.0	ug/L		05-FEB-20	R4989308
Carbon tetrachloride	<0.50		0.50	ug/L		05-FEB-20	R4989308
Chlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dibromochloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloroethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloroform	<1.0		1.0	ug/L		05-FEB-20	R4989308
Chloromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
1,2-Dibromoethane	<0.20		0.20	ug/L		05-FEB-20	R4989308
1,2-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,3-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,4-Dichlorobenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dichlorodifluoromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
1,1-Dichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,2-Dichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Dichloromethane	<2.0		2.0	ug/L		05-FEB-20	R4989308
1,2-Dichloropropane	<0.50		0.50	ug/L		05-FEB-20	R4989308
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		05-FEB-20	R4989308
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		05-FEB-20	R4989308
Ethylbenzene	<0.50		0.50	ug/L		05-FEB-20	R4989308
n-Hexane	<0.50		0.50	ug/L		05-FEB-20	R4989308
2-Hexanone	<20		20	ug/L		05-FEB-20	R4989308
Methyl Ethyl Ketone	<20		20	ug/L		05-FEB-20	R4989308

* 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
L2412733-2 WEST RETENTION STORM POND							
Sampled By: CLIENT on 03-FEB-20 @ 08:05							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		05-FEB-20	R4989308
MTBE	<0.50		0.50	ug/L		05-FEB-20	R4989308
Styrene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Tetrachloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Toluene	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,1-Trichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
1,1,2-Trichloroethane	<0.50		0.50	ug/L		05-FEB-20	R4989308
Trichloroethylene	<0.50		0.50	ug/L		05-FEB-20	R4989308
Trichlorofluoromethane	<1.0		1.0	ug/L		05-FEB-20	R4989308
Vinyl chloride	<0.50		0.50	ug/L		05-FEB-20	R4989308
o-Xylene	<0.30		0.30	ug/L		05-FEB-20	R4989308
m+p-Xylenes	<0.40		0.40	ug/L		05-FEB-20	R4989308
Xylenes (Total)	<0.50		0.50	ug/L		05-FEB-20	
Surrogate: 4-Bromofluorobenzene	97.9		70-130	%		05-FEB-20	R4989308
Surrogate: 1,4-Difluorobenzene	98.8		70-130	%		05-FEB-20	R4989308
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		05-FEB-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2412733

Report Date: 05-FEB-20

Page 1 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4989308							
WG3268931-4	DUP	WG3268931-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	05-FEB-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	05-FEB-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	05-FEB-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Carbon tetrachloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-FEB-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	05-FEB-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-FEB-20
Methyl Isobutyl Ketone		<20	<20		ug/L			05-FEB-20



Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4989308							
WG3268931-4	DUP	WG3268931-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	05-FEB-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-FEB-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	05-FEB-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	05-FEB-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	05-FEB-20
WG3268931-1	LCS							
1,1,1,2-Tetrachloroethane			95.2		%		70-130	04-FEB-20
1,1,2,2-Tetrachloroethane			88.9		%		70-130	04-FEB-20
1,1,1-Trichloroethane			104.8		%		70-130	04-FEB-20
1,1,2-Trichloroethane			94.5		%		70-130	04-FEB-20
1,2-Dibromoethane			91.9		%		70-130	04-FEB-20
1,1-Dichloroethane			105.2		%		70-130	04-FEB-20
1,1-Dichloroethylene			105.1		%		70-130	04-FEB-20
1,2-Dichlorobenzene			102.0		%		70-130	04-FEB-20
1,2-Dichloroethane			100.2		%		70-130	04-FEB-20
1,2-Dichloropropane			103.6		%		70-130	04-FEB-20
1,3-Dichlorobenzene			102.1		%		70-130	04-FEB-20
1,4-Dichlorobenzene			101.6		%		70-130	04-FEB-20
2-Hexanone			81.1		%		60-140	04-FEB-20
Acetone			102.0		%		60-140	04-FEB-20
Benzene			107.6		%		70-130	04-FEB-20
Bromodichloromethane			98.5		%		70-130	04-FEB-20
Bromoform			84.3		%		70-130	04-FEB-20
Bromomethane			93.3		%		60-140	04-FEB-20
Carbon Disulfide			109.2		%		70-130	04-FEB-20
Carbon tetrachloride			105.9		%		70-130	04-FEB-20



Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4989308							
WG3268931-1	LCS							
Chlorobenzene			100.7		%		70-130	04-FEB-20
Chloroethane			123.9		%		70-130	04-FEB-20
Chloroform			105.2		%		70-130	04-FEB-20
Chloromethane			106.4		%		60-140	04-FEB-20
cis-1,2-Dichloroethylene			100.8		%		70-130	04-FEB-20
cis-1,3-Dichloropropene			99.3		%		70-130	04-FEB-20
Dibromochloromethane			86.7		%		70-130	04-FEB-20
Dichlorodifluoromethane			103.1		%		50-140	04-FEB-20
Dichloromethane			102.5		%		70-130	04-FEB-20
Ethylbenzene			105.9		%		70-130	04-FEB-20
m+p-Xylenes			104.9		%		70-130	04-FEB-20
Methyl Ethyl Ketone			86.9		%		60-140	04-FEB-20
Methyl Isobutyl Ketone			82.8		%		50-150	04-FEB-20
n-Hexane			104.5		%		70-130	04-FEB-20
MTBE			105.2		%		70-130	04-FEB-20
o-Xylene			103.5		%		70-130	04-FEB-20
Styrene			101.8		%		70-130	04-FEB-20
Tetrachloroethylene			103.2		%		70-130	04-FEB-20
Toluene			104.5		%		70-130	04-FEB-20
trans-1,2-Dichloroethylene			103.8		%		70-130	04-FEB-20
trans-1,3-Dichloropropene			96.2		%		70-130	04-FEB-20
Trichloroethylene			103.3		%		70-130	04-FEB-20
Trichlorofluoromethane			106.3		%		60-140	04-FEB-20
Vinyl chloride			118.4		%		60-140	04-FEB-20
WG3268931-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	05-FEB-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	05-FEB-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	05-FEB-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	05-FEB-20
1,2-Dibromoethane			<0.20		ug/L		0.2	05-FEB-20
1,1-Dichloroethane			<0.50		ug/L		0.5	05-FEB-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	05-FEB-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	05-FEB-20
1,2-Dichloroethane			<0.50		ug/L		0.5	05-FEB-20



Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4989308							
WG3268931-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	05-FEB-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	05-FEB-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	05-FEB-20
2-Hexanone			<20		ug/L		20	05-FEB-20
Acetone			<20		ug/L		20	05-FEB-20
Benzene			<0.50		ug/L		0.5	05-FEB-20
Bromodichloromethane			<1.0		ug/L		1	05-FEB-20
Bromoform			<1.0		ug/L		1	05-FEB-20
Bromomethane			<0.50		ug/L		0.5	05-FEB-20
Carbon Disulfide			<1.0		ug/L		1	05-FEB-20
Carbon tetrachloride			<0.50		ug/L		0.5	05-FEB-20
Chlorobenzene			<0.50		ug/L		0.5	05-FEB-20
Chloroethane			<1.0		ug/L		1	05-FEB-20
Chloroform			<1.0		ug/L		1	05-FEB-20
Chloromethane			<1.0		ug/L		1	05-FEB-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-FEB-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	05-FEB-20
Dibromochloromethane			<1.0		ug/L		1	05-FEB-20
Dichlorodifluoromethane			<1.0		ug/L		1	05-FEB-20
Dichloromethane			<2.0		ug/L		2	05-FEB-20
Ethylbenzene			<0.50		ug/L		0.5	05-FEB-20
m+p-Xylenes			<0.40		ug/L		0.4	05-FEB-20
Methyl Ethyl Ketone			<20		ug/L		20	05-FEB-20
Methyl Isobutyl Ketone			<20		ug/L		20	05-FEB-20
n-Hexane			<0.50		ug/L		0.5	05-FEB-20
MTBE			<0.50		ug/L		0.5	05-FEB-20
o-Xylene			<0.30		ug/L		0.3	05-FEB-20
Styrene			<0.50		ug/L		0.5	05-FEB-20
Tetrachloroethylene			<0.50		ug/L		0.5	05-FEB-20
Toluene			<0.50		ug/L		0.5	05-FEB-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	05-FEB-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	05-FEB-20
Trichloroethylene			<0.50		ug/L		0.5	05-FEB-20



Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4989308							
WG3268931-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	05-FEB-20
Vinyl chloride			<0.50		ug/L		0.5	05-FEB-20
Surrogate: 1,4-Difluorobenzene			99.1		%		70-130	05-FEB-20
Surrogate: 4-Bromofluorobenzene			95.9		%		70-130	05-FEB-20
WG3268931-5 MS		WG3268931-3						
1,1,1,2-Tetrachloroethane			98.1		%		50-150	05-FEB-20
1,1,1,2,2-Tetrachloroethane			112.6		%		50-150	05-FEB-20
1,1,1-Trichloroethane			98.4		%		50-150	05-FEB-20
1,1,2-Trichloroethane			109.6		%		50-150	05-FEB-20
1,2-Dibromoethane			110.6		%		50-150	05-FEB-20
1,1-Dichloroethane			106.7		%		50-150	05-FEB-20
1,1-Dichloroethylene			102.6		%		50-150	05-FEB-20
1,2-Dichlorobenzene			103.1		%		50-150	05-FEB-20
1,2-Dichloroethane			117.0		%		50-150	05-FEB-20
1,2-Dichloropropane			111.9		%		50-150	05-FEB-20
1,3-Dichlorobenzene			96.4		%		50-150	05-FEB-20
1,4-Dichlorobenzene			97.7		%		50-150	05-FEB-20
2-Hexanone			118.7		%		50-150	05-FEB-20
Acetone			131.7		%		50-150	05-FEB-20
Benzene			108.5		%		50-150	05-FEB-20
Bromodichloromethane			107.2		%		50-150	05-FEB-20
Bromoform			101.5		%		50-150	05-FEB-20
Bromomethane			97.5		%		50-150	05-FEB-20
Carbon Disulfide			100.6		%		50-150	05-FEB-20
Carbon tetrachloride			97.1		%		50-150	05-FEB-20
Chlorobenzene			101.4		%		50-150	05-FEB-20
Chloroethane			117.3		%		50-150	05-FEB-20
Chloroform			107.2		%		50-150	05-FEB-20
Chloromethane			100.4		%		50-150	05-FEB-20
cis-1,2-Dichloroethylene			103.5		%		50-150	05-FEB-20
cis-1,3-Dichloropropene			106.3		%		50-150	05-FEB-20
Dibromochloromethane			97.2		%		50-150	05-FEB-20
Dichlorodifluoromethane			87.3		%		50-150	05-FEB-20
Dichloromethane			109.2		%		50-150	05-FEB-20



Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	Water							
Batch	R4989308							
WG3268931-5 MS		WG3268931-3						
Ethylbenzene			99.2		%		50-150	05-FEB-20
m+p-Xylenes			99.0		%		50-150	05-FEB-20
Methyl Ethyl Ketone			119.3		%		50-150	05-FEB-20
Methyl Isobutyl Ketone			119.4		%		50-150	05-FEB-20
n-Hexane			92.1		%		50-150	05-FEB-20
MTBE			105.6		%		50-150	05-FEB-20
o-Xylene			100.6		%		50-150	05-FEB-20
Styrene			103.6		%		50-150	05-FEB-20
Tetrachloroethylene			96.8		%		50-150	05-FEB-20
Toluene			100.6		%		50-150	05-FEB-20
trans-1,2-Dichloroethylene			99.1		%		50-150	05-FEB-20
trans-1,3-Dichloropropene			107.8		%		50-150	05-FEB-20
Trichloroethylene			99.2		%		50-150	05-FEB-20
Trichlorofluoromethane			94.5		%		50-150	05-FEB-20
Vinyl chloride			108.3		%		50-150	05-FEB-20

Quality Control Report

Workorder: L2412733

Report Date: 05-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.

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Report To Contact and company name below will appear on the final report		Report Format			w - Contact your AM to confirm all E&P TATs (surcharges may apply)		
Company:	GHD LIMITED - ACCT #13791	Select Report Format:	<input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)	Tard TAT if received by 3 pm - business days - no surcharges apply			
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	EMERGENCY <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		<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 checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX	Date and Time Required for all E&P TATs:			
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com		For tests that can not be performed according to the service level selected, you will be contacted.		
City/Province:	Waterloo, Ontario	Email 2	See PO		Analysis Request		
Postal Code:	N2L 3X2	Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below		
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution			NUMBER OF CONTAINERS VOC-ROU-HS-WT	SAMPLES ON HOLD	
	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				SUSPECTED HAZARD (see Special Instructions)
Company:	GHD Limited	Email 1 or Fax	laura.ermeta@ghd.com				
Contact:	Laura Ermeta	Email 2					
Project Information		Oil and Gas Required Fields (client use)					
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#				
Job #:	44985-30-10	Major/Minor Code:	Routing Code:				
PO / AFE:	73512223-1	Requisitioner:					
LSD:		Location:					
ALS Lab Work Order # (lab use only): L2412733		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			
	EQ Pond	03/02/20	08:00	Water	2	X	
	West Retention STAIN Pond	"	08:05	Water	2	X	
				Water			
				Water			
				Water			
				Water			
				Water			
				Water			
				Water			
				Water			
				Water			
				Water			
Drinking Water (DW) Samples (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					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 checked="" type="checkbox"/> Ice Cubes <input checked="" type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>		
					Cooling Initiated <input checked="" type="checkbox"/>		
					INITIAL COOLER TEMPERATURES °C		
					FINAL COOLER TEMPERATURES °C		
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: R. Tobin	Date: Feb 03/20	Time: 09:00	Received by:	Date:	Time:	Received by: [Signature]	
						Date: 4 Feb 20	
						Time: 9:45	



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 11-FEB-20
Report Date: 12-FEB-20 10:53 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2415371
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
C of C Numbers: LON-190103
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
L2415371-1 EQ POND							
Sampled By: CLIENT on 10-FEB-20 @ 09:00							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		12-FEB-20	R4994706
Benzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Bromodichloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Bromoform	<1.0		1.0	ug/L		12-FEB-20	R4994706
Bromomethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Carbon Disulfide	<1.0		1.0	ug/L		12-FEB-20	R4994706
Carbon tetrachloride	<0.20		0.20	ug/L		12-FEB-20	R4994706
Chlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dibromochloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloroethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloroform	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
1,2-Dibromoethane	<0.20		0.20	ug/L		12-FEB-20	R4994706
1,2-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,3-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,4-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dichlorodifluoromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
1,1-Dichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,2-Dichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dichloromethane	<2.0		2.0	ug/L		12-FEB-20	R4994706
1,2-Dichloropropane	<0.50		0.50	ug/L		12-FEB-20	R4994706
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		12-FEB-20	R4994706
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		12-FEB-20	R4994706
Ethylbenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
n-Hexane	<0.50		0.50	ug/L		12-FEB-20	R4994706
2-Hexanone	<20		20	ug/L		12-FEB-20	R4994706
Methyl Ethyl Ketone	<20		20	ug/L		12-FEB-20	R4994706
Methyl Isobutyl Ketone	<20		20	ug/L		12-FEB-20	R4994706
MTBE	<0.50		0.50	ug/L		12-FEB-20	R4994706
Styrene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Tetrachloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Toluene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,1-Trichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,2-Trichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Trichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Trichlorofluoromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706

* 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
L2415371-1 EQ POND Sampled By: CLIENT on 10-FEB-20 @ 09:00 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		12-FEB-20	R4994706
o-Xylene	<0.30		0.30	ug/L		12-FEB-20	R4994706
m+p-Xylenes	<0.40		0.40	ug/L		12-FEB-20	R4994706
Xylenes (Total)	<0.50		0.50	ug/L		12-FEB-20	
Surrogate: 4-Bromofluorobenzene	97.6		70-130	%		12-FEB-20	R4994706
Surrogate: 1,4-Difluorobenzene	99.3		70-130	%		12-FEB-20	R4994706
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		12-FEB-20	
L2415371-2 WEST RETENTION POND Sampled By: CLIENT on 10-FEB-20 @ 09:00 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		12-FEB-20	R4994706
Benzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Bromodichloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Bromoform	<1.0		1.0	ug/L		12-FEB-20	R4994706
Bromomethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Carbon Disulfide	<1.0		1.0	ug/L		12-FEB-20	R4994706
Carbon tetrachloride	<0.20		0.20	ug/L		12-FEB-20	R4994706
Chlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dibromochloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloroethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloroform	<1.0		1.0	ug/L		12-FEB-20	R4994706
Chloromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
1,2-Dibromoethane	<0.20		0.20	ug/L		12-FEB-20	R4994706
1,2-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,3-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,4-Dichlorobenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dichlorodifluoromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
1,1-Dichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,2-Dichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Dichloromethane	<2.0		2.0	ug/L		12-FEB-20	R4994706
1,2-Dichloropropane	<0.50		0.50	ug/L		12-FEB-20	R4994706
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		12-FEB-20	R4994706
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		12-FEB-20	R4994706
Ethylbenzene	<0.50		0.50	ug/L		12-FEB-20	R4994706
n-Hexane	<0.50		0.50	ug/L		12-FEB-20	R4994706
2-Hexanone	<20		20	ug/L		12-FEB-20	R4994706
Methyl Ethyl Ketone	<20		20	ug/L		12-FEB-20	R4994706

* 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
L2415371-2 WEST RETENTION POND							
Sampled By: CLIENT on 10-FEB-20 @ 09:00							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		12-FEB-20	R4994706
MTBE	<0.50		0.50	ug/L		12-FEB-20	R4994706
Styrene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Tetrachloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Toluene	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,1-Trichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
1,1,2-Trichloroethane	<0.50		0.50	ug/L		12-FEB-20	R4994706
Trichloroethylene	<0.50		0.50	ug/L		12-FEB-20	R4994706
Trichlorofluoromethane	<1.0		1.0	ug/L		12-FEB-20	R4994706
Vinyl chloride	<0.50		0.50	ug/L		12-FEB-20	R4994706
o-Xylene	<0.30		0.30	ug/L		12-FEB-20	R4994706
m+p-Xylenes	<0.40		0.40	ug/L		12-FEB-20	R4994706
Xylenes (Total)	<0.50		0.50	ug/L		12-FEB-20	
Surrogate: 4-Bromofluorobenzene	99.1		70-130	%		12-FEB-20	R4994706
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		12-FEB-20	R4994706
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		12-FEB-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:

LON-190103

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: L2415371

Report Date: 12-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4994706							
WG3273291-4	DUP	WG3273291-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-FEB-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	12-FEB-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	12-FEB-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	12-FEB-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-FEB-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	12-FEB-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-FEB-20
Methyl Isobutyl Ketone		<20	<20		ug/L			12-FEB-20



Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4994706							
WG3273291-4	DUP	WG3273291-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	12-FEB-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-FEB-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	12-FEB-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	12-FEB-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	12-FEB-20
WG3273291-1	LCS							
1,1,1,2-Tetrachloroethane			109.0		%		70-130	12-FEB-20
1,1,2,2-Tetrachloroethane			107.4		%		70-130	12-FEB-20
1,1,1-Trichloroethane			104.5		%		70-130	12-FEB-20
1,1,2-Trichloroethane			106.4		%		70-130	12-FEB-20
1,2-Dibromoethane			104.9		%		70-130	12-FEB-20
1,1-Dichloroethane			105.9		%		70-130	12-FEB-20
1,1-Dichloroethylene			101.1		%		70-130	12-FEB-20
1,2-Dichlorobenzene			102.0		%		70-130	12-FEB-20
1,2-Dichloroethane			105.4		%		70-130	12-FEB-20
1,2-Dichloropropane			108.1		%		70-130	12-FEB-20
1,3-Dichlorobenzene			99.8		%		70-130	12-FEB-20
1,4-Dichlorobenzene			99.5		%		70-130	12-FEB-20
2-Hexanone			106.5		%		60-140	12-FEB-20
Acetone			118.1		%		60-140	12-FEB-20
Benzene			109.0		%		70-130	12-FEB-20
Bromodichloromethane			104.1		%		70-130	12-FEB-20
Bromoform			103.1		%		70-130	12-FEB-20
Bromomethane			96.5		%		60-140	12-FEB-20
Carbon Disulfide			107.0		%		70-130	12-FEB-20
Carbon tetrachloride			105.9		%		70-130	12-FEB-20



Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R4994706							
WG3273291-1	LCS							
Chlorobenzene			105.7		%		70-130	12-FEB-20
Chloroethane			119.3		%		70-130	12-FEB-20
Chloroform			107.5		%		70-130	12-FEB-20
Chloromethane			112.4		%		60-140	12-FEB-20
cis-1,2-Dichloroethylene			103.4		%		70-130	12-FEB-20
cis-1,3-Dichloropropene			104.9		%		70-130	12-FEB-20
Dibromochloromethane			101.9		%		70-130	12-FEB-20
Dichlorodifluoromethane			111.3		%		50-140	12-FEB-20
Dichloromethane			106.4		%		70-130	12-FEB-20
Ethylbenzene			104.4		%		70-130	12-FEB-20
m+p-Xylenes			103.6		%		70-130	12-FEB-20
Methyl Ethyl Ketone			108.6		%		60-140	12-FEB-20
Methyl Isobutyl Ketone			102.5		%		50-150	12-FEB-20
n-Hexane			101.1		%		70-130	12-FEB-20
MTBE			105.1		%		70-130	12-FEB-20
o-Xylene			104.5		%		70-130	12-FEB-20
Styrene			105.7		%		70-130	12-FEB-20
Tetrachloroethylene			104.2		%		70-130	12-FEB-20
Toluene			106.7		%		70-130	12-FEB-20
trans-1,2-Dichloroethylene			101.0		%		70-130	12-FEB-20
trans-1,3-Dichloropropene			106.1		%		70-130	12-FEB-20
Trichloroethylene			104.1		%		70-130	12-FEB-20
Trichlorofluoromethane			104.9		%		60-140	12-FEB-20
Vinyl chloride			119.8		%		60-140	12-FEB-20
WG3273291-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	12-FEB-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	12-FEB-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	12-FEB-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	12-FEB-20
1,2-Dibromoethane			<0.20		ug/L		0.2	12-FEB-20
1,1-Dichloroethane			<0.50		ug/L		0.5	12-FEB-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	12-FEB-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	12-FEB-20
1,2-Dichloroethane			<0.50		ug/L		0.5	12-FEB-20



Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4994706							
WG3273291-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	12-FEB-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	12-FEB-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	12-FEB-20
2-Hexanone			<20		ug/L		20	12-FEB-20
Acetone			<20		ug/L		20	12-FEB-20
Benzene			<0.50		ug/L		0.5	12-FEB-20
Bromodichloromethane			<1.0		ug/L		1	12-FEB-20
Bromoform			<1.0		ug/L		1	12-FEB-20
Bromomethane			<0.50		ug/L		0.5	12-FEB-20
Carbon Disulfide			<1.0		ug/L		1	12-FEB-20
Carbon tetrachloride			<0.20		ug/L		0.2	12-FEB-20
Chlorobenzene			<0.50		ug/L		0.5	12-FEB-20
Chloroethane			<1.0		ug/L		1	12-FEB-20
Chloroform			<1.0		ug/L		1	12-FEB-20
Chloromethane			<1.0		ug/L		1	12-FEB-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-FEB-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	12-FEB-20
Dibromochloromethane			<1.0		ug/L		1	12-FEB-20
Dichlorodifluoromethane			<1.0		ug/L		1	12-FEB-20
Dichloromethane			<2.0		ug/L		2	12-FEB-20
Ethylbenzene			<0.50		ug/L		0.5	12-FEB-20
m+p-Xylenes			<0.40		ug/L		0.4	12-FEB-20
Methyl Ethyl Ketone			<20		ug/L		20	12-FEB-20
Methyl Isobutyl Ketone			<20		ug/L		20	12-FEB-20
n-Hexane			<0.50		ug/L		0.5	12-FEB-20
MTBE			<0.50		ug/L		0.5	12-FEB-20
o-Xylene			<0.30		ug/L		0.3	12-FEB-20
Styrene			<0.50		ug/L		0.5	12-FEB-20
Tetrachloroethylene			<0.50		ug/L		0.5	12-FEB-20
Toluene			<0.50		ug/L		0.5	12-FEB-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	12-FEB-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	12-FEB-20
Trichloroethylene			<0.50		ug/L		0.5	12-FEB-20



Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

Page 5 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4994706							
WG3273291-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	12-FEB-20
Vinyl chloride			<0.50		ug/L		0.5	12-FEB-20
Surrogate: 1,4-Difluorobenzene			99.7		%		70-130	12-FEB-20
Surrogate: 4-Bromofluorobenzene			100.0		%		70-130	12-FEB-20
WG3273291-5 MS		WG3273291-3						
1,1,1,2-Tetrachloroethane			104.8		%		50-150	12-FEB-20
1,1,2,2-Tetrachloroethane			92.4		%		50-150	12-FEB-20
1,1,1-Trichloroethane			108.0		%		50-150	12-FEB-20
1,1,2-Trichloroethane			94.8		%		50-150	12-FEB-20
1,2-Dibromoethane			90.9		%		50-150	12-FEB-20
1,1-Dichloroethane			105.4		%		50-150	12-FEB-20
1,1-Dichloroethylene			104.5		%		50-150	12-FEB-20
1,2-Dichlorobenzene			100.9		%		50-150	12-FEB-20
1,2-Dichloroethane			94.7		%		50-150	12-FEB-20
1,2-Dichloropropane			102.2		%		50-150	12-FEB-20
1,3-Dichlorobenzene			104.8		%		50-150	12-FEB-20
1,4-Dichlorobenzene			103.6		%		50-150	12-FEB-20
2-Hexanone			82.2		%		50-150	12-FEB-20
Acetone			102.1		%		50-150	12-FEB-20
Benzene			107.6		%		50-150	12-FEB-20
Bromodichloromethane			98.6		%		50-150	12-FEB-20
Bromoform			90.1		%		50-150	12-FEB-20
Bromomethane			91.7		%		50-150	12-FEB-20
Carbon Disulfide			111.0		%		50-150	12-FEB-20
Carbon tetrachloride			111.3		%		50-150	12-FEB-20
Chlorobenzene			105.9		%		50-150	12-FEB-20
Chloroethane			115.0		%		50-150	12-FEB-20
Chloroform			105.6		%		50-150	12-FEB-20
Chloromethane			102.7		%		50-150	12-FEB-20
cis-1,2-Dichloroethylene			101.8		%		50-150	12-FEB-20
cis-1,3-Dichloropropene			108.8		%		50-150	12-FEB-20
Dibromochloromethane			92.7		%		50-150	12-FEB-20
Dichlorodifluoromethane			99.8		%		50-150	12-FEB-20
Dichloromethane			100.4		%		50-150	12-FEB-20



Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

Page 6 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R4994706							
WG3273291-5	MS	WG3273291-3						
Ethylbenzene			109.0		%		50-150	12-FEB-20
m+p-Xylenes			109.3		%		50-150	12-FEB-20
Methyl Ethyl Ketone			79.3		%		50-150	12-FEB-20
Methyl Isobutyl Ketone			82.2		%		50-150	12-FEB-20
n-Hexane			104.6		%		50-150	12-FEB-20
MTBE			105.6		%		50-150	12-FEB-20
o-Xylene			106.3		%		50-150	12-FEB-20
Styrene			104.4		%		50-150	12-FEB-20
Tetrachloroethylene			114.1		%		50-150	12-FEB-20
Toluene			108.4		%		50-150	12-FEB-20
trans-1,2-Dichloroethylene			106.0		%		50-150	12-FEB-20
trans-1,3-Dichloropropene			103.8		%		50-150	12-FEB-20
Trichloroethylene			108.8		%		50-150	12-FEB-20
Trichlorofluoromethane			106.0		%		50-150	12-FEB-20
Vinyl chloride			114.5		%		50-150	12-FEB-20

Quality Control Report

Workorder: L2415371

Report Date: 12-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 7 of 7

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

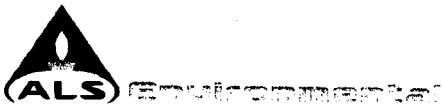
Hold Time Exceedances:

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.



Chain of Custody (COC) / Analytical Request Form



COC Number: 17 -

Canada Toll Free: 1 800 668 9878

L2415371-COFC

Page 1 of 1

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Standard TAT (surcharges may apply)					
Company:	GHD LIMITED - ACCT #13791	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:	Laura Ermeta	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"/>	EMERGENCY	1 Business day [E - 100%]	<input type="checkbox"/>	
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)]	<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	Date and Time Required for all E&P TATs:						
Street:	455 Phillip St	Email 1 or Fax:	laura.ermeta@ghd.com	For tests that can not be performed according to the service level selected, you will be contacted.						
City/Province:	Waterloo, Ontario	Email 2:	See PO	Analysis Request						
Postal Code:	N2L 3X2	Email 3:		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below						
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Invoice Distribution			NUMBER OF CONTAINERS VOC-ROU-HS-WT	SAMPLES ON HOLD				SUSPECTED HAZARD (see Special Instructions)
	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							
Company:	GHD Limited	Email 1 or Fax:	laura.ermeta@ghd.com							
Contact:	Laura Ermeta	Email 2:								
Project Information		Oil and Gas Required Fields (client use)								
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#							
Job #:	44985-30-10	Major/Minor Code:	Routing Code:							
PO / AFE:	73512223-1	Requisitioner:								
LSD:		Location:								
ALS Lab Work Order # (lab use only):	L2415371-2	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						
	ED Pond	10-Feb-20	09:00	Water	2	X				
	West Retention Pond	10-Feb-20	09:00	Water	2	X				
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
				Water						
Drinking Water (DW) Samples¹ (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					Frozen <input type="checkbox"/> SJE 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 (plastic) <input type="checkbox"/>					
					INITIAL COOLER TEMPERATURES °C					
					FINAL COOLER TEMPERATURES °C					
					8.4					
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)					
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:		
<i>[Signature]</i>	Feb 10/20	12:00					Feb 11/20	9P		

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION. 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. JUNE 2018 FRONT



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 20-FEB-20
Report Date: 27-FEB-20 14:03 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2418792
Project P.O. #: 73506479
Job Reference: 44985-20-19
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
L2418792-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 17-FEB-20 @ 10:00							
Matrix: WATER							
Field Tests							
pH, Client Supplied	7.36		0.10	pH		21-FEB-20	R4999272
Temperature, Client	2.5		-50	Deg. C		21-FEB-20	R4999272
Physical Tests							
Conductivity	775		3.0	umhos/cm		20-FEB-20	R4999478
Hardness (as CaCO3)	288	HTC	1.3	mg/L		24-FEB-20	
pH	8.03		0.10	pH units		20-FEB-20	R4999478
Total Suspended Solids	5.4		2.0	mg/L	21-FEB-20	24-FEB-20	R5000807
Total Dissolved Solids	486	DLDS	20	mg/L		21-FEB-20	R5004855
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	168		10	mg/L		20-FEB-20	R4999478
Unionized ammonia	0.00184		0.00028	mg/L		24-FEB-20	
Ammonia, Total (as N)	0.65	DLHC	0.10	mg/L		21-FEB-20	R5001867
Bromide (Br)	1.59		0.10	mg/L		21-FEB-20	R5003307
Chloride (Cl)	65.4		0.50	mg/L		21-FEB-20	R5003307
Fluoride (F)	0.546		0.020	mg/L		21-FEB-20	R5003307
Nitrate (as N)	0.247		0.020	mg/L		21-FEB-20	R5003307
Nitrite (as N)	<0.010		0.010	mg/L		21-FEB-20	R5003307
Total Kjeldahl Nitrogen	1.14		0.15	mg/L	21-FEB-20	24-FEB-20	R5002674
Phosphorus, Total	0.0328		0.0030	mg/L	21-FEB-20	24-FEB-20	R5002473
Sulfate (SO4)	151		0.30	mg/L		21-FEB-20	R5003307
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		20-FEB-20	R4999318
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB	PEHR				20-FEB-20	R4999162
Dissolved Organic Carbon	4.41		0.50	mg/L	20-FEB-20	25-FEB-20	R5004852
Total Metals							
Aluminum (Al)-Total	0.406		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Antimony (Sb)-Total	0.00047		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Arsenic (As)-Total	0.00134		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Barium (Ba)-Total	0.0590		0.00020	mg/L	21-FEB-20	21-FEB-20	R4999655
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Boron (B)-Total	0.102		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Cadmium (Cd)-Total	<0.00020	DLM	0.00020	mg/L	21-FEB-20	21-FEB-20	R4999655
Calcium (Ca)-Total	78.0		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655
Cobalt (Co)-Total	0.00049		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Copper (Cu)-Total	0.0025		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Iron (Fe)-Total	0.415		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Lead (Pb)-Total	0.00053		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Magnesium (Mg)-Total	22.6		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Manganese (Mn)-Total	0.0299		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Mercury (Hg)-Total	0.000052		0.000050	mg/L		21-FEB-20	R4999526

* 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
L2418792-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 17-FEB-20 @ 10:00							
Matrix: WATER							
Total Metals							
Molybdenum (Mo)-Total	0.0731		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Nickel (Ni)-Total	0.00432		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Potassium (K)-Total	19.3		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Selenium (Se)-Total	0.00134		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Silicon (Si)-Total	2.38		0.10	mg/L	21-FEB-20	21-FEB-20	R4999655
Silver (Ag)-Total	0.000072		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Sodium (Na)-Total	44.9		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655
Strontium (Sr)-Total	0.614		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Thallium (Tl)-Total	0.000109		0.000010	mg/L	21-FEB-20	21-FEB-20	R4999655
Tin (Sn)-Total	0.00027		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Vanadium (V)-Total	0.00113		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Zinc (Zn)-Total	0.0082		0.0030	mg/L	21-FEB-20	21-FEB-20	R4999655
Speciated Metals							
Chromium, Hexavalent	0.00081		0.00050	mg/L		21-FEB-20	R4999530
Aggregate Organics							
COD	18		10	mg/L		27-FEB-20	R5010395
Phenols (4AAP)	0.0118		0.0010	mg/L		21-FEB-20	R5001907
Volatile Organic Compounds							
Acetone	<20		20	ug/L		23-FEB-20	R5001548
Benzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Bromodichloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromoform	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromomethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Carbon tetrachloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
Chlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dibromochloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroform	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,2-Dibromoethane	<0.20		0.20	ug/L		23-FEB-20	R5001548
1,2-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,3-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,4-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichlorodifluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,1-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,2-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichloromethane	<2.0		2.0	ug/L		23-FEB-20	R5001548
1,2-Dichloropropane	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548

* 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
L2418792-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 17-FEB-20 @ 10:00							
Matrix: WATER							
Volatile Organic Compounds							
Ethylbenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
n-Hexane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Methyl Ethyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
Methyl Isobutyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
MTBE	<0.50		0.50	ug/L		23-FEB-20	R5001548
Styrene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Tetrachloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Toluene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,2-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichlorofluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Vinyl chloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
o-Xylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
m+p-Xylenes	<1.0		1.0	ug/L		23-FEB-20	R5001548
Xylenes (Total)	<1.1		1.1	ug/L		23-FEB-20	
Surrogate: 4-Bromofluorobenzene	99.0		70-130	%		23-FEB-20	R5001548
Surrogate: 1,4-Difluorobenzene	98.7		70-130	%		23-FEB-20	R5001548
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		23-FEB-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005048
Surrogate: 2,4,6-Tribromophenol	163.7	RRR	40-150	%	24-FEB-20	26-FEB-20	R5005048
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Acenaphthylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)pyrene	<0.050		0.050	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(b)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(ghi)perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(k)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
4-Chloroaniline	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Chlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Chrysene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,3-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,4-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129

* 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
L2418792-1 EQ POND DISCHARGE Sampled By: CLIENT on 17-FEB-20 @ 10:00 Matrix: WATER							
Semi-Volatile Organics							
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dichlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Diethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dimethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dimethylphenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrophenol	<1.0		1.0	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,6-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluorene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobenzene	<0.040		0.040	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobutadiene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
1-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Naphthalene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pentachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Phenanthrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Surrogate: 2-Fluorobiphenyl	87.7		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: Nitrobenzene d5	101.0		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: p-Terphenyl d14	117.2		40-130	%	24-FEB-20	26-FEB-20	R5005129
Report Remarks : RRR: Surrogate recovery above ALS DQO. Non-detect sample results are considered reliable.							
Report Remarks : raised Cd LOR to remove potential Mo interference							
L2418792-2 WEST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:45 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.60		0.10	pH		21-FEB-20	R4999272
Temperature, Client	2.5		-50	Deg. C		21-FEB-20	R4999272
Physical Tests							
Conductivity	777		3.0	umhos/cm		20-FEB-20	R4999478
Hardness (as CaCO3)	289	HTC	1.3	mg/L		24-FEB-20	
pH	8.08		0.10	pH units		20-FEB-20	R4999478
Total Suspended Solids	5.9		2.0	mg/L	21-FEB-20	24-FEB-20	R5000807

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2418792-2 WEST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:45 Matrix: WATER							
Physical Tests							
Total Dissolved Solids	454	DLDS	20	mg/L		21-FEB-20	R5004855
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	128		10	mg/L		20-FEB-20	R4999478
Unionized ammonia	0.00325		0.00049	mg/L		24-FEB-20	
Ammonia, Total (as N)	0.66	DLHC	0.10	mg/L		21-FEB-20	R5001867
Bromide (Br)	1.56		0.10	mg/L		21-FEB-20	R5003307
Chloride (Cl)	65.4		0.50	mg/L		21-FEB-20	R5003307
Fluoride (F)	0.537		0.020	mg/L		21-FEB-20	R5003307
Nitrate (as N)	0.162		0.020	mg/L		21-FEB-20	R5003307
Nitrite (as N)	<0.010		0.010	mg/L		21-FEB-20	R5003307
Total Kjeldahl Nitrogen	1.10		0.15	mg/L	21-FEB-20	24-FEB-20	R5002674
Phosphorus, Total	0.0323		0.0030	mg/L	21-FEB-20	24-FEB-20	R5002473
Sulfate (SO4)	152		0.30	mg/L		21-FEB-20	R5003307
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		20-FEB-20	R4999318
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB	PEHR				20-FEB-20	R4999162
Dissolved Organic Carbon	5.13		0.50	mg/L	20-FEB-20	25-FEB-20	R5004852
Total Metals							
Aluminum (Al)-Total	0.461		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Antimony (Sb)-Total	0.00047		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Arsenic (As)-Total	0.00139		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Barium (Ba)-Total	0.0607		0.00020	mg/L	21-FEB-20	21-FEB-20	R4999655
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Boron (B)-Total	0.106		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Cadmium (Cd)-Total	<0.00020	DLM	0.00020	mg/L	21-FEB-20	21-FEB-20	R4999655
Calcium (Ca)-Total	77.9		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655
Cobalt (Co)-Total	0.00054		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Copper (Cu)-Total	0.0022		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Iron (Fe)-Total	0.395		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Lead (Pb)-Total	0.00062		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Magnesium (Mg)-Total	23.1		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Manganese (Mn)-Total	0.0394		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Mercury (Hg)-Total	0.0000052		0.0000050	mg/L		21-FEB-20	R4999526
Molybdenum (Mo)-Total	0.0730		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Nickel (Ni)-Total	0.00452		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Potassium (K)-Total	19.9		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Selenium (Se)-Total	0.00138		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Silicon (Si)-Total	2.55		0.10	mg/L	21-FEB-20	21-FEB-20	R4999655
Silver (Ag)-Total	<0.000050		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Sodium (Na)-Total	45.2		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2418792-2 WEST STORM WATER POND							
Sampled By: CLIENT on 17-FEB-20 @ 09:45							
Matrix: WATER							
Total Metals							
Strontium (Sr)-Total	0.614		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Thallium (Tl)-Total	0.000108		0.000010	mg/L	21-FEB-20	21-FEB-20	R4999655
Tin (Sn)-Total	0.00015		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Vanadium (V)-Total	0.00117		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Zinc (Zn)-Total	0.0072		0.0030	mg/L	21-FEB-20	21-FEB-20	R4999655
Speciated Metals							
Chromium, Hexavalent	0.00091		0.00050	mg/L		21-FEB-20	R4999530
Aggregate Organics							
COD	16		10	mg/L		27-FEB-20	R5010395
Phenols (4AAP)	0.0087		0.0010	mg/L		21-FEB-20	R5001907
Volatile Organic Compounds							
Acetone	<20		20	ug/L		23-FEB-20	R5001548
Benzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Bromodichloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromoform	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromomethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Carbon tetrachloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
Chlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dibromochloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroform	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,2-Dibromoethane	<0.20		0.20	ug/L		23-FEB-20	R5001548
1,2-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,3-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,4-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichlorodifluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,1-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,2-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichloromethane	<2.0		2.0	ug/L		23-FEB-20	R5001548
1,2-Dichloropropane	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Ethylbenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
n-Hexane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Methyl Ethyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
Methyl Isobutyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
MTBE	<0.50		0.50	ug/L		23-FEB-20	R5001548
Styrene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2418792-2 WEST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:45 Matrix: WATER							
Volatile Organic Compounds							
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Tetrachloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Toluene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,2-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichlorofluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Vinyl chloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
o-Xylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
m+p-Xylenes	<1.0		1.0	ug/L		23-FEB-20	R5001548
Xylenes (Total)	<1.1		1.1	ug/L		23-FEB-20	
Surrogate: 4-Bromofluorobenzene	94.7		70-130	%		23-FEB-20	R5001548
Surrogate: 1,4-Difluorobenzene	99.6		70-130	%		23-FEB-20	R5001548
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		23-FEB-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005048
Surrogate: 2,4,6-Tribromophenol	132.0		40-150	%	24-FEB-20	26-FEB-20	R5005048
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Acenaphthylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)pyrene	<0.050		0.050	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(b)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(ghi)perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(k)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
4-Chloroaniline	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Chlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Chrysene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,3-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,4-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dichlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Diethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dimethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dimethylphenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrophenol	<1.0		1.0	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2418792-2 WEST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:45 Matrix: WATER							
Semi-Volatile Organics							
2,6-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluorene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobenzene	<0.040		0.040	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobutadiene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
1-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Naphthalene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pentachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Phenanthrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Surrogate: 2-Fluorobiphenyl	75.4		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: Nitrobenzene d5	83.8		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: p-Terphenyl d14	107.5		40-130	%	24-FEB-20	26-FEB-20	R5005129
Report Remarks : raised Cd LOR to remove potential Mo interference							
L2418792-3 EAST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:30 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.86		0.10	pH		21-FEB-20	R4999272
Temperature, Client	2.5		-50	Deg. C		21-FEB-20	R4999272
Physical Tests							
Conductivity	807		3.0	umhos/cm		20-FEB-20	R4999478
Hardness (as CaCO3)	301	HTC	1.3	mg/L		24-FEB-20	
pH	8.12		0.10	pH units		20-FEB-20	R4999478
Total Suspended Solids	8.5		2.0	mg/L	21-FEB-20	24-FEB-20	R5000807
Total Dissolved Solids	486	DLDS	20	mg/L		21-FEB-20	R5004855
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	145		10	mg/L		20-FEB-20	R4999478
Unionized ammonia	0.00430		0.00044	mg/L		24-FEB-20	
Ammonia, Total (as N)	0.484	DLHC	0.050	mg/L		21-FEB-20	R5001867
Bromide (Br)	1.39		0.10	mg/L		21-FEB-20	R5003307
Chloride (Cl)	65.6		0.50	mg/L		21-FEB-20	R5003307
Fluoride (F)	0.512		0.020	mg/L		21-FEB-20	R5003307

* 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
L2418792-3 EAST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:30 Matrix: WATER							
Anions and Nutrients							
Nitrate (as N)	0.149		0.020	mg/L		21-FEB-20	R5003307
Nitrite (as N)	<0.010		0.010	mg/L		21-FEB-20	R5003307
Total Kjeldahl Nitrogen	0.90		0.15	mg/L	21-FEB-20	24-FEB-20	R5002674
Phosphorus, Total	0.0344		0.0030	mg/L	21-FEB-20	24-FEB-20	R5002473
Sulfate (SO4)	160		0.30	mg/L		21-FEB-20	R5003307
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		20-FEB-20	R4999318
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB	PEHR				20-FEB-20	R4999162
Dissolved Organic Carbon	4.80		0.50	mg/L	20-FEB-20	25-FEB-20	R5004852
Total Metals							
Aluminum (Al)-Total	0.433		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Antimony (Sb)-Total	0.00046		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Arsenic (As)-Total	0.00128		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Barium (Ba)-Total	0.0574		0.00020	mg/L	21-FEB-20	21-FEB-20	R4999655
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Boron (B)-Total	0.107		0.010	mg/L	21-FEB-20	21-FEB-20	R4999655
Cadmium (Cd)-Total	<0.00030	DLM	0.00030	mg/L	21-FEB-20	21-FEB-20	R4999655
Calcium (Ca)-Total	81.7		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655
Cobalt (Co)-Total	0.00071		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Copper (Cu)-Total	0.0024		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Iron (Fe)-Total	0.482		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Lead (Pb)-Total	0.00084		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Magnesium (Mg)-Total	23.5		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Manganese (Mn)-Total	0.0791		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Mercury (Hg)-Total	0.0000084		0.0000050	mg/L		21-FEB-20	R4999526
Molybdenum (Mo)-Total	0.0744		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Nickel (Ni)-Total	0.00455		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Potassium (K)-Total	19.4		0.050	mg/L	21-FEB-20	21-FEB-20	R4999655
Selenium (Se)-Total	0.00130		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Silicon (Si)-Total	2.62		0.10	mg/L	21-FEB-20	21-FEB-20	R4999655
Silver (Ag)-Total	<0.000050		0.000050	mg/L	21-FEB-20	21-FEB-20	R4999655
Sodium (Na)-Total	43.0		0.50	mg/L	21-FEB-20	21-FEB-20	R4999655
Strontium (Sr)-Total	0.644		0.0010	mg/L	21-FEB-20	21-FEB-20	R4999655
Thallium (Tl)-Total	0.000117		0.000010	mg/L	21-FEB-20	21-FEB-20	R4999655
Tin (Sn)-Total	0.00021		0.00010	mg/L	21-FEB-20	21-FEB-20	R4999655
Vanadium (V)-Total	0.00114		0.00050	mg/L	21-FEB-20	21-FEB-20	R4999655
Zinc (Zn)-Total	0.0086		0.0030	mg/L	21-FEB-20	21-FEB-20	R4999655
Speciated Metals							
Chromium, Hexavalent	0.00082		0.00050	mg/L		21-FEB-20	R4999530
Aggregate Organics							

* 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
L2418792-3 EAST STORM WATER POND							
Sampled By: CLIENT on 17-FEB-20 @ 09:30							
Matrix: WATER							
Aggregate Organics							
COD	15		10	mg/L		27-FEB-20	R5010395
Phenols (4AAP)	0.0053		0.0010	mg/L		21-FEB-20	R5001907
Volatile Organic Compounds							
Acetone	<20		20	ug/L		23-FEB-20	R5001548
Benzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Bromodichloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromoform	<1.0		1.0	ug/L		23-FEB-20	R5001548
Bromomethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Carbon tetrachloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
Chlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dibromochloromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
Chloroform	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,2-Dibromoethane	<0.20		0.20	ug/L		23-FEB-20	R5001548
1,2-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,3-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,4-Dichlorobenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichlorodifluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548
1,1-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,2-Dichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Dichloromethane	<2.0		2.0	ug/L		23-FEB-20	R5001548
1,2-Dichloropropane	<0.50		0.50	ug/L		23-FEB-20	R5001548
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Ethylbenzene	<0.50		0.50	ug/L		23-FEB-20	R5001548
n-Hexane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Methyl Ethyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
Methyl Isobutyl Ketone	<20		20	ug/L		23-FEB-20	R5001548
MTBE	<0.50		0.50	ug/L		23-FEB-20	R5001548
Styrene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Tetrachloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Toluene	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,1-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
1,1,2-Trichloroethane	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichloroethylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
Trichlorofluoromethane	<1.0		1.0	ug/L		23-FEB-20	R5001548

* 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
L2418792-3 EAST STORM WATER POND							
Sampled By: CLIENT on 17-FEB-20 @ 09:30							
Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		23-FEB-20	R5001548
o-Xylene	<0.50		0.50	ug/L		23-FEB-20	R5001548
m+p-Xylenes	<1.0		1.0	ug/L		23-FEB-20	R5001548
Xylenes (Total)	<1.1		1.1	ug/L		23-FEB-20	
Surrogate: 4-Bromofluorobenzene	96.0		70-130	%		23-FEB-20	R5001548
Surrogate: 1,4-Difluorobenzene	99.3		70-130	%		23-FEB-20	R5001548
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		23-FEB-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005048
Surrogate: 2,4,6-Tribromophenol	129.8		40-150	%	24-FEB-20	26-FEB-20	R5005048
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Acenaphthylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(a)pyrene	<0.050		0.050	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(b)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(ghi)perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Benzo(k)fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
4-Chloroaniline	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Chlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Chrysene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,3-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
1,4-Dichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dichlorophenol	<0.30		0.30	ug/L	24-FEB-20	26-FEB-20	R5005129
Diethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Dimethylphthalate	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dimethylphenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrophenol	<1.0		1.0	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,6-Dinitrotoluene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluoranthene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Fluorene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobenzene	<0.040		0.040	ug/L	24-FEB-20	26-FEB-20	R5005129
Hexachlorobutadiene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129

* 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
L2418792-3 EAST STORM WATER POND Sampled By: CLIENT on 17-FEB-20 @ 09:30 Matrix: WATER							
Semi-Volatile Organics							
1-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2-Methylnaphthalene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
Naphthalene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pentachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Perylene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Phenanthrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
Pyrene	<0.20		0.20	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	24-FEB-20	26-FEB-20	R5005129
Surrogate: 2-Fluorobiphenyl	74.6		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: Nitrobenzene d5	78.9		40-130	%	24-FEB-20	26-FEB-20	R5005129
Surrogate: p-Terphenyl d14	97.2		40-130	%	24-FEB-20	26-FEB-20	R5005129
Report Remarks : raised Cd LOR to remove potential Mo interference							

* 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	Bromide (Br)	MS-B	L2418792-1, -2, -3
Matrix Spike	Chromium, Hexavalent	MS-B	L2418792-1, -2, -3
Matrix Spike	Aluminum (Al)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Boron (B)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Calcium (Ca)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Iron (Fe)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Manganese (Mn)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Potassium (K)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Silicon (Si)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Ammonia, Total (as N)	MS-B	L2418792-1, -2, -3
Matrix Spike	Phosphorus, Total	MS-B	L2418792-1, -2, -3
Matrix Spike	Sulfate (SO4)	MS-B	L2418792-1, -2, -3

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
PEHR	Parameter Exceeded Recommended Holding Time On Receipt: Proceed With Analysis As Requested.
RRR	Refer to Report Remarks for issues regarding this analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
625-ACID-EXTRA-WT	Water	EPA 8270 Acid Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-WT	Water	EPA 8270 Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
N-nitrosodiphenylamine is reported as diphenylamine. N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine. (EPA 8270D)			
ALK-WT	Water	Alkalinity, Total (as CaCO3)	EPA 310.2
This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
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).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
Chemical Oxygen Demand		APHA 5220 D	

Reference Information

COD-T-WT Water

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

CR-CR6-IC-WT Water Chromium +6 EPA 7199

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. 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).

DOC-WT Water Dissolved Organic Carbon APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

EC-SCREEN-WT Water Conductivity Screen (Internal Use Only) APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT Water Conductivity APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-NH3-UNION-CLI-WT Water Un-ionized ammonia CALCULATION

F-IC-N-WT Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-WT Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

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

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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).

NH3-F-WT Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH,TEMP-CLIENT-WT Water pH & Temperature Results supplied by client

PH-WT Water pH APHA 4500 H-Electrode

Reference Information

Water samples are analyzed directly by a calibrated pH meter.

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). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
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An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
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A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.

THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
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Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
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This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
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Aqueous samples are analyzed by headspace-GC/MS.

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

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: L2418792

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-ACID-EXTRA-WT	Water							
Batch	R5005048							
WG3280781-2 LCS								
2,3,6-Trichlorophenol			81.2		%		50-130	25-FEB-20
WG3280781-1 MB								
2,3,6-Trichlorophenol			<0.20		ug/L		0.2	25-FEB-20
Surrogate: 2,4,6-Tribromophenol			98.4		%		40-150	25-FEB-20
625-WT	Water							
Batch	R5005129							
WG3280781-2 LCS								
1-Methylnaphthalene			86.9		%		50-140	25-FEB-20
1,2-Dichlorobenzene			70.0		%		40-130	25-FEB-20
1,2,4-Trichlorobenzene			66.0		%		50-130	25-FEB-20
1,3-Dichlorobenzene			61.6		%		50-140	25-FEB-20
1,4-Dichlorobenzene			68.2		%		40-130	25-FEB-20
2-Chlorophenol			81.5		%		65-130	25-FEB-20
2-Methylnaphthalene			86.0		%		50-140	25-FEB-20
2,3,4,5-Tetrachlorophenol			116.2		%		50-130	25-FEB-20
2,3,4,6-Tetrachlorophenol			110.4		%		65-130	25-FEB-20
2,4-Dichlorophenol			95.9		%		65-130	25-FEB-20
2,4-Dimethylphenol			87.8		%		30-130	25-FEB-20
2,4-Dinitrophenol			116.3		%		40-140	26-FEB-20
2,4-Dinitrotoluene			115.3		%		50-140	25-FEB-20
2,4,5-Trichlorophenol			106.1		%		65-130	25-FEB-20
2,4,6-Trichlorophenol			99.6		%		65-130	25-FEB-20
2,6-Dinitrotoluene			102.0		%		50-140	25-FEB-20
3,3'-Dichlorobenzidine			73.2		%		50-140	25-FEB-20
4-Chloroaniline			52.7		%		30-140	25-FEB-20
Acenaphthene			84.6		%		50-140	25-FEB-20
Acenaphthylene			81.7		%		50-140	25-FEB-20
Anthracene			92.1		%		50-140	25-FEB-20
Benzo(a)anthracene			112.1		%		50-140	25-FEB-20
Benzo(a)pyrene			101.2		%		60-130	25-FEB-20
Benzo(b)fluoranthene			110.3		%		50-140	25-FEB-20
Benzo(ghi)perylene			103.6		%		50-140	25-FEB-20
Benzo(k)fluoranthene			95.2		%		50-140	25-FEB-20
Bis(2-chloroethyl)ether			82.7		%		50-140	25-FEB-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-WT	Water							
Batch	R5005129							
WG3280781-2 LCS								
Bis(2-ethylhexyl)phthalate			120.6		%		50-140	25-FEB-20
Chrysene			104.8		%		50-140	25-FEB-20
Dibenzo(a,h)anthracene			108.0		%		50-140	25-FEB-20
Diethylphthalate			96.4		%		50-140	25-FEB-20
Dimethylphthalate			94.9		%		50-140	25-FEB-20
Fluoranthene			102.9		%		50-140	25-FEB-20
Fluorene			85.9		%		50-140	25-FEB-20
Hexachlorobenzene			81.1		%		40-130	25-FEB-20
Hexachlorobutadiene			49.4		%		40-130	25-FEB-20
Indeno(1,2,3-cd)pyrene			109.1		%		50-140	25-FEB-20
Naphthalene			79.9		%		50-140	25-FEB-20
Pentachlorophenol			111.4		%		60-130	26-FEB-20
Perylene			91.5		%		50-140	25-FEB-20
Phenanthrene			92.0		%		50-140	25-FEB-20
Pyrene			99.7		%		50-140	25-FEB-20
WG3280781-1 MB								
1-Methylnaphthalene			<0.40		ug/L		0.4	25-FEB-20
1,2-Dichlorobenzene			<0.40		ug/L		0.4	25-FEB-20
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	25-FEB-20
1,3-Dichlorobenzene			<0.40		ug/L		0.4	25-FEB-20
1,4-Dichlorobenzene			<0.40		ug/L		0.4	25-FEB-20
2-Chlorophenol			<0.30		ug/L		0.3	25-FEB-20
2-Methylnaphthalene			<0.40		ug/L		0.4	25-FEB-20
2,3,4,5-Tetrachlorophenol			<0.50		ug/L		0.5	25-FEB-20
2,3,4,6-Tetrachlorophenol			<0.50		ug/L		0.5	25-FEB-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	25-FEB-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	25-FEB-20
2,4-Dinitrophenol			<1.0		ug/L		1	25-FEB-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	25-FEB-20
2,4,5-Trichlorophenol			<0.50		ug/L		0.5	25-FEB-20
2,4,6-Trichlorophenol			<0.50		ug/L		0.5	25-FEB-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	25-FEB-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	25-FEB-20
4-Chloroaniline			<0.40		ug/L		0.4	25-FEB-20



Environmental

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-WT		Water						
Batch	R5005129							
WG3280781-1	MB							
Acenaphthene			<0.20		ug/L		0.2	25-FEB-20
Acenaphthylene			<0.20		ug/L		0.2	25-FEB-20
Anthracene			<0.20		ug/L		0.2	25-FEB-20
Benzo(a)anthracene			<0.20		ug/L		0.2	25-FEB-20
Benzo(a)pyrene			<0.050		ug/L		0.05	25-FEB-20
Benzo(b)fluoranthene			<0.20		ug/L		0.2	25-FEB-20
Benzo(ghi)perylene			<0.20		ug/L		0.2	25-FEB-20
Benzo(k)fluoranthene			<0.20		ug/L		0.2	25-FEB-20
Bis(2-chloroethyl)ether			<0.40		ug/L		0.4	25-FEB-20
Bis(2-ethylhexyl)phthalate			<1.0		ug/L		1	25-FEB-20
Chrysene			<0.20		ug/L		0.2	25-FEB-20
Dibenzo(a,h)anthracene			<0.20		ug/L		0.2	25-FEB-20
Diethylphthalate			<0.20		ug/L		0.2	25-FEB-20
Dimethylphthalate			<0.20		ug/L		0.2	25-FEB-20
Fluoranthene			<0.20		ug/L		0.2	25-FEB-20
Fluorene			<0.20		ug/L		0.2	25-FEB-20
Hexachlorobenzene			<0.040		ug/L		0.04	25-FEB-20
Hexachlorobutadiene			<0.20		ug/L		0.2	25-FEB-20
Indeno(1,2,3-cd)pyrene			<0.20		ug/L		0.2	25-FEB-20
Naphthalene			<0.20		ug/L		0.2	25-FEB-20
Pentachlorophenol			<0.50		ug/L		0.5	25-FEB-20
Perylene			<0.20		ug/L		0.2	25-FEB-20
Phenanthrene			<0.20		ug/L		0.2	25-FEB-20
Pyrene			<0.20		ug/L		0.2	25-FEB-20
Surrogate: 2-Fluorobiphenyl			79.1		%		40-130	25-FEB-20
Surrogate: Nitrobenzene d5			91.5		%		40-130	25-FEB-20
Surrogate: p-Terphenyl d14			123.9		%		40-130	25-FEB-20
ALK-WT		Water						
Batch	R4999478							
WG3278665-4	DUP	WG3278665-3						
Alkalinity, Total (as CaCO3)		204	202		mg/L	1.2	20	20-FEB-20
WG3278665-2	LCS							
Alkalinity, Total (as CaCO3)			100.9		%		85-115	20-FEB-20
WG3278665-1	MB							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT Water								
Batch	R4999478							
WG3278665-1	MB							
Alkalinity, Total (as CaCO3)			<10		mg/L		10	20-FEB-20
BR-IC-N-WT Water								
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Bromide (Br)		1.39	1.39		mg/L	0.1	20	21-FEB-20
WG3279439-2	LCS							
Bromide (Br)			101.9		%		85-115	21-FEB-20
WG3279439-1	MB							
Bromide (Br)			<0.10		mg/L		0.1	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Bromide (Br)			N/A	MS-B	%		-	21-FEB-20
CL-IC-N-WT Water								
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Chloride (Cl)		65.6	65.6		mg/L	0.0	20	21-FEB-20
WG3279439-2	LCS							
Chloride (Cl)			99.2		%		90-110	21-FEB-20
WG3279439-1	MB							
Chloride (Cl)			<0.50		mg/L		0.5	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Chloride (Cl)			94.7		%		75-125	21-FEB-20
CN-TOT-WT Water								
Batch	R4999318							
WG3278703-3	DUP	L2418792-1						
Cyanide, Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	20-FEB-20
WG3278703-2	LCS							
Cyanide, Total			99.3		%		80-120	20-FEB-20
WG3278703-1	MB							
Cyanide, Total			<0.0020		mg/L		0.002	20-FEB-20
WG3278703-4	MS	L2418792-1						
Cyanide, Total			96.2		%		70-130	20-FEB-20
COD-T-WT Water								



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 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
COD-T-WT								
	Water							
Batch	R5010395							
WG3282641-3	DUP	L2418792-1						
COD		18	17		mg/L	7.3	20	27-FEB-20
WG3282641-2	LCS		96.4		%		85-115	27-FEB-20
COD								
WG3282641-1	MB		<10		mg/L		10	27-FEB-20
COD								
WG3282641-4	MS	L2418792-1	92.3		%		75-125	27-FEB-20
COD								
CR-CR6-IC-WT								
	Water							
Batch	R4999530							
WG3279452-4	DUP	WG3279452-3						
Chromium, Hexavalent		0.118	0.111		mg/L	6.0	20	21-FEB-20
WG3279452-2	LCS		97.9		%		80-120	21-FEB-20
Chromium, Hexavalent								
WG3279452-1	MB		<0.00050		mg/L		0.0005	21-FEB-20
Chromium, Hexavalent								
WG3279452-5	MS	WG3279452-3	N/A	MS-B	%		-	21-FEB-20
Chromium, Hexavalent								
DOC-WT								
	Water							
Batch	R5004852							
WG3278944-3	DUP	L2418865-2						
Dissolved Organic Carbon		1.17	1.11		mg/L	5.3	20	25-FEB-20
WG3278944-2	LCS		95.3		%		80-120	25-FEB-20
Dissolved Organic Carbon								
WG3278944-1	MB		<0.50		mg/L		0.5	25-FEB-20
Dissolved Organic Carbon								
WG3278944-4	MS	L2418865-2	99.8		%		70-130	25-FEB-20
Dissolved Organic Carbon								
EC-WT								
	Water							
Batch	R4999478							
WG3278665-4	DUP	WG3278665-3						
Conductivity		427	430		umhos/cm	0.7	10	20-FEB-20
WG3278665-2	LCS		100.5		%		90-110	20-FEB-20
Conductivity								
WG3278665-1	MB		<3.0		umhos/cm		3	20-FEB-20
Conductivity								
F-IC-N-WT								
	Water							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Fluoride (F)		0.513	0.513		mg/L	0.1	20	21-FEB-20
WG3279439-2	LCS							
Fluoride (F)			100.2		%		90-110	21-FEB-20
WG3279439-1	MB							
Fluoride (F)			<0.020		mg/L		0.02	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Fluoride (F)			96.6		%		75-125	21-FEB-20
HG-T-CVAA-WT		Water						
Batch	R4999526							
WG3279188-4	DUP	WG3279188-3						
Mercury (Hg)-Total		0.0000052	<0.0000050	RPD-NA	mg/L	N/A	20	21-FEB-20
WG3279188-2	LCS							
Mercury (Hg)-Total			98.4		%		80-120	21-FEB-20
WG3279188-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	21-FEB-20
WG3279188-6	MS	WG3279188-5						
Mercury (Hg)-Total			95.8		%		70-130	21-FEB-20
MET-T-CCMS-WT		Water						
Batch	R4999655							
WG3279076-4	DUP	WG3279076-3						
Aluminum (Al)-Total		0.406	0.393		mg/L	3.3	20	21-FEB-20
Antimony (Sb)-Total		0.00047	0.00046		mg/L	2.7	20	21-FEB-20
Arsenic (As)-Total		0.00134	0.00129		mg/L	3.8	20	21-FEB-20
Barium (Ba)-Total		0.0590	0.0575		mg/L	2.5	20	21-FEB-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	21-FEB-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	21-FEB-20
Boron (B)-Total		0.102	0.106		mg/L	3.1	20	21-FEB-20
Cadmium (Cd)-Total		0.000172	0.000169		mg/L	2.1	20	21-FEB-20
Calcium (Ca)-Total		78.0	78.1		mg/L	0.1	20	21-FEB-20
Cobalt (Co)-Total		0.00049	0.00050		mg/L	2.8	20	21-FEB-20
Copper (Cu)-Total		0.00249	0.00216		mg/L	14	20	21-FEB-20
Iron (Fe)-Total		0.415	0.349		mg/L	17	20	21-FEB-20
Lead (Pb)-Total		0.000566	0.000527		mg/L	7.1	20	21-FEB-20
Magnesium (Mg)-Total		22.6	22.2		mg/L	1.7	20	21-FEB-20
Manganese (Mn)-Total		0.0299	0.0281		mg/L	6.2	20	21-FEB-20



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Workorder: L2418792

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4999655							
WG3279076-4	DUP	WG3279076-3						
Molybdenum (Mo)-Total		0.0731	0.0724		mg/L	0.9	20	21-FEB-20
Nickel (Ni)-Total		0.00432	0.00442		mg/L	2.3	20	21-FEB-20
Potassium (K)-Total		19.3	19.5		mg/L	0.5	20	21-FEB-20
Selenium (Se)-Total		0.00134	0.00133		mg/L	1.3	20	21-FEB-20
Silicon (Si)-Total		2.38	2.33		mg/L	2.1	20	21-FEB-20
Silver (Ag)-Total		0.000072	0.000071		mg/L	1.7	20	21-FEB-20
Sodium (Na)-Total		44.9	43.9		mg/L	2.4	20	21-FEB-20
Strontium (Sr)-Total		0.614	0.607		mg/L	1.1	20	21-FEB-20
Thallium (Tl)-Total		0.000109	0.000109		mg/L	0.1	20	21-FEB-20
Tin (Sn)-Total		0.00029	0.00024		mg/L	16	20	21-FEB-20
Vanadium (V)-Total		0.00113	0.00101		mg/L	11	20	21-FEB-20
Zinc (Zn)-Total		0.0082	0.0066	J	mg/L	0.0015	0.006	21-FEB-20
WG3279076-2	LCS							
Aluminum (Al)-Total			107.0		%		80-120	21-FEB-20
Antimony (Sb)-Total			103.0		%		80-120	21-FEB-20
Arsenic (As)-Total			99.8		%		80-120	21-FEB-20
Barium (Ba)-Total			105.6		%		80-120	21-FEB-20
Beryllium (Be)-Total			94.8		%		80-120	21-FEB-20
Bismuth (Bi)-Total			99.3		%		80-120	21-FEB-20
Boron (B)-Total			100.4		%		80-120	21-FEB-20
Cadmium (Cd)-Total			97.8		%		80-120	21-FEB-20
Calcium (Ca)-Total			102.9		%		80-120	21-FEB-20
Cobalt (Co)-Total			97.0		%		80-120	21-FEB-20
Copper (Cu)-Total			93.2		%		80-120	21-FEB-20
Iron (Fe)-Total			96.2		%		80-120	21-FEB-20
Lead (Pb)-Total			100.7		%		80-120	21-FEB-20
Magnesium (Mg)-Total			103.1		%		80-120	21-FEB-20
Manganese (Mn)-Total			103.1		%		80-120	21-FEB-20
Molybdenum (Mo)-Total			100.1		%		80-120	21-FEB-20
Nickel (Ni)-Total			98.5		%		80-120	21-FEB-20
Potassium (K)-Total			107.4		%		80-120	21-FEB-20
Selenium (Se)-Total			95.9		%		80-120	21-FEB-20
Silicon (Si)-Total			103.1		%		60-140	21-FEB-20



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R4999655							
WG3279076-2	LCS							
Silver (Ag)-Total			102.7		%		80-120	21-FEB-20
Sodium (Na)-Total			101.0		%		80-120	21-FEB-20
Strontium (Sr)-Total			102.7		%		80-120	21-FEB-20
Thallium (Tl)-Total			99.4		%		80-120	21-FEB-20
Tin (Sn)-Total			101.6		%		80-120	21-FEB-20
Vanadium (V)-Total			103.3		%		80-120	21-FEB-20
Zinc (Zn)-Total			97.3		%		80-120	21-FEB-20
WG3279076-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	21-FEB-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	21-FEB-20
Boron (B)-Total			<0.010		mg/L		0.01	21-FEB-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	21-FEB-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	21-FEB-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	21-FEB-20
Iron (Fe)-Total			<0.010		mg/L		0.01	21-FEB-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	21-FEB-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	21-FEB-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	21-FEB-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	21-FEB-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	21-FEB-20
Potassium (K)-Total			<0.050		mg/L		0.05	21-FEB-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	21-FEB-20
Silicon (Si)-Total			<0.10		mg/L		0.1	21-FEB-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	21-FEB-20
Sodium (Na)-Total			<0.050		mg/L		0.05	21-FEB-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	21-FEB-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	21-FEB-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	21-FEB-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	21-FEB-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R4999655							
WG3279076-1	MB							
Zinc (Zn)-Total			<0.0030		mg/L		0.003	21-FEB-20
WG3279076-5	MS	WG3279076-3						
Aluminum (Al)-Total			N/A	MS-B	%		-	21-FEB-20
Antimony (Sb)-Total			101.1		%		70-130	21-FEB-20
Arsenic (As)-Total			98.8		%		70-130	21-FEB-20
Barium (Ba)-Total			N/A	MS-B	%		-	21-FEB-20
Beryllium (Be)-Total			92.1		%		70-130	21-FEB-20
Bismuth (Bi)-Total			87.8		%		70-130	21-FEB-20
Boron (B)-Total			N/A	MS-B	%		-	21-FEB-20
Cadmium (Cd)-Total			95.5		%		70-130	21-FEB-20
Calcium (Ca)-Total			N/A	MS-B	%		-	21-FEB-20
Cobalt (Co)-Total			91.8		%		70-130	21-FEB-20
Copper (Cu)-Total			78.0		%		70-130	21-FEB-20
Iron (Fe)-Total			N/A	MS-B	%		-	21-FEB-20
Lead (Pb)-Total			88.4		%		70-130	21-FEB-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	21-FEB-20
Manganese (Mn)-Total			N/A	MS-B	%		-	21-FEB-20
Molybdenum (Mo)-Total			N/A	MS-B	%		-	21-FEB-20
Nickel (Ni)-Total			95.4		%		70-130	21-FEB-20
Potassium (K)-Total			N/A	MS-B	%		-	21-FEB-20
Selenium (Se)-Total			94.0		%		70-130	21-FEB-20
Silicon (Si)-Total			N/A	MS-B	%		-	21-FEB-20
Silver (Ag)-Total			93.6		%		70-130	21-FEB-20
Sodium (Na)-Total			N/A	MS-B	%		-	21-FEB-20
Strontium (Sr)-Total			N/A	MS-B	%		-	21-FEB-20
Thallium (Tl)-Total			88.4		%		70-130	21-FEB-20
Tin (Sn)-Total			100.6		%		70-130	21-FEB-20
Vanadium (V)-Total			104.6		%		70-130	21-FEB-20
Zinc (Zn)-Total			81.6		%		70-130	21-FEB-20
NH3-F-WT								
	Water							
Batch	R5001867							
WG3279014-3	DUP	L2419141-1						
Ammonia, Total (as N)		0.622	0.648		mg/L	4.1	20	21-FEB-20
WG3279014-2	LCS							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT								
Water								
Batch	R5001867							
WG3279014-2	LCS							
Ammonia, Total (as N)			105.1		%		85-115	21-FEB-20
WG3279014-1	MB							
Ammonia, Total (as N)			<0.010		mg/L		0.01	21-FEB-20
WG3279014-4	MS	L2419141-1						
Ammonia, Total (as N)			N/A	MS-B	%		-	21-FEB-20
NO2-IC-WT								
Water								
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	21-FEB-20
WG3279439-2	LCS							
Nitrite (as N)			98.1		%		90-110	21-FEB-20
WG3279439-1	MB							
Nitrite (as N)			<0.010		mg/L		0.01	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Nitrite (as N)			96.1		%		75-125	21-FEB-20
NO3-IC-WT								
Water								
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Nitrate (as N)		0.149	0.149		mg/L	0.3	20	21-FEB-20
WG3279439-2	LCS							
Nitrate (as N)			98.6		%		90-110	21-FEB-20
WG3279439-1	MB							
Nitrate (as N)			<0.020		mg/L		0.02	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Nitrate (as N)			94.3		%		75-125	21-FEB-20
P-T-COL-WT								
Water								
Batch	R5002473							
WG3278986-3	DUP	L2419125-3						
Phosphorus, Total		1.06	1.04		mg/L	1.6	20	24-FEB-20
WG3278986-2	LCS							
Phosphorus, Total			99.2		%		80-120	24-FEB-20
WG3278986-1	MB							
Phosphorus, Total			<0.0030		mg/L		0.003	24-FEB-20
WG3278986-4	MS	L2419125-3						
Phosphorus, Total			N/A	MS-B	%		-	24-FEB-20
PH-WT								
Water								



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT		Water						
Batch	R4999478							
WG3278665-4	DUP	WG3278665-3						
pH		8.47	8.42	J	pH units	0.05	0.2	20-FEB-20
WG3278665-2	LCS							
pH			7.07		pH units		6.9-7.1	20-FEB-20
PHENOLS-4AAP-WT		Water						
Batch	R5001907							
WG3279012-3	DUP	L2418296-3						
Phenols (4AAP)		0.0020	0.0023		mg/L	11	20	21-FEB-20
WG3279012-2	LCS							
Phenols (4AAP)			96.0		%		85-115	21-FEB-20
WG3279012-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	21-FEB-20
WG3279012-4	MS	L2418296-3						
Phenols (4AAP)			92.8		%		75-125	21-FEB-20
SO4-IC-N-WT		Water						
Batch	R5003307							
WG3279439-4	DUP	WG3279439-3						
Sulfate (SO4)		159	160		mg/L	0.3	20	21-FEB-20
WG3279439-2	LCS							
Sulfate (SO4)			99.9		%		90-110	21-FEB-20
WG3279439-1	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	21-FEB-20
WG3279439-5	MS	WG3279439-3						
Sulfate (SO4)			N/A	MS-B	%		-	21-FEB-20
SOLIDS-TDS-WT		Water						
Batch	R5004855							
WG3279516-3	DUP	L2417198-1						
Total Dissolved Solids		722	691		mg/L	4.3	20	21-FEB-20
WG3279516-2	LCS							
Total Dissolved Solids			100.6		%		85-115	21-FEB-20
WG3279516-1	MB							
Total Dissolved Solids			<10		mg/L		10	21-FEB-20
SOLIDS-TSS-WT		Water						
Batch	R5000807							
WG3279168-3	DUP	L2417749-1						
Total Suspended Solids		1710	1670		mg/L	2.1	20	24-FEB-20
WG3279168-2	LCS							



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Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-WT		Water						
Batch	R5000807							
WG3279168-2	LCS							
Total Suspended Solids			99.2		%		85-115	24-FEB-20
WG3279168-1	MB							
Total Suspended Solids			<2.0		mg/L		2	24-FEB-20
TKN-WT		Water						
Batch	R5002674							
WG3279010-3	DUP	L2418296-4						
Total Kjeldahl Nitrogen		0.34	0.31		mg/L	8.9	20	24-FEB-20
WG3279010-2	LCS							
Total Kjeldahl Nitrogen			103.1		%		75-125	24-FEB-20
WG3279010-1	MB							
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	24-FEB-20
WG3279010-4	MS	L2418296-4						
Total Kjeldahl Nitrogen			101.8		%		70-130	24-FEB-20
VOC-ROU-HS-WT		Water						
Batch	R5001548							
WG3279480-4	DUP	WG3279480-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	23-FEB-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	23-FEB-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	23-FEB-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5001548							
WG3279480-4	DUP	WG3279480-3						
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
cis-1,2-Dichloroethylene		3.01	3.03		ug/L	0.7	30	23-FEB-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	23-FEB-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	23-FEB-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	23-FEB-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	23-FEB-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	23-FEB-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	23-FEB-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	23-FEB-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	23-FEB-20
Vinyl chloride		5.65	5.89		ug/L	4.2	30	23-FEB-20
WG3279480-1	LCS							
1,1,1,2-Tetrachloroethane			97.6		%		70-130	23-FEB-20
1,1,2,2-Tetrachloroethane			98.0		%		70-130	23-FEB-20
1,1,1-Trichloroethane			100.7		%		70-130	23-FEB-20
1,1,2-Trichloroethane			96.8		%		70-130	23-FEB-20
1,2-Dibromoethane			95.9		%		70-130	23-FEB-20
1,1-Dichloroethane			105.2		%		70-130	23-FEB-20
1,1-Dichloroethylene			98.8		%		70-130	23-FEB-20
1,2-Dichlorobenzene			100.5		%		70-130	23-FEB-20
1,2-Dichloroethane			103.0		%		70-130	23-FEB-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5001548							
WG3279480-1	LCS							
1,2-Dichloropropane			106.7		%		70-130	23-FEB-20
1,3-Dichlorobenzene			99.0		%		70-130	23-FEB-20
1,4-Dichlorobenzene			99.5		%		70-130	23-FEB-20
Acetone			110.0		%		60-140	23-FEB-20
Benzene			105.0		%		70-130	23-FEB-20
Bromodichloromethane			105.9		%		70-130	23-FEB-20
Bromoform			93.2		%		70-130	23-FEB-20
Bromomethane			88.6		%		60-140	23-FEB-20
Carbon tetrachloride			104.0		%		70-130	23-FEB-20
Chlorobenzene			100.3		%		70-130	23-FEB-20
Chloroethane			110.6		%		70-130	23-FEB-20
Chloroform			104.3		%		70-130	23-FEB-20
cis-1,2-Dichloroethylene			98.4		%		70-130	23-FEB-20
cis-1,3-Dichloropropene			93.1		%		70-130	23-FEB-20
Dibromochloromethane			94.2		%		70-130	23-FEB-20
Dichlorodifluoromethane			101.5		%		50-140	23-FEB-20
Dichloromethane			103.9		%		70-130	23-FEB-20
Ethylbenzene			100.6		%		70-130	23-FEB-20
m+p-Xylenes			101.7		%		70-130	23-FEB-20
Methyl Ethyl Ketone			102.3		%		60-140	23-FEB-20
Methyl Isobutyl Ketone			104.8		%		50-150	23-FEB-20
n-Hexane			95.1		%		70-130	23-FEB-20
MTBE			101.4		%		70-130	23-FEB-20
o-Xylene			110.3		%		70-130	23-FEB-20
Styrene			95.3		%		70-130	23-FEB-20
Tetrachloroethylene			95.0		%		70-130	23-FEB-20
Toluene			102.0		%		70-130	23-FEB-20
trans-1,2-Dichloroethylene			101.7		%		70-130	23-FEB-20
trans-1,3-Dichloropropene			98.0		%		70-130	23-FEB-20
Trichloroethylene			98.3		%		70-130	23-FEB-20
Trichlorofluoromethane			100.0		%		60-140	23-FEB-20
Vinyl chloride			118.1		%		60-140	23-FEB-20
WG3279480-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	23-FEB-20



Quality Control Report

Workorder: L2418792

Report Date: 27-FEB-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5001548							
WG3279480-2 MB								
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	23-FEB-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	23-FEB-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	23-FEB-20
1,2-Dibromoethane			<0.20		ug/L		0.2	23-FEB-20
1,1-Dichloroethane			<0.50		ug/L		0.5	23-FEB-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	23-FEB-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	23-FEB-20
1,2-Dichloroethane			<0.50		ug/L		0.5	23-FEB-20
1,2-Dichloropropane			<0.50		ug/L		0.5	23-FEB-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	23-FEB-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	23-FEB-20
Acetone			<20		ug/L		20	23-FEB-20
Benzene			<0.50		ug/L		0.5	23-FEB-20
Bromodichloromethane			<1.0		ug/L		1	23-FEB-20
Bromoform			<1.0		ug/L		1	23-FEB-20
Bromomethane			<0.50		ug/L		0.5	23-FEB-20
Carbon tetrachloride			<0.20		ug/L		0.2	23-FEB-20
Chlorobenzene			<0.50		ug/L		0.5	23-FEB-20
Chloroethane			<1.0		ug/L		1	23-FEB-20
Chloroform			<1.0		ug/L		1	23-FEB-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	23-FEB-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	23-FEB-20
Dibromochloromethane			<1.0		ug/L		1	23-FEB-20
Dichlorodifluoromethane			<1.0		ug/L		1	23-FEB-20
Dichloromethane			<2.0		ug/L		2	23-FEB-20
Ethylbenzene			<0.50		ug/L		0.5	23-FEB-20
m+p-Xylenes			<0.40		ug/L		0.4	23-FEB-20
Methyl Ethyl Ketone			<20		ug/L		20	23-FEB-20
Methyl Isobutyl Ketone			<20		ug/L		20	23-FEB-20
n-Hexane			<0.50		ug/L		0.5	23-FEB-20
MTBE			<0.50		ug/L		0.5	23-FEB-20
o-Xylene			<0.30		ug/L		0.3	23-FEB-20
Styrene			<0.50		ug/L		0.5	23-FEB-20



Quality Control Report

Workorder: L2418792

Report Date: 27-FEB-20

Page 16 of 18

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5001548							
WG3279480-2 MB								
Tetrachloroethylene			<0.50		ug/L		0.5	23-FEB-20
Toluene			<0.50		ug/L		0.5	23-FEB-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	23-FEB-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	23-FEB-20
Trichloroethylene			<0.50		ug/L		0.5	23-FEB-20
Trichlorofluoromethane			<1.0		ug/L		1	23-FEB-20
Vinyl chloride			<0.50		ug/L		0.5	23-FEB-20
Surrogate: 1,4-Difluorobenzene			99.8		%		70-130	23-FEB-20
Surrogate: 4-Bromofluorobenzene			95.1		%		70-130	23-FEB-20
WG3279480-5 MS		WG3279480-3						
1,1,1,2-Tetrachloroethane			96.7		%		50-150	23-FEB-20
1,1,1,2,2-Tetrachloroethane			85.8		%		50-150	23-FEB-20
1,1,1-Trichloroethane			104.6		%		50-150	23-FEB-20
1,1,1,2-Trichloroethane			90.3		%		50-150	23-FEB-20
1,2-Dibromoethane			87.6		%		50-150	23-FEB-20
1,1-Dichloroethane			105.9		%		50-150	23-FEB-20
1,1-Dichloroethylene			102.4		%		50-150	23-FEB-20
1,2-Dichlorobenzene			100.2		%		50-150	23-FEB-20
1,2-Dichloroethane			95.3		%		50-150	23-FEB-20
1,2-Dichloropropane			103.1		%		50-150	23-FEB-20
1,3-Dichlorobenzene			103.0		%		50-150	23-FEB-20
1,4-Dichlorobenzene			102.3		%		50-150	23-FEB-20
Acetone			105.9		%		50-150	23-FEB-20
Benzene			103.9		%		50-150	23-FEB-20
Bromodichloromethane			101.1		%		50-150	23-FEB-20
Bromoform			83.7		%		50-150	23-FEB-20
Bromomethane			84.8		%		50-150	23-FEB-20
Carbon tetrachloride			109.3		%		50-150	23-FEB-20
Chlorobenzene			99.8		%		50-150	23-FEB-20
Chloroethane			111.2		%		50-150	23-FEB-20
Chloroform			102.9		%		50-150	23-FEB-20
cis-1,2-Dichloroethylene			96.6		%		50-150	23-FEB-20
cis-1,3-Dichloropropene			84.4		%		50-150	23-FEB-20
Dibromochloromethane			88.9		%		50-150	23-FEB-20



Quality Control Report

Workorder: L2418792

Report Date: 27-FEB-20

Page 17 of 18

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	Water							
Batch	R5001548							
WG3279480-5 MS		WG3279480-3						
Dichlorodifluoromethane			101.4		%		50-150	23-FEB-20
Dichloromethane			100.6		%		50-150	23-FEB-20
Ethylbenzene			105.1		%		50-150	23-FEB-20
m+p-Xylenes			105.7		%		50-150	23-FEB-20
Methyl Ethyl Ketone			89.1		%		50-150	23-FEB-20
Methyl Isobutyl Ketone			87.4		%		50-150	23-FEB-20
n-Hexane			100.1		%		50-150	23-FEB-20
MTBE			100.8		%		50-150	23-FEB-20
o-Xylene			112.5		%		50-150	23-FEB-20
Styrene			93.3		%		50-150	23-FEB-20
Tetrachloroethylene			101.2		%		50-150	23-FEB-20
Toluene			105.3		%		50-150	23-FEB-20
trans-1,2-Dichloroethylene			102.9		%		50-150	23-FEB-20
trans-1,3-Dichloropropene			88.4		%		50-150	23-FEB-20
Trichloroethylene			100.4		%		50-150	23-FEB-20
Trichlorofluoromethane			104.7		%		50-150	23-FEB-20
Vinyl chloride			119.4		%		50-150	23-FEB-20

Quality Control Report

Workorder: L2418792

Report Date: 27-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 18 of 18

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
J	Duplicate results and limits are expressed in terms of absolute difference.
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.



ALS Environmental

www.alsglobal.com

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2418792-COFC

COC Number: 14 -

Page 1 of 1

Report To		Acct#13791		Report Format / Distribution				Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)													
Company: GHD LIMITED				Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)				R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)													
Contact: Laura Ermeta				Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT													
Address: 455 Phillip St N2L 3X2				<input type="checkbox"/> Criteria on Report - provide details below if box checked				E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT													
Phone: 519-884-0510				Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge													
				Email 1 or Fax laura.ermeta@ghd.com				Specify Date Required for E2,E or P:													
				Email 2 See PO				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 type="checkbox"/> No				Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> FAX																	
Company: GHD LIMITED				Email 1 or Fax laura.ermeta@ghd.com																	
Contact: Laura Ermeta				Email 2																	
Project Information				Oil and Gas Required Fields (client use)																	
ALS Quote #:				Approver ID:				Cost Center:													
Job #: 44985-20-19				GL Account:				Routing Code:													
PO / AFE: 73506479				Activity Code:																	
LSD:				Location:																	
ALS Lab Work Order # (lab use only) L2418792				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	ALK, Conductivity, pH, TDS, TSS, Phenols	Br, NO2, NO3, SO4, Cl, F (ANIONS-C-6-WT)	DOC (DOC-WT), COD, TKN, TP	Total CN (CN-TOT-WT)	Un-ionized NH3 (NH3,ETL-NH3-UNION-CL)	Total Metals (MET-T-COMSS-WT,WT-44985-Met)	Total Mercury (HG-T-CVAAA-WT)	Total Cr 6+ (CR-CR6-I-WT), Hardness calc	VOCs (VOC-ROU-HS-WT,WT-44985-VOC)	SVOCs (SVOC-44985-P-WT)	CLIENT SUPPLIED TEMPERATURE **	CLIENT SUPPLIED pH **	Number of Containers		
	EQ Pond Discharge			17/02/20	10:00	Water	R	R	R	R	R	R	R	R	R	R	2.5	7.36			
	West Storm Water Pond			17/02/20	09:45	Water	R	R	R	R	R	R	R	R	R	R	2.5	7.60			
	East Storm Water Pond			17/02/20	09:30	Water	R	R	R	R	R	R	R	R	R	R	2.5	7.2			
Drinking Water (DW) Samples¹ (client use)				Special Instructions / Specify Criteria to add on report (client Use)																	
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				**Please fill in Client Supplied temperature and pH for Unionized NH3 calculation**																	
Are samples for human drinking water use? <input type="checkbox"/> Yes <input type="checkbox"/> No																					
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				SAMPLE CONDITION AS RECEIVED (lab use only)													
Released by: R. Tobin		Date: Feb 17/20	Time: 12:30	Received by:		Date:	Time:	Frozen <input type="checkbox"/>		SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		Ice packs Yes <input checked="" type="checkbox"/> No <input 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	
																		13.1			
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)													
Released by: R. Tobin		Date: Feb 17/20	Time: 12:30	Received by:		Date:	Time:	Received by: [Signature]		Date: Feb 20/20		Time: 9:30									

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 From 04 January 2014

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.

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: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 20-FEB-20
Report Date: 24-FEB-20 14:54 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2418880
Project P.O. #: 73506479
Job Reference: 44985-20-19
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: 9450 17 Avenue NW, Edmonton, AB T6N 1M9 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
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
L2418880-1 EQ POND DISCHARGE Sampled By: CLIENT on 17-FEB-20 @ 10:00 Matrix: WATER							
Microtox Physical Tests							
Turbidity	N/A				21-FEB-20	21-FEB-20	R4999708
Colour	Colourless				21-FEB-20	21-FEB-20	R4999708
Clarification	Centrifuged				21-FEB-20	21-FEB-20	R4999708
Initial pH	7.6		0.10	pH	21-FEB-20	21-FEB-20	R4999708
Final pH	7.6		0.10	pH	21-FEB-20	21-FEB-20	R4999708
Lab Treatment	None				21-FEB-20	21-FEB-20	R4999708
Microtox Original							
EC50 (15min) Original	>100		1.0	%	21-FEB-20	21-FEB-20	R4999708
EC20 (15min) Original	>100		1.0	%	21-FEB-20	21-FEB-20	R4999708
EC50 (5min) Original	>100		1.0	%	21-FEB-20	21-FEB-20	R4999708
EC20 (5min) Original	>100		1.0	%	21-FEB-20	21-FEB-20	R4999708
Interpretation Original	NON TOXIC				21-FEB-20	21-FEB-20	R4999708

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MICROTOX-ORG-ED	Water	Microtox Original	ERCB Directive 050
<p>Light output of luminescent bacteria is measured after they have been challenged by a sample of unknown toxicity, and compared to the light output of a control reagent blank. The difference in light output is attributed to the effect of the sample on the organisms, and the degree of light loss indicates metabolic inhibition and the degree of toxicity of the sample to the bacteria. EC50(5) and EC50(15) values are reported, and refer to the effective concentration of the sample that caused a 50% decrease in the light output in 5 and 15 minutes.</p>			
MICROTOX-PHYSICAL-ED	Water	Microtox Physical Tests	ERCB Directive 050

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, 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.



Environmental

Quality Control Report

Workorder: L2418880

Report Date: 24-FEB-20

Page 1 of 3

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MICROTOX-ORG-ED								
	Water							
Batch	R4999708							
WG3279264-2 CRM		PHENOL_ED						
EC50 (5min) Original			18.3		mg/L		13-26	21-FEB-20
WG3279264-3 CRM		PHENOL_ED						
EC50 (5min) Original			17.0		mg/L		13-26	21-FEB-20
WG3279264-4 DUP		L2418880-1						
EC50 (15min) Original		>100	>100	RPD-NA	%	N/A		21-FEB-20
EC20 (15min) Original		>100	>100	RPD-NA	%	N/A		21-FEB-20
EC50 (5min) Original		>100	>100	RPD-NA	%	N/A		21-FEB-20
EC20 (5min) Original		>100	>100	RPD-NA	%	N/A		21-FEB-20
WG3279264-1 MB								
EC50 (15min) Original			PASS					21-FEB-20
EC20 (15min) Original			PASS					21-FEB-20
EC50 (5min) Original			PASS					21-FEB-20
EC20 (5min) Original			PASS					21-FEB-20

Quality Control Report

Workorder: L2418880

Report Date: 24-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 2 of 3

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

Quality Control Report

Workorder: L2418880

Report Date: 24-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 3 of 3

Hold Time Exceedances:

ALS Product Description	Sample ID	Sampling Date	Date Processed	Rec. HT	Actual HT	Units	Qualifier
Microtox							
Microtox Original	1	17-FEB-20 10:00	21-FEB-20 00:00	3	4	days	EHTL

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2418880 were received on 20-FEB-20 09:23.

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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 25-FEB-20
Report Date: 26-FEB-20 14:12 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2420428
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2420428-1 EQ POND							
Sampled By: CLIENT on 24-FEB-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		26-FEB-20	R5006654
Benzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Bromodichloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Bromoform	<1.0		1.0	ug/L		26-FEB-20	R5006654
Bromomethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Carbon Disulfide	<1.0		1.0	ug/L		26-FEB-20	R5006654
Carbon tetrachloride	<0.20		0.20	ug/L		26-FEB-20	R5006654
Chlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dibromochloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloroethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloroform	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
1,2-Dibromoethane	<0.20		0.20	ug/L		26-FEB-20	R5006654
1,2-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,3-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,4-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dichlorodifluoromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
1,1-Dichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,2-Dichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dichloromethane	<2.0		2.0	ug/L		26-FEB-20	R5006654
1,2-Dichloropropane	<0.50		0.50	ug/L		26-FEB-20	R5006654
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		26-FEB-20	R5006654
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		26-FEB-20	R5006654
Ethylbenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
n-Hexane	<0.50		0.50	ug/L		26-FEB-20	R5006654
2-Hexanone	<20		20	ug/L		26-FEB-20	R5006654
Methyl Ethyl Ketone	<20		20	ug/L		26-FEB-20	R5006654
Methyl Isobutyl Ketone	<20		20	ug/L		26-FEB-20	R5006654
MTBE	<0.50		0.50	ug/L		26-FEB-20	R5006654
Styrene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Tetrachloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Toluene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,1-Trichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,2-Trichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Trichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Trichlorofluoromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654

* 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
L2420428-1 EQ POND Sampled By: CLIENT on 24-FEB-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		26-FEB-20	R5006654
o-Xylene	<0.30		0.30	ug/L		26-FEB-20	R5006654
m+p-Xylenes	<0.40		0.40	ug/L		26-FEB-20	R5006654
Xylenes (Total)	<0.50		0.50	ug/L		26-FEB-20	
Surrogate: 4-Bromofluorobenzene	98.9		70-130	%		26-FEB-20	R5006654
Surrogate: 1,4-Difluorobenzene	100.0		70-130	%		26-FEB-20	R5006654
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-FEB-20	
L2420428-2 WEST RETENTION POND Sampled By: CLIENT on 24-FEB-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		26-FEB-20	R5006654
Benzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Bromodichloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Bromoform	<1.0		1.0	ug/L		26-FEB-20	R5006654
Bromomethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Carbon Disulfide	<1.0		1.0	ug/L		26-FEB-20	R5006654
Carbon tetrachloride	<0.20		0.20	ug/L		26-FEB-20	R5006654
Chlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dibromochloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloroethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloroform	<1.0		1.0	ug/L		26-FEB-20	R5006654
Chloromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
1,2-Dibromoethane	<0.20		0.20	ug/L		26-FEB-20	R5006654
1,2-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,3-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,4-Dichlorobenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dichlorodifluoromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
1,1-Dichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,2-Dichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Dichloromethane	<2.0		2.0	ug/L		26-FEB-20	R5006654
1,2-Dichloropropane	<0.50		0.50	ug/L		26-FEB-20	R5006654
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		26-FEB-20	R5006654
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		26-FEB-20	R5006654
Ethylbenzene	<0.50		0.50	ug/L		26-FEB-20	R5006654
n-Hexane	<0.50		0.50	ug/L		26-FEB-20	R5006654
2-Hexanone	<20		20	ug/L		26-FEB-20	R5006654
Methyl Ethyl Ketone	<20		20	ug/L		26-FEB-20	R5006654

* 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
L2420428-2 WEST RETENTION POND							
Sampled By: CLIENT on 24-FEB-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		26-FEB-20	R5006654
MTBE	<0.50		0.50	ug/L		26-FEB-20	R5006654
Styrene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Tetrachloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Toluene	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,1-Trichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
1,1,2-Trichloroethane	<0.50		0.50	ug/L		26-FEB-20	R5006654
Trichloroethylene	<0.50		0.50	ug/L		26-FEB-20	R5006654
Trichlorofluoromethane	<1.0		1.0	ug/L		26-FEB-20	R5006654
Vinyl chloride	<0.50		0.50	ug/L		26-FEB-20	R5006654
o-Xylene	<0.30		0.30	ug/L		26-FEB-20	R5006654
m+p-Xylenes	<0.40		0.40	ug/L		26-FEB-20	R5006654
Xylenes (Total)	<0.50		0.50	ug/L		26-FEB-20	
Surrogate: 4-Bromofluorobenzene	98.8		70-130	%		26-FEB-20	R5006654
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		26-FEB-20	R5006654
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		26-FEB-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2420428

Report Date: 26-FEB-20

Page 1 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5006654							
WG3281037-4	DUP	WG3281037-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	26-FEB-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	26-FEB-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	26-FEB-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	26-FEB-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	26-FEB-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
m+p-Xylenes		<1.0	<0.40	RPD-NA	ug/L	N/A	30	26-FEB-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	26-FEB-20
Methyl Isobutyl Ketone		<20	<20		ug/L			26-FEB-20



Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

Page 2 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5006654							
WG3281037-4	DUP	WG3281037-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	26-FEB-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
o-Xylene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	26-FEB-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
trans-1,3-Dichloropropene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	26-FEB-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	26-FEB-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	26-FEB-20
WG3281037-1	LCS							
1,1,1,2-Tetrachloroethane			92.4		%		70-130	25-FEB-20
1,1,1,2,2-Tetrachloroethane			92.6		%		70-130	25-FEB-20
1,1,1-Trichloroethane			92.3		%		70-130	25-FEB-20
1,1,2-Trichloroethane			89.1		%		70-130	25-FEB-20
1,2-Dibromoethane			92.6		%		70-130	25-FEB-20
1,1-Dichloroethane			92.9		%		70-130	25-FEB-20
1,1-Dichloroethylene			88.8		%		70-130	25-FEB-20
1,2-Dichlorobenzene			95.2		%		70-130	25-FEB-20
1,2-Dichloroethane			94.7		%		70-130	25-FEB-20
1,2-Dichloropropane			94.0		%		70-130	25-FEB-20
1,3-Dichlorobenzene			97.3		%		70-130	25-FEB-20
1,4-Dichlorobenzene			97.6		%		70-130	25-FEB-20
2-Hexanone			97.4		%		60-140	25-FEB-20
Acetone			109.1		%		60-140	25-FEB-20
Benzene			90.4		%		70-130	25-FEB-20
Bromodichloromethane			96.2		%		70-130	25-FEB-20
Bromoform			90.6		%		70-130	25-FEB-20
Bromomethane			84.8		%		60-140	25-FEB-20
Carbon Disulfide			92.4		%		70-130	25-FEB-20
Carbon tetrachloride			93.2		%		70-130	25-FEB-20



Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

Page 3 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5006654							
WG3281037-1	LCS							
Chlorobenzene			90.1		%		70-130	25-FEB-20
Chloroethane			105.0		%		70-130	25-FEB-20
Chloroform			94.6		%		70-130	25-FEB-20
Chloromethane			114.0		%		60-140	25-FEB-20
cis-1,2-Dichloroethylene			92.1		%		70-130	25-FEB-20
cis-1,3-Dichloropropene			92.0		%		70-130	25-FEB-20
Dibromochloromethane			86.6		%		70-130	25-FEB-20
Dichlorodifluoromethane			111.4		%		50-140	25-FEB-20
Dichloromethane			96.9		%		70-130	25-FEB-20
Ethylbenzene			90.7		%		70-130	25-FEB-20
m+p-Xylenes			92.5		%		70-130	25-FEB-20
Methyl Ethyl Ketone			93.5		%		60-140	25-FEB-20
Methyl Isobutyl Ketone			98.4		%		50-150	25-FEB-20
n-Hexane			87.4		%		70-130	25-FEB-20
MTBE			93.9		%		70-130	25-FEB-20
o-Xylene			97.9		%		70-130	25-FEB-20
Styrene			90.5		%		70-130	25-FEB-20
Tetrachloroethylene			91.0		%		70-130	25-FEB-20
Toluene			93.3		%		70-130	25-FEB-20
trans-1,2-Dichloroethylene			91.3		%		70-130	25-FEB-20
trans-1,3-Dichloropropene			93.2		%		70-130	25-FEB-20
Trichloroethylene			90.7		%		70-130	25-FEB-20
Trichlorofluoromethane			92.7		%		60-140	25-FEB-20
Vinyl chloride			114.9		%		60-140	25-FEB-20
WG3281037-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	26-FEB-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	26-FEB-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	26-FEB-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	26-FEB-20
1,2-Dibromoethane			<0.20		ug/L		0.2	26-FEB-20
1,1-Dichloroethane			<0.50		ug/L		0.5	26-FEB-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	26-FEB-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	26-FEB-20
1,2-Dichloroethane			<0.50		ug/L		0.5	26-FEB-20



Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5006654							
WG3281037-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	26-FEB-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	26-FEB-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	26-FEB-20
2-Hexanone			<20		ug/L		20	26-FEB-20
Acetone			<20		ug/L		20	26-FEB-20
Benzene			<0.50		ug/L		0.5	26-FEB-20
Bromodichloromethane			<1.0		ug/L		1	26-FEB-20
Bromoform			<1.0		ug/L		1	26-FEB-20
Bromomethane			<0.50		ug/L		0.5	26-FEB-20
Carbon Disulfide			<1.0		ug/L		1	26-FEB-20
Carbon tetrachloride			<0.20		ug/L		0.2	26-FEB-20
Chlorobenzene			<0.50		ug/L		0.5	26-FEB-20
Chloroethane			<1.0		ug/L		1	26-FEB-20
Chloroform			<1.0		ug/L		1	26-FEB-20
Chloromethane			<1.0		ug/L		1	26-FEB-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	26-FEB-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	26-FEB-20
Dibromochloromethane			<1.0		ug/L		1	26-FEB-20
Dichlorodifluoromethane			<1.0		ug/L		1	26-FEB-20
Dichloromethane			<2.0		ug/L		2	26-FEB-20
Ethylbenzene			<0.50		ug/L		0.5	26-FEB-20
m+p-Xylenes			<0.40		ug/L		0.4	26-FEB-20
Methyl Ethyl Ketone			<20		ug/L		20	26-FEB-20
Methyl Isobutyl Ketone			<20		ug/L		20	26-FEB-20
n-Hexane			<0.50		ug/L		0.5	26-FEB-20
MTBE			<0.50		ug/L		0.5	26-FEB-20
o-Xylene			<0.30		ug/L		0.3	26-FEB-20
Styrene			<0.50		ug/L		0.5	26-FEB-20
Tetrachloroethylene			<0.50		ug/L		0.5	26-FEB-20
Toluene			<0.50		ug/L		0.5	26-FEB-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	26-FEB-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	26-FEB-20
Trichloroethylene			<0.50		ug/L		0.5	26-FEB-20



Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5006654							
WG3281037-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	26-FEB-20
Vinyl chloride			<0.50		ug/L		0.5	26-FEB-20
Surrogate: 1,4-Difluorobenzene			100.0		%		70-130	26-FEB-20
Surrogate: 4-Bromofluorobenzene			99.6		%		70-130	26-FEB-20
WG3281037-5 MS		WG3281037-3						
1,1,1,2-Tetrachloroethane			92.7		%		50-150	26-FEB-20
1,1,2,2-Tetrachloroethane			89.8		%		50-150	26-FEB-20
1,1,1-Trichloroethane			93.6		%		50-150	26-FEB-20
1,1,2-Trichloroethane			87.3		%		50-150	26-FEB-20
1,2-Dibromoethane			89.4		%		50-150	26-FEB-20
1,1-Dichloroethane			92.3		%		50-150	26-FEB-20
1,1-Dichloroethylene			88.4		%		50-150	26-FEB-20
1,2-Dichlorobenzene			95.0		%		50-150	26-FEB-20
1,2-Dichloroethane			91.5		%		50-150	26-FEB-20
1,2-Dichloropropane			92.1		%		50-150	26-FEB-20
1,3-Dichlorobenzene			98.5		%		50-150	26-FEB-20
1,4-Dichlorobenzene			98.1		%		50-150	26-FEB-20
2-Hexanone			91.1		%		50-150	26-FEB-20
Acetone			106.8		%		50-150	26-FEB-20
Benzene			89.8		%		50-150	26-FEB-20
Bromodichloromethane			94.4		%		50-150	26-FEB-20
Bromoform			87.8		%		50-150	26-FEB-20
Bromomethane			81.0		%		50-150	26-FEB-20
Carbon Disulfide			89.8		%		50-150	26-FEB-20
Carbon tetrachloride			94.7		%		50-150	26-FEB-20
Chlorobenzene			90.1		%		50-150	26-FEB-20
Chloroethane			102.9		%		50-150	26-FEB-20
Chloroform			94.6		%		50-150	26-FEB-20
Chloromethane			107.8		%		50-150	26-FEB-20
cis-1,2-Dichloroethylene			91.4		%		50-150	26-FEB-20
cis-1,3-Dichloropropene			85.2		%		50-150	26-FEB-20
Dibromochloromethane			84.6		%		50-150	26-FEB-20
Dichlorodifluoromethane			102.0		%		50-150	26-FEB-20
Dichloromethane			95.6		%		50-150	26-FEB-20



Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5006654							
WG3281037-5	MS	WG3281037-3						
Ethylbenzene			93.1		%		50-150	26-FEB-20
m+p-Xylenes			94.6		%		50-150	26-FEB-20
Methyl Ethyl Ketone			88.2		%		50-150	26-FEB-20
Methyl Isobutyl Ketone			90.1		%		50-150	26-FEB-20
n-Hexane			86.7		%		50-150	26-FEB-20
MTBE			94.1		%		50-150	26-FEB-20
o-Xylene			99.5		%		50-150	26-FEB-20
Styrene			89.2		%		50-150	26-FEB-20
Tetrachloroethylene			93.3		%		50-150	26-FEB-20
Toluene			95.1		%		50-150	26-FEB-20
trans-1,2-Dichloroethylene			90.2		%		50-150	26-FEB-20
trans-1,3-Dichloropropene			90.5		%		50-150	26-FEB-20
Trichloroethylene			91.0		%		50-150	26-FEB-20
Trichlorofluoromethane			92.0		%		50-150	26-FEB-20
Vinyl chloride			110.3		%		50-150	26-FEB-20

Quality Control Report

Workorder: L2420428

Report Date: 26-FEB-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2420428-COFC

COC Number: 17 -

Page 1 of 1

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Report To		Report Format						
Contact and company name below will appear on the final report		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)						
Company:	GHD LIMITED - ACCT #13791	Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO						
Contact:	Laura Ermeta	<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked						
Phone:	519-884-0510	Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX						
Company address below will appear on the final report		Email 1 or Fax laura.ermeta@ghd.com						
Street:	455 Phillip St	Email 2 See PO						
City/Province:	Waterloo, Ontario	Email 3						
Postal Code:	N2L 3X2	Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX						
Invoice To	Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	Email 1 or Fax laura.ermeta@ghd.com						
Copy of Invoice with Report <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		Email 2						
Company:	GHD Limited	Project Information						
Contact:	Laura Ermeta	ALS Account # / Quote #: 13791						
Oil and Gas Required Fields (client use)		Job #: 44985-30-10						
AFE/Cost Center:		PO / AFE: 73512223-1						
Major/Minor Code:		LSD:						
Routing Code:		ALS Lab Work Order # (lab use only): <u>L2420428 A</u>						
Requisitioner:		ALS Contact: Rick H						
Location:		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	NUMBER OF CONTAINERS	Analysis Request	SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)
	EQ Pond	Feb 24/20	1100	Water	2	<input checked="" type="checkbox"/>		
	West Retention Pond	Feb 24/20	1100	Water	2	<input checked="" type="checkbox"/>		
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
				Water				
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)						
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 checked="" type="checkbox"/> NO								
Released by: <u>[Signature]</u>		Date: <u>Feb 24/20</u>		Time: <u>11:30</u>		INITIAL SHIPMENT RECEPTION (lab use only)		

REFER TO BACK-PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 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.
 . If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.



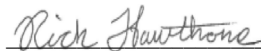
GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 04-MAR-20
Report Date: 06-MAR-20 08:28 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2423731
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
C of C Numbers:
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
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2423731-1 EQ POND							
Sampled By: CLIENT on 02-MAR-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		06-MAR-20	R5018096
Benzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Bromodichloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Bromoform	<1.0		1.0	ug/L		06-MAR-20	R5018096
Bromomethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Carbon Disulfide	<1.0		1.0	ug/L		06-MAR-20	R5018096
Carbon tetrachloride	<0.20		0.20	ug/L		06-MAR-20	R5018096
Chlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dibromochloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloroethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloroform	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
1,2-Dibromoethane	<0.20		0.20	ug/L		06-MAR-20	R5018096
1,2-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,3-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,4-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dichlorodifluoromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
1,1-Dichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,2-Dichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dichloromethane	<2.0		2.0	ug/L		06-MAR-20	R5018096
1,2-Dichloropropane	<0.50		0.50	ug/L		06-MAR-20	R5018096
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		06-MAR-20	R5018096
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		06-MAR-20	R5018096
Ethylbenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
n-Hexane	<0.50		0.50	ug/L		06-MAR-20	R5018096
2-Hexanone	<20		20	ug/L		06-MAR-20	R5018096
Methyl Ethyl Ketone	<20		20	ug/L		06-MAR-20	R5018096
Methyl Isobutyl Ketone	<20		20	ug/L		06-MAR-20	R5018096
MTBE	<0.50		0.50	ug/L		06-MAR-20	R5018096
Styrene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Tetrachloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Toluene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,1-Trichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,2-Trichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Trichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Trichlorofluoromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096

* 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
L2423731-1 EQ POND Sampled By: CLIENT on 02-MAR-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		06-MAR-20	R5018096
o-Xylene	<0.30		0.30	ug/L		06-MAR-20	R5018096
m+p-Xylenes	<0.40		0.40	ug/L		06-MAR-20	R5018096
Xylenes (Total)	<0.50		0.50	ug/L		06-MAR-20	
Surrogate: 4-Bromofluorobenzene	100.3		70-130	%		06-MAR-20	R5018096
Surrogate: 1,4-Difluorobenzene	101.8		70-130	%		06-MAR-20	R5018096
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		06-MAR-20	
L2423731-2 WEST RETENTION POND Sampled By: CLIENT on 02-MAR-20 @ 11:00 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		06-MAR-20	R5018096
Benzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Bromodichloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Bromoform	<1.0		1.0	ug/L		06-MAR-20	R5018096
Bromomethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Carbon Disulfide	<1.0		1.0	ug/L		06-MAR-20	R5018096
Carbon tetrachloride	<0.20		0.20	ug/L		06-MAR-20	R5018096
Chlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dibromochloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloroethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloroform	<1.0		1.0	ug/L		06-MAR-20	R5018096
Chloromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
1,2-Dibromoethane	<0.20		0.20	ug/L		06-MAR-20	R5018096
1,2-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,3-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,4-Dichlorobenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dichlorodifluoromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
1,1-Dichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,2-Dichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Dichloromethane	<2.0		2.0	ug/L		06-MAR-20	R5018096
1,2-Dichloropropane	<0.50		0.50	ug/L		06-MAR-20	R5018096
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		06-MAR-20	R5018096
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		06-MAR-20	R5018096
Ethylbenzene	<0.50		0.50	ug/L		06-MAR-20	R5018096
n-Hexane	<0.50		0.50	ug/L		06-MAR-20	R5018096
2-Hexanone	<20		20	ug/L		06-MAR-20	R5018096
Methyl Ethyl Ketone	<20		20	ug/L		06-MAR-20	R5018096

* 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
L2423731-2 WEST RETENTION POND							
Sampled By: CLIENT on 02-MAR-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		06-MAR-20	R5018096
MTBE	<0.50		0.50	ug/L		06-MAR-20	R5018096
Styrene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Tetrachloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Toluene	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,1-Trichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
1,1,2-Trichloroethane	<0.50		0.50	ug/L		06-MAR-20	R5018096
Trichloroethylene	<0.50		0.50	ug/L		06-MAR-20	R5018096
Trichlorofluoromethane	<1.0		1.0	ug/L		06-MAR-20	R5018096
Vinyl chloride	<0.50		0.50	ug/L		06-MAR-20	R5018096
o-Xylene	<0.30		0.30	ug/L		06-MAR-20	R5018096
m+p-Xylenes	<0.40		0.40	ug/L		06-MAR-20	R5018096
Xylenes (Total)	<0.50		0.50	ug/L		06-MAR-20	
Surrogate: 4-Bromofluorobenzene	100.5		70-130	%		06-MAR-20	R5018096
Surrogate: 1,4-Difluorobenzene	101.9		70-130	%		06-MAR-20	R5018096
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		06-MAR-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5018096							
WG3280592-4	DUP	WG3280592-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,1,1-Trichloroethane		2.94	2.84		ug/L	3.5	30	06-MAR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	06-MAR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	06-MAR-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	06-MAR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	06-MAR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-MAR-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	06-MAR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	06-MAR-20
Methyl Isobutyl Ketone		<20	<20		ug/L			06-MAR-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5018096							
WG3280592-4	DUP	WG3280592-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	06-MAR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-MAR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	06-MAR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	06-MAR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	06-MAR-20
WG3280592-1	LCS							
1,1,1,2-Tetrachloroethane			98.3		%		70-130	06-MAR-20
1,1,1,2,2-Tetrachloroethane			93.1		%		70-130	06-MAR-20
1,1,1-Trichloroethane			99.5		%		70-130	06-MAR-20
1,1,2-Trichloroethane			100.6		%		70-130	06-MAR-20
1,2-Dibromoethane			101.4		%		70-130	06-MAR-20
1,1-Dichloroethane			109.0		%		70-130	06-MAR-20
1,1-Dichloroethylene			98.9		%		70-130	06-MAR-20
1,2-Dichlorobenzene			101.2		%		70-130	06-MAR-20
1,2-Dichloroethane			100.2		%		70-130	06-MAR-20
1,2-Dichloropropane			100.4		%		70-130	06-MAR-20
1,3-Dichlorobenzene			102.4		%		70-130	06-MAR-20
1,4-Dichlorobenzene			103.7		%		70-130	06-MAR-20
2-Hexanone			101.1		%		60-140	06-MAR-20
Acetone			114.8		%		60-140	06-MAR-20
Benzene			101.4		%		70-130	06-MAR-20
Bromodichloromethane			98.0		%		70-130	06-MAR-20
Bromoform			97.0		%		70-130	06-MAR-20
Bromomethane			90.9		%		60-140	06-MAR-20
Carbon Disulfide			103.2		%		70-130	06-MAR-20
Carbon tetrachloride			101.1		%		70-130	06-MAR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5018096							
WG3280592-1	LCS							
Chlorobenzene			102.4		%		70-130	06-MAR-20
Chloroethane			113.2		%		70-130	06-MAR-20
Chloroform			102.2		%		70-130	06-MAR-20
Chloromethane			118.3		%		60-140	06-MAR-20
cis-1,2-Dichloroethylene			108.3		%		70-130	06-MAR-20
cis-1,3-Dichloropropene			96.5		%		70-130	06-MAR-20
Dibromochloromethane			98.1		%		70-130	06-MAR-20
Dichlorodifluoromethane			112.0		%		50-140	06-MAR-20
Dichloromethane			104.6		%		70-130	06-MAR-20
Ethylbenzene			101.1		%		70-130	06-MAR-20
m+p-Xylenes			101.5		%		70-130	06-MAR-20
Methyl Ethyl Ketone			103.4		%		60-140	06-MAR-20
Methyl Isobutyl Ketone			96.2		%		50-150	06-MAR-20
n-Hexane			98.8		%		70-130	06-MAR-20
MTBE			101.2		%		70-130	06-MAR-20
o-Xylene			108.5		%		70-130	06-MAR-20
Styrene			95.7		%		70-130	06-MAR-20
Tetrachloroethylene			103.9		%		70-130	06-MAR-20
Toluene			103.6		%		70-130	06-MAR-20
trans-1,2-Dichloroethylene			100.0		%		70-130	06-MAR-20
trans-1,3-Dichloropropene			102.6		%		70-130	06-MAR-20
Trichloroethylene			100.8		%		70-130	06-MAR-20
Trichlorofluoromethane			101.8		%		60-140	06-MAR-20
Vinyl chloride			117.7		%		60-140	06-MAR-20
WG3280592-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	06-MAR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	06-MAR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	06-MAR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	06-MAR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	06-MAR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	06-MAR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	06-MAR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	06-MAR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	06-MAR-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5018096							
WG3280592-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	06-MAR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	06-MAR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	06-MAR-20
2-Hexanone			<20		ug/L		20	06-MAR-20
Acetone			<20		ug/L		20	06-MAR-20
Benzene			<0.50		ug/L		0.5	06-MAR-20
Bromodichloromethane			<1.0		ug/L		1	06-MAR-20
Bromoform			<1.0		ug/L		1	06-MAR-20
Bromomethane			<0.50		ug/L		0.5	06-MAR-20
Carbon Disulfide			<1.0		ug/L		1	06-MAR-20
Carbon tetrachloride			<0.20		ug/L		0.2	06-MAR-20
Chlorobenzene			<0.50		ug/L		0.5	06-MAR-20
Chloroethane			<1.0		ug/L		1	06-MAR-20
Chloroform			<1.0		ug/L		1	06-MAR-20
Chloromethane			<1.0		ug/L		1	06-MAR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	06-MAR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	06-MAR-20
Dibromochloromethane			<1.0		ug/L		1	06-MAR-20
Dichlorodifluoromethane			<1.0		ug/L		1	06-MAR-20
Dichloromethane			<2.0		ug/L		2	06-MAR-20
Ethylbenzene			<0.50		ug/L		0.5	06-MAR-20
m+p-Xylenes			<0.40		ug/L		0.4	06-MAR-20
Methyl Ethyl Ketone			<20		ug/L		20	06-MAR-20
Methyl Isobutyl Ketone			<20		ug/L		20	06-MAR-20
n-Hexane			<0.50		ug/L		0.5	06-MAR-20
MTBE			<0.50		ug/L		0.5	06-MAR-20
o-Xylene			<0.30		ug/L		0.3	06-MAR-20
Styrene			<0.50		ug/L		0.5	06-MAR-20
Tetrachloroethylene			<0.50		ug/L		0.5	06-MAR-20
Toluene			<0.50		ug/L		0.5	06-MAR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	06-MAR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	06-MAR-20
Trichloroethylene			<0.50		ug/L		0.5	06-MAR-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5018096							
WG3280592-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	06-MAR-20
Vinyl chloride			<0.50		ug/L		0.5	06-MAR-20
Surrogate: 1,4-Difluorobenzene			100.7		%		70-130	06-MAR-20
Surrogate: 4-Bromofluorobenzene			99.4		%		70-130	06-MAR-20
WG3280592-5 MS		WG3280592-3						
1,1,1,2-Tetrachloroethane			98.2		%		50-150	06-MAR-20
1,1,2,2-Tetrachloroethane			98.7		%		50-150	06-MAR-20
1,1,1-Trichloroethane			98.1		%		50-150	06-MAR-20
1,1,2-Trichloroethane			103.1		%		50-150	06-MAR-20
1,2-Dibromoethane			104.2		%		50-150	06-MAR-20
1,1-Dichloroethane			99.0		%		50-150	06-MAR-20
1,1-Dichloroethylene			95.7		%		50-150	06-MAR-20
1,2-Dichlorobenzene			101.0		%		50-150	06-MAR-20
1,2-Dichloroethane			103.1		%		50-150	06-MAR-20
1,2-Dichloropropane			101.1		%		50-150	06-MAR-20
1,3-Dichlorobenzene			101.1		%		50-150	06-MAR-20
1,4-Dichlorobenzene			102.5		%		50-150	06-MAR-20
2-Hexanone			108.1		%		50-150	06-MAR-20
Acetone			113.9		%		50-150	06-MAR-20
Benzene			101.1		%		50-150	06-MAR-20
Bromodichloromethane			99.6		%		50-150	06-MAR-20
Bromoform			100.7		%		50-150	06-MAR-20
Bromomethane			89.5		%		50-150	06-MAR-20
Carbon Disulfide			100.9		%		50-150	06-MAR-20
Carbon tetrachloride			99.1		%		50-150	06-MAR-20
Chlorobenzene			101.9		%		50-150	06-MAR-20
Chloroethane			111.7		%		50-150	06-MAR-20
Chloroform			102.6		%		50-150	06-MAR-20
Chloromethane			119.1		%		50-150	06-MAR-20
cis-1,2-Dichloroethylene			96.5		%		50-150	06-MAR-20
cis-1,3-Dichloropropene			97.3		%		50-150	06-MAR-20
Dibromochloromethane			99.3		%		50-150	06-MAR-20
Dichlorodifluoromethane			117.4		%		50-150	06-MAR-20
Dichloromethane			103.1		%		50-150	06-MAR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5018096							
WG3280592-5 MS		WG3280592-3						
Ethylbenzene			98.7		%		50-150	06-MAR-20
m+p-Xylenes			99.6		%		50-150	06-MAR-20
Methyl Ethyl Ketone			110.1		%		50-150	06-MAR-20
Methyl Isobutyl Ketone			103.0		%		50-150	06-MAR-20
n-Hexane			93.6		%		50-150	06-MAR-20
MTBE			100.4		%		50-150	06-MAR-20
o-Xylene			107.5		%		50-150	06-MAR-20
Styrene			96.2		%		50-150	06-MAR-20
Tetrachloroethylene			100.5		%		50-150	06-MAR-20
Toluene			100.7		%		50-150	06-MAR-20
trans-1,2-Dichloroethylene			97.9		%		50-150	06-MAR-20
trans-1,3-Dichloropropene			102.4		%		50-150	06-MAR-20
Trichloroethylene			99.3		%		50-150	06-MAR-20
Trichlorofluoromethane			98.9		%		50-150	06-MAR-20
Vinyl chloride			116.8		%		50-150	06-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.



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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)																																		
Company: GHD LIMITED - ACCT #13791		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: Laura Ermeta		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td rowspan="3" style="writing-mode: vertical-rl; transform: rotate(180deg);">PRIORITY (Business Days)</td> <td>4 day [P4-20%] <input type="checkbox"/></td> <td rowspan="3" style="writing-mode: vertical-rl; transform: rotate(180deg);">EMERGENCY</td> <td>1 Business day [E - 100%] <input type="checkbox"/></td> </tr> <tr> <td>3 day [P3-25%] <input type="checkbox"/></td> <td>Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/></td> </tr> <tr> <td>2 day [P2-50%] <input type="checkbox"/></td> <td>(Laboratory opening fees may apply)] <input type="checkbox"/></td> </tr> </table>				PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>	EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>	3 day [P3-25%] <input type="checkbox"/>	Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>	2 day [P2-50%] <input type="checkbox"/>	(Laboratory opening fees may apply)] <input type="checkbox"/>																							
PRIORITY (Business Days)	4 day [P4-20%] <input type="checkbox"/>	EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>																																				
	3 day [P3-25%] <input type="checkbox"/>		Same Day, Weekend or Statutory holiday [E2 -200%] <input type="checkbox"/>																																				
	2 day [P2-50%] <input type="checkbox"/>		(Laboratory opening fees may apply)] <input type="checkbox"/>																																				
Phone: 519-884-0510		<input type="checkbox"/> Compare Results to Criteria on Report - provide details below if box checked			Date and Time Required for all E&P TATs:																																		
Company address below will appear on the final report		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			For tests that can not be performed according to the service level selected, you will be contacted.																																		
Street: 455 Phillip St		Email 1 or Fax laura.ermeta@ghd.com			Analysis Request																																		
City/Province: Waterloo, Ontario		Email 2 See PO																																					
Postal Code: N2L 3X2		Email 3			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (FP) below																																		
Invoice To Same as Report To <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO		Invoice Distribution																																					
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			<table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">VOC-ROU-HS-WT</td> <td colspan="12"></td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">SAMPLES ON HOLD</td> <td style="writing-mode: vertical-rl; transform: rotate(180deg);">SUSPECTED HAZARD (see Special Instructions)</td> </tr> <tr><td colspan="15" style="height: 100px;"></td></tr> </table>				NUMBER OF CONTAINERS	VOC-ROU-HS-WT													SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)															
NUMBER OF CONTAINERS	VOC-ROU-HS-WT													SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																								
Company: GHD Limited		Email 1 or Fax laura.ermeta@ghd.com																																					
Contact: Laura Ermeta		Email 2																																					
Project Information		Oil and Gas Required Fields (client use)																																					
ALS Account # / Quote #: 13791		AFE/Cost Center: PO#																																					
Job #: 44985-30-10		Major/Minor Code: Routing Code:																																					
PO / AFE: 73512223-1		Requisitioner:																																					
LSD:		Location:																																					
ALS Lab Work Order # (lab use only): 12423731		ALS Contact: Rick H Sampler:																																					
Drinking Water (DW) Samples¹ (client use)		Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)																																					
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 checked="" type="checkbox"/> NO																																							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)																																					
Released by: <i>[Signature]</i> Date: Mar 2/20 Time: 1300		Received by: _____ Date: _____ Time: _____																																					



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 10-MAR-20
Report Date: 11-MAR-20 08:04 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2425943
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
L2425943-1 EAST STORM POND							
Sampled By: CLIENT on 09-MAR-20 @ 10:40							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		11-MAR-20	R5020890
Benzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Bromodichloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Bromoform	<1.0		1.0	ug/L		11-MAR-20	R5020890
Bromomethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Carbon Disulfide	<1.0		1.0	ug/L		11-MAR-20	R5020890
Carbon tetrachloride	<0.20		0.20	ug/L		11-MAR-20	R5020890
Chlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dibromochloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloroethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloroform	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
1,2-Dibromoethane	<0.20		0.20	ug/L		11-MAR-20	R5020890
1,2-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,3-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,4-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dichlorodifluoromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
1,1-Dichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,2-Dichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dichloromethane	<2.0		2.0	ug/L		11-MAR-20	R5020890
1,2-Dichloropropane	<0.50		0.50	ug/L		11-MAR-20	R5020890
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		11-MAR-20	R5020890
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		11-MAR-20	R5020890
Ethylbenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
n-Hexane	<0.50		0.50	ug/L		11-MAR-20	R5020890
2-Hexanone	<20		20	ug/L		11-MAR-20	R5020890
Methyl Ethyl Ketone	<20		20	ug/L		11-MAR-20	R5020890
Methyl Isobutyl Ketone	<20		20	ug/L		11-MAR-20	R5020890
MTBE	<0.50		0.50	ug/L		11-MAR-20	R5020890
Styrene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Tetrachloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Toluene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,1-Trichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,2-Trichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Trichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Trichlorofluoromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890

* 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
L2425943-1 EAST STORM POND Sampled By: CLIENT on 09-MAR-20 @ 10:40 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		11-MAR-20	R5020890
o-Xylene	<0.30		0.30	ug/L		11-MAR-20	R5020890
m+p-Xylenes	<0.40		0.40	ug/L		11-MAR-20	R5020890
Xylenes (Total)	<0.50		0.50	ug/L		11-MAR-20	
Surrogate: 4-Bromofluorobenzene	98.1		70-130	%		11-MAR-20	R5020890
Surrogate: 1,4-Difluorobenzene	99.4		70-130	%		11-MAR-20	R5020890
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		11-MAR-20	
L2425943-2 WEST STORM POND Sampled By: CLIENT on 09-MAR-20 @ 10:30 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		11-MAR-20	R5020890
Benzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Bromodichloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Bromoform	<1.0		1.0	ug/L		11-MAR-20	R5020890
Bromomethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Carbon Disulfide	<1.0		1.0	ug/L		11-MAR-20	R5020890
Carbon tetrachloride	<0.20		0.20	ug/L		11-MAR-20	R5020890
Chlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dibromochloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloroethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloroform	<1.0		1.0	ug/L		11-MAR-20	R5020890
Chloromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
1,2-Dibromoethane	<0.20		0.20	ug/L		11-MAR-20	R5020890
1,2-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,3-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,4-Dichlorobenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dichlorodifluoromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
1,1-Dichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,2-Dichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Dichloromethane	<2.0		2.0	ug/L		11-MAR-20	R5020890
1,2-Dichloropropane	<0.50		0.50	ug/L		11-MAR-20	R5020890
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		11-MAR-20	R5020890
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		11-MAR-20	R5020890
Ethylbenzene	<0.50		0.50	ug/L		11-MAR-20	R5020890
n-Hexane	<0.50		0.50	ug/L		11-MAR-20	R5020890
2-Hexanone	<20		20	ug/L		11-MAR-20	R5020890
Methyl Ethyl Ketone	<20		20	ug/L		11-MAR-20	R5020890

* 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
L2425943-2 WEST STORM POND							
Sampled By: CLIENT on 09-MAR-20 @ 10:30							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		11-MAR-20	R5020890
MTBE	<0.50		0.50	ug/L		11-MAR-20	R5020890
Styrene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Tetrachloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Toluene	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,1-Trichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
1,1,2-Trichloroethane	<0.50		0.50	ug/L		11-MAR-20	R5020890
Trichloroethylene	<0.50		0.50	ug/L		11-MAR-20	R5020890
Trichlorofluoromethane	<1.0		1.0	ug/L		11-MAR-20	R5020890
Vinyl chloride	<0.50		0.50	ug/L		11-MAR-20	R5020890
o-Xylene	<0.30		0.30	ug/L		11-MAR-20	R5020890
m+p-Xylenes	<0.40		0.40	ug/L		11-MAR-20	R5020890
Xylenes (Total)	<0.50		0.50	ug/L		11-MAR-20	
Surrogate: 4-Bromofluorobenzene	99.2		70-130	%		11-MAR-20	R5020890
Surrogate: 1,4-Difluorobenzene	100.5		70-130	%		11-MAR-20	R5020890
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		11-MAR-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2425943

Report Date: 11-MAR-20

Page 1 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5020890							
WG3289533-4	DUP	WG3289533-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	11-MAR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	11-MAR-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	11-MAR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	11-MAR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	11-MAR-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	11-MAR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	11-MAR-20
Methyl Isobutyl Ketone		<20	<20		ug/L			11-MAR-20



Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

Page 2 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5020890							
WG3289533-4	DUP	WG3289533-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	11-MAR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	11-MAR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	11-MAR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	11-MAR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	11-MAR-20
WG3289533-1	LCS							
1,1,1,2-Tetrachloroethane			92.4		%		70-130	10-MAR-20
1,1,1,2,2-Tetrachloroethane			95.7		%		70-130	10-MAR-20
1,1,1-Trichloroethane			90.1		%		70-130	10-MAR-20
1,1,2-Trichloroethane			95.4		%		70-130	10-MAR-20
1,2-Dibromoethane			96.9		%		70-130	10-MAR-20
1,1-Dichloroethane			90.6		%		70-130	10-MAR-20
1,1-Dichloroethylene			83.8		%		70-130	10-MAR-20
1,2-Dichlorobenzene			93.1		%		70-130	10-MAR-20
1,2-Dichloroethane			95.6		%		70-130	10-MAR-20
1,2-Dichloropropane			92.8		%		70-130	10-MAR-20
1,3-Dichlorobenzene			93.1		%		70-130	10-MAR-20
1,4-Dichlorobenzene			93.0		%		70-130	10-MAR-20
2-Hexanone			97.0		%		60-140	10-MAR-20
Acetone			103.4		%		60-140	10-MAR-20
Benzene			91.6		%		70-130	10-MAR-20
Bromodichloromethane			97.0		%		70-130	10-MAR-20
Bromoform			96.5		%		70-130	10-MAR-20
Bromomethane			78.7		%		60-140	10-MAR-20
Carbon Disulfide			86.3		%		70-130	10-MAR-20
Carbon tetrachloride			91.6		%		70-130	10-MAR-20



Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

Page 3 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5020890							
WG3289533-1	LCS							
Chlorobenzene			92.2		%		70-130	10-MAR-20
Chloroethane			98.7		%		70-130	10-MAR-20
Chloroform			94.1		%		70-130	10-MAR-20
Chloromethane			102.4		%		60-140	10-MAR-20
cis-1,2-Dichloroethylene			90.4		%		70-130	10-MAR-20
cis-1,3-Dichloropropene			91.9		%		70-130	10-MAR-20
Dibromochloromethane			94.3		%		70-130	10-MAR-20
Dichlorodifluoromethane			95.1		%		50-140	10-MAR-20
Dichloromethane			95.4		%		70-130	10-MAR-20
Ethylbenzene			87.8		%		70-130	10-MAR-20
m+p-Xylenes			88.7		%		70-130	10-MAR-20
Methyl Ethyl Ketone			89.2		%		60-140	10-MAR-20
Methyl Isobutyl Ketone			97.9		%		50-150	10-MAR-20
n-Hexane			80.8		%		70-130	10-MAR-20
MTBE			94.7		%		70-130	10-MAR-20
o-Xylene			97.0		%		70-130	10-MAR-20
Styrene			87.1		%		70-130	10-MAR-20
Tetrachloroethylene			87.7		%		70-130	10-MAR-20
Toluene			89.7		%		70-130	10-MAR-20
trans-1,2-Dichloroethylene			86.5		%		70-130	10-MAR-20
trans-1,3-Dichloropropene			90.9		%		70-130	10-MAR-20
Trichloroethylene			91.0		%		70-130	10-MAR-20
Trichlorofluoromethane			88.2		%		60-140	10-MAR-20
Vinyl chloride			104.3		%		60-140	10-MAR-20
WG3289533-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	11-MAR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	11-MAR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	11-MAR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	11-MAR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	11-MAR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	11-MAR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	11-MAR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	11-MAR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	11-MAR-20



Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

Page 4 of 7

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5020890							
WG3289533-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	11-MAR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	11-MAR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	11-MAR-20
2-Hexanone			<20		ug/L		20	11-MAR-20
Acetone			<20		ug/L		20	11-MAR-20
Benzene			<0.50		ug/L		0.5	11-MAR-20
Bromodichloromethane			<1.0		ug/L		1	11-MAR-20
Bromoform			<1.0		ug/L		1	11-MAR-20
Bromomethane			<0.50		ug/L		0.5	11-MAR-20
Carbon Disulfide			<1.0		ug/L		1	11-MAR-20
Carbon tetrachloride			<0.20		ug/L		0.2	11-MAR-20
Chlorobenzene			<0.50		ug/L		0.5	11-MAR-20
Chloroethane			<1.0		ug/L		1	11-MAR-20
Chloroform			<1.0		ug/L		1	11-MAR-20
Chloromethane			<1.0		ug/L		1	11-MAR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	11-MAR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	11-MAR-20
Dibromochloromethane			<1.0		ug/L		1	11-MAR-20
Dichlorodifluoromethane			<1.0		ug/L		1	11-MAR-20
Dichloromethane			<2.0		ug/L		2	11-MAR-20
Ethylbenzene			<0.50		ug/L		0.5	11-MAR-20
m+p-Xylenes			<0.40		ug/L		0.4	11-MAR-20
Methyl Ethyl Ketone			<20		ug/L		20	11-MAR-20
Methyl Isobutyl Ketone			<20		ug/L		20	11-MAR-20
n-Hexane			<0.50		ug/L		0.5	11-MAR-20
MTBE			<0.50		ug/L		0.5	11-MAR-20
o-Xylene			<0.30		ug/L		0.3	11-MAR-20
Styrene			<0.50		ug/L		0.5	11-MAR-20
Tetrachloroethylene			<0.50		ug/L		0.5	11-MAR-20
Toluene			<0.50		ug/L		0.5	11-MAR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	11-MAR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	11-MAR-20
Trichloroethylene			<0.50		ug/L		0.5	11-MAR-20



Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5020890							
WG3289533-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	11-MAR-20
Vinyl chloride			<0.50		ug/L		0.5	11-MAR-20
Surrogate: 1,4-Difluorobenzene			100.7		%		70-130	11-MAR-20
Surrogate: 4-Bromofluorobenzene			97.3		%		70-130	11-MAR-20
WG3289533-5 MS		WG3289533-3						
1,1,1,2-Tetrachloroethane			91.7		%		50-150	11-MAR-20
1,1,2,2-Tetrachloroethane			84.6		%		50-150	11-MAR-20
1,1,1-Trichloroethane			92.3		%		50-150	11-MAR-20
1,1,2-Trichloroethane			87.9		%		50-150	11-MAR-20
1,2-Dibromoethane			87.2		%		50-150	11-MAR-20
1,1-Dichloroethane			89.8		%		50-150	11-MAR-20
1,1-Dichloroethylene			85.5		%		50-150	11-MAR-20
1,2-Dichlorobenzene			93.0		%		50-150	11-MAR-20
1,2-Dichloroethane			86.2		%		50-150	11-MAR-20
1,2-Dichloropropane			88.3		%		50-150	11-MAR-20
1,3-Dichlorobenzene			95.5		%		50-150	11-MAR-20
1,4-Dichlorobenzene			94.7		%		50-150	11-MAR-20
2-Hexanone			79.0		%		50-150	11-MAR-20
Acetone			85.2		%		50-150	11-MAR-20
Benzene			90.4		%		50-150	11-MAR-20
Bromodichloromethane			91.0		%		50-150	11-MAR-20
Bromoform			87.2		%		50-150	11-MAR-20
Bromomethane			75.4		%		50-150	11-MAR-20
Carbon Disulfide			86.5		%		50-150	11-MAR-20
Carbon tetrachloride			95.4		%		50-150	11-MAR-20
Chlorobenzene			92.4		%		50-150	11-MAR-20
Chloroethane			97.1		%		50-150	11-MAR-20
Chloroform			91.8		%		50-150	11-MAR-20
Chloromethane			97.1		%		50-150	11-MAR-20
cis-1,2-Dichloroethylene			88.7		%		50-150	11-MAR-20
cis-1,3-Dichloropropene			84.4		%		50-150	11-MAR-20
Dibromochloromethane			88.0		%		50-150	11-MAR-20
Dichlorodifluoromethane			91.1		%		50-150	11-MAR-20
Dichloromethane			90.3		%		50-150	11-MAR-20



Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT	Water							
Batch	R5020890							
WG3289533-5 MS		WG3289533-3						
Ethylbenzene			92.1		%		50-150	11-MAR-20
m+p-Xylenes			92.5		%		50-150	11-MAR-20
Methyl Ethyl Ketone			64.4		%		50-150	11-MAR-20
Methyl Isobutyl Ketone			79.2		%		50-150	11-MAR-20
n-Hexane			83.9		%		50-150	11-MAR-20
MTBE			94.7		%		50-150	11-MAR-20
o-Xylene			99.6		%		50-150	11-MAR-20
Styrene			86.9		%		50-150	11-MAR-20
Tetrachloroethylene			93.8		%		50-150	11-MAR-20
Toluene			92.8		%		50-150	11-MAR-20
trans-1,2-Dichloroethylene			86.7		%		50-150	11-MAR-20
trans-1,3-Dichloropropene			84.5		%		50-150	11-MAR-20
Trichloroethylene			92.1		%		50-150	11-MAR-20
Trichlorofluoromethane			90.1		%		50-150	11-MAR-20
Vinyl chloride			103.0		%		50-150	11-MAR-20

Quality Control Report

Workorder: L2425943

Report Date: 11-MAR-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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

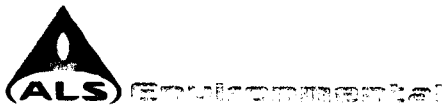
Hold Time Exceedances:

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.



Chain of Custody (COC) / Analytical Request Form



COC Number: 17 -

[Handwritten signature]

Canada Toll Free: 1 800 668 9878

L2425943-COFC

Page / of /

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Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)															
Company:	GHD LIMITED - ACCT #13791	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:	Laura Ermeta	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"/>		EMERGENCY	1 Business day [E - 100%] <input type="checkbox"/>												
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)] <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		2 day [P2-50%] <input type="checkbox"/>															
Street:	455 Phillip St	Email 1 or Fax:	laura.ermeta@ghd.com	Date and Time Required for all E&P TATs:																
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:		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								SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)							
Company:	GHD Limited	Email 1 or Fax:	laura.ermeta@ghd.com																	
Contact:	Laura Ermeta	Email 2:																		
Project Information		Oil and Gas Required Fields (client use)																		
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#																	
Job #:	44985-30-10	Major/Minor Code:	Routing Code:																	
PO / AFE:	73512223-1	Requisitioner:																		
LSD:		Location:																		
ALS Lab Work Order # (lab use only):	L2425943	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															
	EAST STORM POND	09-03-20	10:40	Water	2	X														
	WEST STORM POND	09-03-20	10:30	Water	2	X														
				Water																
				Water																
				Water																
				Water																
				Water																
				Water																
				Water																
				Water																
				Water																
Drinking Water (DW) Samples¹ (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					Frozen: <input type="checkbox"/> SJF 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 checked="" type="checkbox"/> Ice Cubes: <input type="checkbox"/> Custody seal Intact: Yes <input type="checkbox"/> No <input type="checkbox"/>															
					Cooling/filtered: <input type="checkbox"/>															
					INITIAL COOLER TEMPERATURES °C															
					FINAL COOLER TEMPERATURES °C															
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)															
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:	Received by:	Date:	Time:						
<i>[Signature]</i>	March 09/20	11:00					12/8			10-MAR-20	9:00									



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 17-MAR-20
Report Date: 18-MAR-20 11:16 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2428439
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2428439-1 EAST STORM POND Sampled By: CLIENT on 16-MAR-20 @ 11:10 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		18-MAR-20	R5028932
Benzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Bromodichloromethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Bromoform	<1.0		1.0	ug/L		18-MAR-20	R5028932
Bromomethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Carbon Disulfide	<1.0		1.0	ug/L		18-MAR-20	R5028932
Carbon tetrachloride	<0.20		0.20	ug/L		18-MAR-20	R5028932
Chlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dibromochloromethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Chloroethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
Chloroform	<1.0		1.0	ug/L		18-MAR-20	R5028932
Chloromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
1,2-Dibromoethane	<0.20		0.20	ug/L		18-MAR-20	R5028932
1,2-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,3-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,4-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dichlorodifluoromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
1,1-Dichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,2-Dichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dichloromethane	<2.0		2.0	ug/L		18-MAR-20	R5028932
1,2-Dichloropropane	<0.50		0.50	ug/L		18-MAR-20	R5028932
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		18-MAR-20	R5028932
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		18-MAR-20	R5028932
Ethylbenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
n-Hexane	<0.50		0.50	ug/L		18-MAR-20	R5028932
2-Hexanone	<20		20	ug/L		18-MAR-20	R5028932
Methyl Ethyl Ketone	<20		20	ug/L		18-MAR-20	R5028932
Methyl Isobutyl Ketone	<20		20	ug/L		18-MAR-20	R5028932
MTBE	<0.50		0.50	ug/L		18-MAR-20	R5028932
Styrene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Tetrachloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Toluene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,1-Trichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,2-Trichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Trichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Trichlorofluoromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932

* 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
L2428439-1 EAST STORM POND Sampled By: CLIENT on 16-MAR-20 @ 11:10 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		18-MAR-20	R5028932
o-Xylene	<0.30		0.30	ug/L		18-MAR-20	R5028932
m+p-Xylenes	<0.40		0.40	ug/L		18-MAR-20	R5028932
Xylenes (Total)	<0.50		0.50	ug/L		18-MAR-20	
Surrogate: 4-Bromofluorobenzene	98.9		70-130	%		18-MAR-20	R5028932
Surrogate: 1,4-Difluorobenzene	101.5		70-130	%		18-MAR-20	R5028932
Trihalomethanes							
Total THMs	<1.6		1.6	ug/L		18-MAR-20	
L2428439-2 WEST STORM POND Sampled By: CLIENT on 16-MAR-20 @ 11:20 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		18-MAR-20	R5028932
Benzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Bromodichloromethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Bromoform	<1.0		1.0	ug/L		18-MAR-20	R5028932
Bromomethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Carbon Disulfide	<1.0		1.0	ug/L		18-MAR-20	R5028932
Carbon tetrachloride	<0.20		0.20	ug/L		18-MAR-20	R5028932
Chlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dibromochloromethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Chloroethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
Chloroform	<1.0		1.0	ug/L		18-MAR-20	R5028932
Chloromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
1,2-Dibromoethane	<0.20		0.20	ug/L		18-MAR-20	R5028932
1,2-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,3-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,4-Dichlorobenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dichlorodifluoromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
1,1-Dichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,2-Dichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Dichloromethane	<2.0		2.0	ug/L		18-MAR-20	R5028932
1,2-Dichloropropane	<0.50		0.50	ug/L		18-MAR-20	R5028932
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		18-MAR-20	R5028932
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		18-MAR-20	R5028932
Ethylbenzene	<0.50		0.50	ug/L		18-MAR-20	R5028932
n-Hexane	<0.50		0.50	ug/L		18-MAR-20	R5028932
2-Hexanone	<20		20	ug/L		18-MAR-20	R5028932
Methyl Ethyl Ketone	<20		20	ug/L		18-MAR-20	R5028932

* 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
L2428439-2 WEST STORM POND							
Sampled By: CLIENT on 16-MAR-20 @ 11:20							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		18-MAR-20	R5028932
MTBE	<0.50		0.50	ug/L		18-MAR-20	R5028932
Styrene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Tetrachloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Toluene	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,1-Trichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
1,1,2-Trichloroethane	<0.50		0.50	ug/L		18-MAR-20	R5028932
Trichloroethylene	<0.50		0.50	ug/L		18-MAR-20	R5028932
Trichlorofluoromethane	<1.0		1.0	ug/L		18-MAR-20	R5028932
Vinyl chloride	<0.50		0.50	ug/L		18-MAR-20	R5028932
o-Xylene	<0.30		0.30	ug/L		18-MAR-20	R5028932
m+p-Xylenes	<0.40		0.40	ug/L		18-MAR-20	R5028932
Xylenes (Total)	<0.50		0.50	ug/L		18-MAR-20	
Surrogate: 4-Bromofluorobenzene	98.9		70-130	%		18-MAR-20	R5028932
Surrogate: 1,4-Difluorobenzene	101.5		70-130	%		18-MAR-20	R5028932
Trihalomethanes							
Total THMs	<1.6		1.6	ug/L		18-MAR-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2428439

Report Date: 18-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5028932							
WG3291411-4	DUP	WG3291411-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-MAR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	18-MAR-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	18-MAR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Bromodichloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	18-MAR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-MAR-20
Dibromochloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	18-MAR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-MAR-20
Methyl Isobutyl Ketone		<20	<20		ug/L			18-MAR-20



Quality Control Report

Workorder: L2428439

Report Date: 18-MAR-20

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5028932							
WG3291411-4	DUP	WG3291411-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	18-MAR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-MAR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	18-MAR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	18-MAR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	18-MAR-20
WG3291411-1	LCS							
1,1,1,2-Tetrachloroethane			92.6		%		70-130	18-MAR-20
1,1,1,2,2-Tetrachloroethane			93.2		%		70-130	18-MAR-20
1,1,1-Trichloroethane			101.9		%		70-130	18-MAR-20
1,1,2-Trichloroethane			87.2		%		70-130	18-MAR-20
1,2-Dibromoethane			83.8		%		70-130	18-MAR-20
1,1-Dichloroethane			99.97		%		70-130	18-MAR-20
1,1-Dichloroethylene			100.5		%		70-130	18-MAR-20
1,2-Dichlorobenzene			96.8		%		70-130	18-MAR-20
1,2-Dichloroethane			89.8		%		70-130	18-MAR-20
1,2-Dichloropropane			98.7		%		70-130	18-MAR-20
1,3-Dichlorobenzene			99.4		%		70-130	18-MAR-20
1,4-Dichlorobenzene			100.2		%		70-130	18-MAR-20
2-Hexanone			87.4		%		60-140	18-MAR-20
Acetone			95.9		%		60-140	18-MAR-20
Benzene			103.8		%		70-130	18-MAR-20
Bromodichloromethane			90.4		%		70-130	18-MAR-20
Bromoform			78.6		%		70-130	18-MAR-20
Bromomethane			87.4		%		60-140	18-MAR-20
Carbon Disulfide			101.3		%		70-130	18-MAR-20
Carbon tetrachloride			102.0		%		70-130	18-MAR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5028932							
WG3291411-1	LCS							
Chlorobenzene			98.2		%		70-130	18-MAR-20
Chloroethane			117.5		%		70-130	18-MAR-20
Chloroform			95.6		%		70-130	18-MAR-20
Chloromethane			124.8		%		60-140	18-MAR-20
cis-1,2-Dichloroethylene			89.5		%		70-130	18-MAR-20
cis-1,3-Dichloropropene			85.7		%		70-130	18-MAR-20
Dibromochloromethane			85.6		%		70-130	18-MAR-20
Dichlorodifluoromethane			101.3		%		50-140	18-MAR-20
Dichloromethane			99.7		%		70-130	18-MAR-20
Ethylbenzene			100.3		%		70-130	18-MAR-20
m+p-Xylenes			99.4		%		70-130	18-MAR-20
Methyl Ethyl Ketone			90.5		%		60-140	18-MAR-20
Methyl Isobutyl Ketone			89.8		%		50-150	18-MAR-20
n-Hexane			107.0		%		70-130	18-MAR-20
MTBE			99.2		%		70-130	18-MAR-20
o-Xylene			106.2		%		70-130	18-MAR-20
Styrene			91.9		%		70-130	18-MAR-20
Tetrachloroethylene			107.6		%		70-130	18-MAR-20
Toluene			103.2		%		70-130	18-MAR-20
trans-1,2-Dichloroethylene			108.1		%		70-130	18-MAR-20
trans-1,3-Dichloropropene			85.8		%		70-130	18-MAR-20
Trichloroethylene			102.3		%		70-130	18-MAR-20
Trichlorofluoromethane			102.2		%		60-140	18-MAR-20
Vinyl chloride			128.0		%		60-140	18-MAR-20
WG3291411-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	18-MAR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	18-MAR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	18-MAR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	18-MAR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	18-MAR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	18-MAR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	18-MAR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	18-MAR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	18-MAR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5028932							
WG3291411-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	18-MAR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	18-MAR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	18-MAR-20
2-Hexanone			<20		ug/L		20	18-MAR-20
Acetone			<20		ug/L		20	18-MAR-20
Benzene			<0.50		ug/L		0.5	18-MAR-20
Bromodichloromethane			<0.50		ug/L		0.5	18-MAR-20
Bromoform			<1.0		ug/L		1	18-MAR-20
Bromomethane			<0.50		ug/L		0.5	18-MAR-20
Carbon Disulfide			<1.0		ug/L		1	18-MAR-20
Carbon tetrachloride			<0.20		ug/L		0.2	18-MAR-20
Chlorobenzene			<0.50		ug/L		0.5	18-MAR-20
Chloroethane			<1.0		ug/L		1	18-MAR-20
Chloroform			<1.0		ug/L		1	18-MAR-20
Chloromethane			<1.0		ug/L		1	18-MAR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-MAR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	18-MAR-20
Dibromochloromethane			<0.50		ug/L		0.5	18-MAR-20
Dichlorodifluoromethane			<1.0		ug/L		1	18-MAR-20
Dichloromethane			<2.0		ug/L		2	18-MAR-20
Ethylbenzene			<0.50		ug/L		0.5	18-MAR-20
m+p-Xylenes			<0.40		ug/L		0.4	18-MAR-20
Methyl Ethyl Ketone			<20		ug/L		20	18-MAR-20
Methyl Isobutyl Ketone			<20		ug/L		20	18-MAR-20
n-Hexane			<0.50		ug/L		0.5	18-MAR-20
MTBE			<0.50		ug/L		0.5	18-MAR-20
o-Xylene			<0.30		ug/L		0.3	18-MAR-20
Styrene			<0.50		ug/L		0.5	18-MAR-20
Tetrachloroethylene			<0.50		ug/L		0.5	18-MAR-20
Toluene			<0.50		ug/L		0.5	18-MAR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	18-MAR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	18-MAR-20
Trichloroethylene			<0.50		ug/L		0.5	18-MAR-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5028932							
WG3291411-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	18-MAR-20
Vinyl chloride			<0.50		ug/L		0.5	18-MAR-20
Surrogate: 1,4-Difluorobenzene			100.8		%		70-130	18-MAR-20
Surrogate: 4-Bromofluorobenzene			98.4		%		70-130	18-MAR-20
WG3291411-5 MS		WG3291411-3						
1,1,1,2-Tetrachloroethane			92.6		%		50-150	18-MAR-20
1,1,2,2-Tetrachloroethane			95.2		%		50-150	18-MAR-20
1,1,1-Trichloroethane			99.6		%		50-150	18-MAR-20
1,1,2-Trichloroethane			90.4		%		50-150	18-MAR-20
1,2-Dibromoethane			88.3		%		50-150	18-MAR-20
1,1-Dichloroethane			99.9		%		50-150	18-MAR-20
1,1-Dichloroethylene			97.4		%		50-150	18-MAR-20
1,2-Dichlorobenzene			96.7		%		50-150	18-MAR-20
1,2-Dichloroethane			94.6		%		50-150	18-MAR-20
1,2-Dichloropropane			100.5		%		50-150	18-MAR-20
1,3-Dichlorobenzene			99.6		%		50-150	18-MAR-20
1,4-Dichlorobenzene			100.5		%		50-150	18-MAR-20
2-Hexanone			93.6		%		50-150	18-MAR-20
Acetone			102.1		%		50-150	18-MAR-20
Benzene			103.9		%		50-150	18-MAR-20
Bromodichloromethane			92.2		%		50-150	18-MAR-20
Bromoform			80.9		%		50-150	18-MAR-20
Bromomethane			87.0		%		50-150	18-MAR-20
Carbon Disulfide			98.7		%		50-150	18-MAR-20
Carbon tetrachloride			99.0		%		50-150	18-MAR-20
Chlorobenzene			98.2		%		50-150	18-MAR-20
Chloroethane			114.9		%		50-150	18-MAR-20
Chloroform			96.2		%		50-150	18-MAR-20
Chloromethane			121.4		%		50-150	18-MAR-20
cis-1,2-Dichloroethylene			90.0		%		50-150	18-MAR-20
cis-1,3-Dichloropropene			89.5		%		50-150	18-MAR-20
Dibromochloromethane			87.9		%		50-150	18-MAR-20
Dichlorodifluoromethane			93.5		%		50-150	18-MAR-20
Dichloromethane			102.3		%		50-150	18-MAR-20



Quality Control Report

Workorder: L2428439

Report Date: 18-MAR-20

Page 6 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5028932							
WG3291411-5	MS	WG3291411-3						
Ethylbenzene			98.5		%		50-150	18-MAR-20
m+p-Xylenes			97.9		%		50-150	18-MAR-20
Methyl Ethyl Ketone			96.0		%		50-150	18-MAR-20
Methyl Isobutyl Ketone			96.6		%		50-150	18-MAR-20
n-Hexane			101.4		%		50-150	18-MAR-20
MTBE			98.6		%		50-150	18-MAR-20
o-Xylene			104.9		%		50-150	18-MAR-20
Styrene			91.4		%		50-150	18-MAR-20
Tetrachloroethylene			105.0		%		50-150	18-MAR-20
Toluene			102.0		%		50-150	18-MAR-20
trans-1,2-Dichloroethylene			107.0		%		50-150	18-MAR-20
trans-1,3-Dichloropropene			90.0		%		50-150	18-MAR-20
Trichloroethylene			101.2		%		50-150	18-MAR-20
Trichlorofluoromethane			97.4		%		50-150	18-MAR-20
Vinyl chloride			123.0		%		50-150	18-MAR-20

Quality Control Report

Workorder: L2428439

Report Date: 18-MAR-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 7 of 7

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

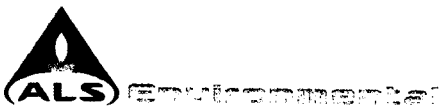
Hold Time Exceedances:

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.



Chain of Custody (COC) / Analytical Request Form



L2428439-COFC

COC Number: 17 -

Page 1 of 1

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

Report To Contact and company name below will appear on the final report Company: GHD LIMITED - ACCT #13791 Contact: Laura Ermeta Phone: 519-884-0510 Company address below will appear on the final report Street: 455 Phillip St City/Province: Waterloo, Ontario Postal Code: N2L 3X2		Report Format / Distribution 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: laura.ermeta@ghd.com Email 2: See PO Email 3:		Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply) 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"/> 3 day [P3-25%] <input type="checkbox"/> 2 day [P2-50%] <input type="checkbox"/> 1 Business day [E - 100%] <input type="checkbox"/> Same Day, Weekend or Statutory holiday [E2 -200% (Laboratory opening fees may apply)] <input type="checkbox"/> Date and Time Required for all E&P TATs: For tests that can not be performed according to the service level selected, you will be contacted.																																																																																																								
Invoice To 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: GHD Limited Contact: Laura Ermeta		Invoice Distribution Select Invoice Distribution: <input type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX Email 1 or Fax: laura.ermeta@ghd.com Email 2:		Analysis Request Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below <table border="1"> <tr> <td rowspan="10" style="writing-mode: vertical-rl; transform: rotate(180deg);">NUMBER OF CONTAINERS</td> <td colspan="10"></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="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> <tr><td colspan="10"></td></tr> </table>		NUMBER OF CONTAINERS											SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																																																																																										
NUMBER OF CONTAINERS											SAMPLES ON HOLD	SUSPECTED HAZARD (see Special Instructions)																																																																																																
Project Information ALS Account # / Quote #: 13791 Job #: 44985-30-10 PO / AFE: 73512223-1 LSD:		Oil and Gas Required Fields (client use) AFE/Cost Center: PO# Major/Minor Code: Routing Code: Requisitioner: Location:																																																																																																										
ALS Lab Work Order # (lab use only): L2428439		ALS Contact: Rick H		Sampler:																																																																																																								
ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report) EAST STAR Pond WEST STAR Pond	Date (dd-mmm-yy) 16-03-20 16-03-20	Time (hh:mm) 11:10 11:20	Sample Type Water Water Water Water Water Water Water Water Water	VOC-ROU-HS-WT																																																																																																							
Drinking Water (DW) Samples (client use) 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 checked="" type="checkbox"/> NO		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) Frozen <input checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/> Cooling Initiated <input type="checkbox"/> Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/> INITIAL COOLER TEMPERATURES °C: [] [] [] [] [] [] FINAL COOLER TEMPERATURES °C: [] [] [] [] [] []																																																																																																								
SHIPMENT RELEASE (client use) Released by: R. Tobin Date: March 16/20 Time: 16:20		INITIAL SHIPMENT RECEPTION (lab use only) Received by: Date: Time:		FINAL SHIPMENT RECEPTION (lab use only) Received by: [Signature] Date: 2/17/20 Time: 10:00																																																																																																								

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION
 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.
 WHITE - LABORATORY COPY YELLOW - CLIENT COPY
 JUNE 2014 FROTT



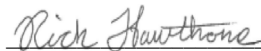
GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 24-MAR-20
Report Date: 25-MAR-20 10:02 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2430825
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
L2430825-1 EAST STORM POND Sampled By: CLIENT on 23-MAR-20 @ 11:15 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		25-MAR-20	R5037551
Benzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Bromodichloromethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Bromoform	<1.0		1.0	ug/L		25-MAR-20	R5037551
Bromomethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Carbon Disulfide	<1.0		1.0	ug/L		25-MAR-20	R5037551
Carbon tetrachloride	<0.20		0.20	ug/L		25-MAR-20	R5037551
Chlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dibromochloromethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Chloroethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
Chloroform	<1.0		1.0	ug/L		25-MAR-20	R5037551
Chloromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
1,2-Dibromoethane	<0.20		0.20	ug/L		25-MAR-20	R5037551
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dichlorodifluoromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
1,1-Dichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,2-Dichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dichloromethane	<2.0		2.0	ug/L		25-MAR-20	R5037551
1,2-Dichloropropane	<0.50		0.50	ug/L		25-MAR-20	R5037551
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-MAR-20	R5037551
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-MAR-20	R5037551
Ethylbenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
n-Hexane	<0.50		0.50	ug/L		25-MAR-20	R5037551
2-Hexanone	<20		20	ug/L		25-MAR-20	R5037551
Methyl Ethyl Ketone	<20		20	ug/L		25-MAR-20	R5037551
Methyl Isobutyl Ketone	<20		20	ug/L		25-MAR-20	R5037551
MTBE	<0.50		0.50	ug/L		25-MAR-20	R5037551
Styrene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Tetrachloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Toluene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Trichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Trichlorofluoromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551

* 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
L2430825-1 EAST STORM POND Sampled By: CLIENT on 23-MAR-20 @ 11:15 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		25-MAR-20	R5037551
o-Xylene	<0.30		0.30	ug/L		25-MAR-20	R5037551
m+p-Xylenes	<0.40		0.40	ug/L		25-MAR-20	R5037551
Xylenes (Total)	<0.50		0.50	ug/L		25-MAR-20	
Surrogate: 4-Bromofluorobenzene	93.9		70-130	%		25-MAR-20	R5037551
Surrogate: 1,4-Difluorobenzene	98.9		70-130	%		25-MAR-20	R5037551
Trihalomethanes							
Total THMs	<1.6		1.6	ug/L		25-MAR-20	
L2430825-2 WEST STORM POND Sampled By: CLIENT on 23-MAR-20 @ 10:45 Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		25-MAR-20	R5037551
Benzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Bromodichloromethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Bromoform	<1.0		1.0	ug/L		25-MAR-20	R5037551
Bromomethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Carbon Disulfide	<1.0		1.0	ug/L		25-MAR-20	R5037551
Carbon tetrachloride	<0.20		0.20	ug/L		25-MAR-20	R5037551
Chlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dibromochloromethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Chloroethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
Chloroform	<1.0		1.0	ug/L		25-MAR-20	R5037551
Chloromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
1,2-Dibromoethane	<0.20		0.20	ug/L		25-MAR-20	R5037551
1,2-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,3-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,4-Dichlorobenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dichlorodifluoromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
1,1-Dichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,2-Dichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Dichloromethane	<2.0		2.0	ug/L		25-MAR-20	R5037551
1,2-Dichloropropane	<0.50		0.50	ug/L		25-MAR-20	R5037551
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		25-MAR-20	R5037551
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		25-MAR-20	R5037551
Ethylbenzene	<0.50		0.50	ug/L		25-MAR-20	R5037551
n-Hexane	<0.50		0.50	ug/L		25-MAR-20	R5037551
2-Hexanone	<20		20	ug/L		25-MAR-20	R5037551
Methyl Ethyl Ketone	<20		20	ug/L		25-MAR-20	R5037551

* 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
L2430825-2 WEST STORM POND							
Sampled By: CLIENT on 23-MAR-20 @ 10:45							
Matrix: WATER							
Volatile Organic Compounds							
Methyl Isobutyl Ketone	<20		20	ug/L		25-MAR-20	R5037551
MTBE	<0.50		0.50	ug/L		25-MAR-20	R5037551
Styrene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Tetrachloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Toluene	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,1-Trichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
1,1,2-Trichloroethane	<0.50		0.50	ug/L		25-MAR-20	R5037551
Trichloroethylene	<0.50		0.50	ug/L		25-MAR-20	R5037551
Trichlorofluoromethane	<1.0		1.0	ug/L		25-MAR-20	R5037551
Vinyl chloride	<0.50		0.50	ug/L		25-MAR-20	R5037551
o-Xylene	<0.30		0.30	ug/L		25-MAR-20	R5037551
m+p-Xylenes	<0.40		0.40	ug/L		25-MAR-20	R5037551
Xylenes (Total)	<0.50		0.50	ug/L		25-MAR-20	
Surrogate: 4-Bromofluorobenzene	93.7		70-130	%		25-MAR-20	R5037551
Surrogate: 1,4-Difluorobenzene	98.8		70-130	%		25-MAR-20	R5037551
Trihalomethanes							
Total THMs	<1.6		1.6	ug/L		25-MAR-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2430825

Report Date: 25-MAR-20

Page 1 of 7

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5037551							
WG3298285-4	DUP	WG3298285-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-MAR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	25-MAR-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	25-MAR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Bromodichloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	25-MAR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-MAR-20
Dibromochloromethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	25-MAR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-MAR-20
Methyl Isobutyl Ketone		<20	<20		ug/L			25-MAR-20



Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5037551							
WG3298285-4	DUP	WG3298285-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	25-MAR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-MAR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Toluene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	25-MAR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	25-MAR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	25-MAR-20
WG3298285-1	LCS							
1,1,1,2-Tetrachloroethane			93.4		%		70-130	25-MAR-20
1,1,1,2,2-Tetrachloroethane			91.7		%		70-130	25-MAR-20
1,1,1-Trichloroethane			101.0		%		70-130	25-MAR-20
1,1,2-Trichloroethane			91.5		%		70-130	25-MAR-20
1,2-Dibromoethane			88.4		%		70-130	25-MAR-20
1,1-Dichloroethane			97.1		%		70-130	25-MAR-20
1,1-Dichloroethylene			99.1		%		70-130	25-MAR-20
1,2-Dichlorobenzene			101.1		%		70-130	25-MAR-20
1,2-Dichloroethane			93.8		%		70-130	25-MAR-20
1,2-Dichloropropane			98.0		%		70-130	25-MAR-20
1,3-Dichlorobenzene			103.8		%		70-130	25-MAR-20
1,4-Dichlorobenzene			105.2		%		70-130	25-MAR-20
2-Hexanone			89.9		%		60-140	25-MAR-20
Acetone			96.9		%		60-140	25-MAR-20
Benzene			102.5		%		70-130	25-MAR-20
Bromodichloromethane			99.2		%		70-130	25-MAR-20
Bromoform			83.1		%		70-130	25-MAR-20
Bromomethane			87.9		%		60-140	25-MAR-20
Carbon Disulfide			104.3		%		70-130	25-MAR-20
Carbon tetrachloride			101.9		%		70-130	25-MAR-20



Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5037551							
WG3298285-1	LCS							
Chlorobenzene			100.2		%		70-130	25-MAR-20
Chloroethane			112.1		%		70-130	25-MAR-20
Chloroform			100.4		%		70-130	25-MAR-20
Chloromethane			112.0		%		60-140	25-MAR-20
cis-1,2-Dichloroethylene			95.8		%		70-130	25-MAR-20
cis-1,3-Dichloropropene			97.0		%		70-130	25-MAR-20
Dibromochloromethane			87.5		%		70-130	25-MAR-20
Dichlorodifluoromethane			105.4		%		50-140	25-MAR-20
Dichloromethane			94.2		%		70-130	25-MAR-20
Ethylbenzene			100.7		%		70-130	25-MAR-20
m+p-Xylenes			104.4		%		70-130	25-MAR-20
Methyl Ethyl Ketone			88.5		%		60-140	25-MAR-20
Methyl Isobutyl Ketone			90.5		%		50-150	25-MAR-20
n-Hexane			96.2		%		70-130	25-MAR-20
MTBE			100.2		%		70-130	25-MAR-20
o-Xylene			110.8		%		70-130	25-MAR-20
Styrene			95.3		%		70-130	25-MAR-20
Tetrachloroethylene			98.3		%		70-130	25-MAR-20
Toluene			104.3		%		70-130	25-MAR-20
trans-1,2-Dichloroethylene			95.9		%		70-130	25-MAR-20
trans-1,3-Dichloropropene			95.7		%		70-130	25-MAR-20
Trichloroethylene			100.7		%		70-130	25-MAR-20
Trichlorofluoromethane			101.7		%		60-140	25-MAR-20
Vinyl chloride			118.4		%		60-140	25-MAR-20
WG3298285-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	25-MAR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	25-MAR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	25-MAR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	25-MAR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	25-MAR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	25-MAR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	25-MAR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	25-MAR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	25-MAR-20



Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5037551							
WG3298285-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	25-MAR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	25-MAR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	25-MAR-20
2-Hexanone			<20		ug/L		20	25-MAR-20
Acetone			<20		ug/L		20	25-MAR-20
Benzene			<0.50		ug/L		0.5	25-MAR-20
Bromodichloromethane			<0.50		ug/L		0.5	25-MAR-20
Bromoform			<1.0		ug/L		1	25-MAR-20
Bromomethane			<0.50		ug/L		0.5	25-MAR-20
Carbon Disulfide			<1.0		ug/L		1	25-MAR-20
Carbon tetrachloride			<0.20		ug/L		0.2	25-MAR-20
Chlorobenzene			<0.50		ug/L		0.5	25-MAR-20
Chloroethane			<1.0		ug/L		1	25-MAR-20
Chloroform			<1.0		ug/L		1	25-MAR-20
Chloromethane			<1.0		ug/L		1	25-MAR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-MAR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	25-MAR-20
Dibromochloromethane			<0.50		ug/L		0.5	25-MAR-20
Dichlorodifluoromethane			<1.0		ug/L		1	25-MAR-20
Dichloromethane			<2.0		ug/L		2	25-MAR-20
Ethylbenzene			<0.50		ug/L		0.5	25-MAR-20
m+p-Xylenes			<0.40		ug/L		0.4	25-MAR-20
Methyl Ethyl Ketone			<20		ug/L		20	25-MAR-20
Methyl Isobutyl Ketone			<20		ug/L		20	25-MAR-20
n-Hexane			<0.50		ug/L		0.5	25-MAR-20
MTBE			<0.50		ug/L		0.5	25-MAR-20
o-Xylene			<0.30		ug/L		0.3	25-MAR-20
Styrene			<0.50		ug/L		0.5	25-MAR-20
Tetrachloroethylene			<0.50		ug/L		0.5	25-MAR-20
Toluene			<0.50		ug/L		0.5	25-MAR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	25-MAR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	25-MAR-20
Trichloroethylene			<0.50		ug/L		0.5	25-MAR-20



Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5037551							
WG3298285-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	25-MAR-20
Vinyl chloride			<0.50		ug/L		0.5	25-MAR-20
Surrogate: 1,4-Difluorobenzene			99.9		%		70-130	25-MAR-20
Surrogate: 4-Bromofluorobenzene			93.9		%		70-130	25-MAR-20
WG3298285-5 MS		WG3298285-3						
1,1,1,2-Tetrachloroethane			93.5		%		50-150	25-MAR-20
1,1,2,2-Tetrachloroethane			92.5		%		50-150	25-MAR-20
1,1,1-Trichloroethane			99.5		%		50-150	25-MAR-20
1,1,2-Trichloroethane			93.1		%		50-150	25-MAR-20
1,2-Dibromoethane			90.0		%		50-150	25-MAR-20
1,1-Dichloroethane			102.3		%		50-150	25-MAR-20
1,1-Dichloroethylene			94.6		%		50-150	25-MAR-20
1,2-Dichlorobenzene			101.1		%		50-150	25-MAR-20
1,2-Dichloroethane			96.4		%		50-150	25-MAR-20
1,2-Dichloropropane			100.1		%		50-150	25-MAR-20
1,3-Dichlorobenzene			103.0		%		50-150	25-MAR-20
1,4-Dichlorobenzene			104.7		%		50-150	25-MAR-20
2-Hexanone			91.1		%		50-150	25-MAR-20
Acetone			101.1		%		50-150	25-MAR-20
Benzene			102.8		%		50-150	25-MAR-20
Bromodichloromethane			101.7		%		50-150	25-MAR-20
Bromoform			84.4		%		50-150	25-MAR-20
Bromomethane			83.4		%		50-150	25-MAR-20
Carbon Disulfide			97.9		%		50-150	25-MAR-20
Carbon tetrachloride			99.98		%		50-150	25-MAR-20
Chlorobenzene			99.96		%		50-150	25-MAR-20
Chloroethane			106.9		%		50-150	25-MAR-20
Chloroform			101.4		%		50-150	25-MAR-20
Chloromethane			104.4		%		50-150	25-MAR-20
cis-1,2-Dichloroethylene			95.9		%		50-150	25-MAR-20
cis-1,3-Dichloropropene			97.3		%		50-150	25-MAR-20
Dibromochloromethane			88.6		%		50-150	25-MAR-20
Dichlorodifluoromethane			96.8		%		50-150	25-MAR-20
Dichloromethane			94.0		%		50-150	25-MAR-20



Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5037551							
WG3298285-5 MS		WG3298285-3						
Ethylbenzene			99.2		%		50-150	25-MAR-20
m+p-Xylenes			102.7		%		50-150	25-MAR-20
Methyl Ethyl Ketone			92.3		%		50-150	25-MAR-20
Methyl Isobutyl Ketone			94.9		%		50-150	25-MAR-20
n-Hexane			89.6		%		50-150	25-MAR-20
MTBE			100.6		%		50-150	25-MAR-20
o-Xylene			109.8		%		50-150	25-MAR-20
Styrene			94.8		%		50-150	25-MAR-20
Tetrachloroethylene			94.5		%		50-150	25-MAR-20
Toluene			102.3		%		50-150	25-MAR-20
trans-1,2-Dichloroethylene			93.1		%		50-150	25-MAR-20
trans-1,3-Dichloropropene			93.7		%		50-150	25-MAR-20
Trichloroethylene			99.8		%		50-150	25-MAR-20
Trichlorofluoromethane			95.7		%		50-150	25-MAR-20
Vinyl chloride			109.5		%		50-150	25-MAR-20

Quality Control Report

Workorder: L2430825

Report Date: 25-MAR-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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

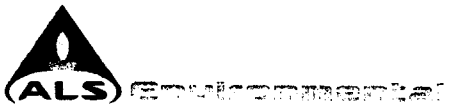
Hold Time Exceedances:

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.



Chain of Custody (COC) / Analytical Request Form



COC Number: 17 -

Canada Toll Free: 1 800 668 9878

L2430825-COFC

Page / of

www.alsglobal.com

Report To Contact and company name below will appear on the final report		Report Format / Distribution			Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)						
Company:	GHD LIMITED - ACCT #13791	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				EMERGENCY			
Contact:	Laura Ermeta	Quality Control (QC) Report with Report	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	4 day [P4-20%] <input type="checkbox"/>				1 Business day [E - 100%] <input type="checkbox"/>			
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%] <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	2 day [P2-50%] <input type="checkbox"/>				(Laboratory opening fees may apply) <input type="checkbox"/>			
Street:	455 Phillip St	Email 1 or Fax	laura.ermeta@ghd.com	Date and Time Required for all E&P TATs:							
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		Analysis Request					SAMPLES ON HOLD		
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								
Company:	GHD Limited	Email 1 or Fax	laura.ermeta@ghd.com								
Contact:	Laura Ermeta	Email 2									
Project Information		Oil and Gas Required Fields (client use)									
ALS Account # / Quote #:	13791	AFE/Cost Center:	PO#								
Job #:	44985-30-10	Major/Minor Code:	Routing Code:								
PO / AFE:	73512223-1	Requisitioner:									
LSD:		Location:									
ALS Lab Work Order # (lab use only):		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							
	EAST STORM POND	23-03-20	11:15	Water	2	X					
	WEST STORM POND	23-03-20	10:45	Water	2	X					
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
				Water							
Drinking Water (DW) Samples¹ (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					Frozen: <input checked="" 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 checked="" type="checkbox"/> Ice Cubes <input type="checkbox"/> Custody seal-Intact Yes <input type="checkbox"/> No <input type="checkbox"/>						
					Cooling/insulated <input type="checkbox"/>						
					INITIAL COOLER TEMPERATURES °C						
					FINAL COOLER TEMPERATURES °C						
					11.9°C						
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)						
Released by:	R. Tobin	Date:	March 23/20	Time:	11:30	Received by:		Date:	24/03/20	Time:	9:45AM

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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 14-APR-20
Report Date: 16-APR-20 06:34 (MT)
Version: FINAL REV. 2

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2436385
Project P.O. #: 73512223
Job Reference: 44985-20-19
C of C Numbers:
Legal Site Desc:

Comments:

16-APR-2020 PO, Job and Account number updated

Dana Brown, Chem. Tech. DIPL
Account Manager

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Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MICROTOX-ORG-ED	Water	Microtox Original	ERCB Directive 050
<p>Light output of luminescent bacteria is measured after they have been challenged by a sample of unknown toxicity, and compared to the light output of a control reagent blank. The difference in light output is attributed to the effect of the sample on the organisms, and the degree of light loss indicates metabolic inhibition and the degree of toxicity of the sample to the bacteria. EC50(5) and EC50(15) values are reported, and refer to the effective concentration of the sample that caused a 50% decrease in the light output in 5 and 15 minutes.</p>			
MICROTOX-PHYSICAL-ED	Water	Microtox Physical Tests	ERCB Directive 050

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, 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.



Environmental

Quality Control Report

Workorder: L2436385

Report Date: 16-APR-20

Page 1 of 2

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MICROTOX-ORG-ED								
	Water							
Batch	R5056677							
WG3307833-2 CRM		PHENOL_ED						
EC50 (5min) Original			16.6		mg/L		13-26	15-APR-20
WG3307833-3 CRM		PHENOL_ED						
EC50 (5min) Original			19.9		mg/L		13-26	15-APR-20
WG3307833-4 DUP		L2436385-1						
EC50 (15min) Original		>100	>100	RPD-NA	%	N/A		15-APR-20
EC20 (15min) Original		>100	>100	RPD-NA	%	N/A		15-APR-20
EC50 (5min) Original		>100	>100	RPD-NA	%	N/A		15-APR-20
EC20 (5min) Original		>100	>100	RPD-NA	%	N/A		15-APR-20
WG3307833-1 MB								
EC50 (15min) Original			PASS					15-APR-20
EC20 (15min) Original			PASS					15-APR-20
EC50 (5min) Original			PASS					15-APR-20
EC20 (5min) Original			PASS					15-APR-20

Quality Control Report

Workorder: L2436385

Report Date: 16-APR-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 2 of 2

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
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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 14-APR-20
Report Date: 22-APR-20 09:55 (MT)
Version: FINAL REV. 2

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2436395
Project P.O. #: 73506479
Job Reference: 44985-20-19
C of C Numbers:
Legal Site Desc:

Comments:

22-APR-2020 Field Parameter entry date revised to coincide with analysis date.

Rick Hawthorne
Account Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2436395-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-APR-20 @ 11:00							
Matrix: WATER							
Field Tests							
pH, Client Supplied	7.70		0.10	pH	21-APR-20	21-APR-20	R5059203
Temperature, Client	14.4		-50	Deg. C	21-APR-20	21-APR-20	R5059203
Physical Tests							
Conductivity	737		3.0	umhos/cm		15-APR-20	R5057403
Hardness (as CaCO3)	280	HTC	1.3	mg/L		15-APR-20	
pH	8.28		0.10	pH units		15-APR-20	R5057403
Total Suspended Solids	5.6		2.0	mg/L	17-APR-20	20-APR-20	R5058422
Total Dissolved Solids	458	DLDS	20	mg/L		16-APR-20	R5057880
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	150		10	mg/L		15-APR-20	R5057403
Unionized ammonia	0.00705		0.00078	mg/L		22-APR-20	
Ammonia, Total (as N)	0.449	DLHC	0.050	mg/L		16-APR-20	R5057374
Bromide (Br)	1.47		0.10	mg/L		15-APR-20	R5057532
Chloride (Cl)	65.4		0.50	mg/L		15-APR-20	R5057532
Fluoride (F)	0.523		0.020	mg/L		15-APR-20	R5057532
Nitrate (as N)	0.111		0.020	mg/L		15-APR-20	R5057532
Nitrite (as N)	<0.010		0.010	mg/L		15-APR-20	R5057532
Total Kjeldahl Nitrogen	0.91		0.15	mg/L	15-APR-20	15-APR-20	R5057049
Phosphorus, Total	0.0311		0.0030	mg/L	14-APR-20	15-APR-20	R5056908
Sulfate (SO4)	148		0.30	mg/L		15-APR-20	R5057532
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-APR-20	R5056867
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					15-APR-20	R5056770
Dissolved Organic Carbon	5.41		0.50	mg/L	15-APR-20	16-APR-20	R5057388
Total Metals							
Aluminum (Al)-Total	0.154		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Antimony (Sb)-Total	0.00040		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Arsenic (As)-Total	0.00151		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Barium (Ba)-Total	0.0593		0.00020	mg/L	14-APR-20	15-APR-20	R5056853
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Boron (B)-Total	0.180		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Cadmium (Cd)-Total	<0.00010	DLM	0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Calcium (Ca)-Total	74.9		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Cobalt (Co)-Total	0.00035		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Copper (Cu)-Total	0.0015		0.0010	mg/L	14-APR-20	15-APR-20	R5056853
Iron (Fe)-Total	0.160		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Lead (Pb)-Total	0.00022		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Magnesium (Mg)-Total	22.5		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Manganese (Mn)-Total	0.113		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		15-APR-20	R5057094

* 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
L2436395-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-APR-20 @ 11:00							
Matrix: WATER							
Total Metals							
Molybdenum (Mo)-Total	0.0659		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Nickel (Ni)-Total	0.00396		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Potassium (K)-Total	18.1		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Selenium (Se)-Total	0.00119		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Silicon (Si)-Total	1.09		0.10	mg/L	14-APR-20	15-APR-20	R5056853
Silver (Ag)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Sodium (Na)-Total	43.5		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Strontium (Sr)-Total	0.580		0.0010	mg/L	14-APR-20	15-APR-20	R5056853
Thallium (Tl)-Total	0.000099		0.000010	mg/L	14-APR-20	15-APR-20	R5056853
Tin (Sn)-Total	0.00016		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Vanadium (V)-Total	0.00058		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	14-APR-20	15-APR-20	R5056853
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		15-APR-20	R5057209
Aggregate Organics							
COD	25		10	mg/L		20-APR-20	R5058626
Phenols (4AAP)	0.0021		0.0010	mg/L		14-APR-20	R5056996
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-APR-20	R5056729
Benzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Bromodichloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromoform	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromomethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Carbon tetrachloride	<0.50		0.50	ug/L		15-APR-20	R5056729
Chlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dibromochloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroform	<1.0		1.0	ug/L		15-APR-20	R5056729
1,2-Dibromoethane	<0.20		0.20	ug/L		15-APR-20	R5056729
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
1,1-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,2-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichloromethane	<2.0		2.0	ug/L		15-APR-20	R5056729
1,2-Dichloropropane	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729

* 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
L2436395-1 EQ POND DISCHARGE							
Sampled By: CLIENT on 13-APR-20 @ 11:00							
Matrix: WATER							
Volatile Organic Compounds							
Ethylbenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
n-Hexane	<0.50		0.50	ug/L		15-APR-20	R5056729
Methyl Ethyl Ketone	<20		20	ug/L		15-APR-20	R5056729
Methyl Isobutyl Ketone	<20		20	ug/L		15-APR-20	R5056729
MTBE	<0.50		0.50	ug/L		15-APR-20	R5056729
Styrene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Tetrachloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Toluene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichlorofluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Vinyl chloride	<0.50		0.50	ug/L		15-APR-20	R5056729
o-Xylene	<0.50		0.50	ug/L		15-APR-20	R5056729
m+p-Xylenes	<1.0		1.0	ug/L		15-APR-20	R5056729
Xylenes (Total)	<1.1		1.1	ug/L		15-APR-20	
Surrogate: 4-Bromofluorobenzene	97.3		70-130	%		15-APR-20	R5056729
Surrogate: 1,4-Difluorobenzene	100.5		70-130	%		15-APR-20	R5056729
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-APR-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057433
Surrogate: 2,4,6-Tribromophenol	116.1		40-150	%	15-APR-20	17-APR-20	R5057433
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Acenaphthylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)pyrene	<0.050		0.050	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(b)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(ghi)perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(k)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
4-Chloroaniline	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2-Chlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Chrysene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1,2-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,3-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,4-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493

* 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
L2436395-1 EQ POND DISCHARGE Sampled By: CLIENT on 13-APR-20 @ 11:00 Matrix: WATER							
Semi-Volatile Organics							
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dichlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Diethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dimethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dimethylphenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrophenol	<1.0		1.0	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,6-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	15-APR-20	17-APR-20	R5057493
Fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Fluorene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobenzene	<0.040		0.040	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobutadiene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Naphthalene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pentachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Phenanthrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Surrogate: 2-Fluorobiphenyl	91.6		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: Nitrobenzene d5	98.6		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: p-Terphenyl d14	98.4		40-130	%	15-APR-20	17-APR-20	R5057493
Report Remarks : raised Cd LOR to remove potential Mo interference							
L2436395-2 WEST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:30 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.80		0.10	pH	21-APR-20	21-APR-20	R5059203
Temperature, Client	15.6		-50	Deg. C	21-APR-20	21-APR-20	R5059203
Physical Tests							
Conductivity	987		3.0	umhos/cm		15-APR-20	R5057403
Hardness (as CaCO3)	429	HTC	1.3	mg/L		15-APR-20	
pH	8.17		0.10	pH units		15-APR-20	R5057403
Total Suspended Solids	17.6		2.0	mg/L	17-APR-20	20-APR-20	R5058422
Total Dissolved Solids	666	DLDS	20	mg/L		16-APR-20	R5057880

* 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
L2436395-2 WEST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:30 Matrix: WATER							
Physical Tests							
Anions and Nutrients							
Alkalinity, Total (as CaCO ₃)	189		10	mg/L		15-APR-20	R5057403
Unionized ammonia	0.00584		0.00022	mg/L		22-APR-20	
Ammonia, Total (as N)	0.271		0.010	mg/L		16-APR-20	R5057374
Bromide (Br)	0.90		0.10	mg/L		15-APR-20	R5057532
Chloride (Cl)	86.8		0.50	mg/L		15-APR-20	R5057532
Fluoride (F)	0.578		0.020	mg/L		15-APR-20	R5057532
Nitrate (as N)	0.082		0.020	mg/L		15-APR-20	R5057532
Nitrite (as N)	<0.010		0.010	mg/L		15-APR-20	R5057532
Total Kjeldahl Nitrogen	0.85		0.15	mg/L	15-APR-20	15-APR-20	R5057049
Phosphorus, Total	0.0531		0.0030	mg/L	14-APR-20	15-APR-20	R5056908
Sulfate (SO ₄)	226		0.30	mg/L		15-APR-20	R5057532
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-APR-20	R5056867
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					15-APR-20	R5056770
Dissolved Organic Carbon	7.86		0.50	mg/L	15-APR-20	16-APR-20	R5057388
Total Metals							
Aluminum (Al)-Total	1.36		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Antimony (Sb)-Total	0.00053		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Arsenic (As)-Total	0.00191		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Barium (Ba)-Total	0.0766		0.00020	mg/L	14-APR-20	15-APR-20	R5056853
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Boron (B)-Total	0.133		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Cadmium (Cd)-Total	<0.00030	DLM	0.00030	mg/L	14-APR-20	15-APR-20	R5056853
Calcium (Ca)-Total	114		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Cobalt (Co)-Total	0.00121		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Copper (Cu)-Total	0.0346		0.0010	mg/L	14-APR-20	15-APR-20	R5056853
Iron (Fe)-Total	1.60		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Lead (Pb)-Total	0.00345		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Magnesium (Mg)-Total	35.3		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Manganese (Mn)-Total	0.112		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Mercury (Hg)-Total	0.0000238		0.0000050	mg/L		15-APR-20	R5057094
Molybdenum (Mo)-Total	0.0688		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Nickel (Ni)-Total	0.00739		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Potassium (K)-Total	19.3		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Selenium (Se)-Total	0.00121		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Silicon (Si)-Total	4.31		0.10	mg/L	14-APR-20	15-APR-20	R5056853
Silver (Ag)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Sodium (Na)-Total	57.0		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Strontium (Sr)-Total	0.861		0.0010	mg/L	14-APR-20	15-APR-20	R5056853

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2436395-2 WEST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:30 Matrix: WATER							
Total Metals							
Thallium (Tl)-Total	0.000201		0.000010	mg/L	14-APR-20	15-APR-20	R5056853
Tin (Sn)-Total	0.00131		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Vanadium (V)-Total	0.00304		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Zinc (Zn)-Total	0.0137		0.0030	mg/L	14-APR-20	15-APR-20	R5056853
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		15-APR-20	R5057209
Aggregate Organics							
COD	37		10	mg/L		20-APR-20	R5058626
Phenols (4AAP)	0.0022		0.0010	mg/L		14-APR-20	R5056996
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-APR-20	R5056729
Benzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Bromodichloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromoform	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromomethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Carbon tetrachloride	<0.50		0.50	ug/L		15-APR-20	R5056729
Chlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dibromochloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroform	<1.0		1.0	ug/L		15-APR-20	R5056729
1,2-Dibromoethane	<0.20		0.20	ug/L		15-APR-20	R5056729
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
1,1-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,2-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichloromethane	<2.0		2.0	ug/L		15-APR-20	R5056729
1,2-Dichloropropane	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729
Ethylbenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
n-Hexane	<0.50		0.50	ug/L		15-APR-20	R5056729
Methyl Ethyl Ketone	<20		20	ug/L		15-APR-20	R5056729
Methyl Isobutyl Ketone	<20		20	ug/L		15-APR-20	R5056729
MTBE	<0.50		0.50	ug/L		15-APR-20	R5056729
Styrene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2436395-2 WEST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:30 Matrix: WATER							
Volatile Organic Compounds							
Tetrachloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Toluene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichlorofluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Vinyl chloride	<0.50		0.50	ug/L		15-APR-20	R5056729
o-Xylene	<0.50		0.50	ug/L		15-APR-20	R5056729
m+p-Xylenes	<1.0		1.0	ug/L		15-APR-20	R5056729
Xylenes (Total)	<1.1		1.1	ug/L		15-APR-20	
Surrogate: 4-Bromofluorobenzene	97.2		70-130	%		15-APR-20	R5056729
Surrogate: 1,4-Difluorobenzene	101.0		70-130	%		15-APR-20	R5056729
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-APR-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057433
Surrogate: 2,4,6-Tribromophenol	118.1		40-150	%	15-APR-20	17-APR-20	R5057433
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Acenaphthylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)pyrene	<0.050		0.050	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(b)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(ghi)perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(k)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
4-Chloroaniline	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2-Chlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Chrysene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1,2-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,3-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,4-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dichlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Diethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dimethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dimethylphenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrophenol	<1.0		1.0	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,6-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2436395-2 WEST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:30 Matrix: WATER							
Semi-Volatile Organics							
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	15-APR-20	17-APR-20	R5057493
Fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Fluorene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobenzene	<0.040		0.040	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobutadiene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Naphthalene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pentachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Phenanthrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Surrogate: 2-Fluorobiphenyl	90.3		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: Nitrobenzene d5	97.2		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: p-Terphenyl d14	90.2		40-130	%	15-APR-20	17-APR-20	R5057493
Report Remarks : raised Cd LOR to remove potential	Mo interference						
L2436395-3 EAST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:00 Matrix: WATER							
Field Tests							
pH, Client Supplied	7.60		0.10	pH	21-APR-20	21-APR-20	R5059203
Temperature, Client	14.4		-50	Deg. C	21-APR-20	21-APR-20	R5059203
Physical Tests							
Conductivity	742		3.0	umhos/cm		15-APR-20	R5057403
Hardness (as CaCO3)	285	HTC	1.3	mg/L		15-APR-20	
pH	8.23		0.10	pH units		15-APR-20	R5057403
Total Suspended Solids	8.1		2.0	mg/L	17-APR-20	20-APR-20	R5058422
Total Dissolved Solids	473	DLDS	20	mg/L		16-APR-20	R5057880
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	145		10	mg/L		15-APR-20	R5057403
Unionized ammonia	0.00169		0.00012	mg/L		22-APR-20	
Ammonia, Total (as N)	0.135		0.010	mg/L		16-APR-20	R5057374
Bromide (Br)	1.30		0.10	mg/L		15-APR-20	R5057532
Chloride (Cl)	68.6		0.50	mg/L		15-APR-20	R5057532
Fluoride (F)	0.493		0.020	mg/L		15-APR-20	R5057532
Nitrate (as N)	0.044		0.020	mg/L		15-APR-20	R5057532

* 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
L2436395-3 EAST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:00 Matrix: WATER							
Anions and Nutrients							
Nitrite (as N)	<0.010		0.010	mg/L		15-APR-20	R5057532
Total Kjeldahl Nitrogen	0.77		0.15	mg/L	15-APR-20	15-APR-20	R5057049
Phosphorus, Total	0.0327		0.0030	mg/L	14-APR-20	15-APR-20	R5056908
Sulfate (SO4)	156		0.30	mg/L		15-APR-20	R5057532
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		14-APR-20	R5056867
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	LAB					15-APR-20	R5056770
Dissolved Organic Carbon	8.49		0.50	mg/L	15-APR-20	16-APR-20	R5057388
Total Metals							
Aluminum (Al)-Total	0.280		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Antimony (Sb)-Total	0.00037		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Arsenic (As)-Total	0.00161		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Barium (Ba)-Total	0.0592		0.00020	mg/L	14-APR-20	15-APR-20	R5056853
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Boron (B)-Total	0.110		0.010	mg/L	14-APR-20	15-APR-20	R5056853
Cadmium (Cd)-Total	<0.00010	DLM	0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Calcium (Ca)-Total	75.2		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Cobalt (Co)-Total	0.00047		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Copper (Cu)-Total	0.0026		0.0010	mg/L	14-APR-20	15-APR-20	R5056853
Iron (Fe)-Total	0.316		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Lead (Pb)-Total	0.00030		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Magnesium (Mg)-Total	23.7		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Manganese (Mn)-Total	0.0506		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		15-APR-20	R5057094
Molybdenum (Mo)-Total	0.0605		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Nickel (Ni)-Total	0.00436		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Potassium (K)-Total	16.8		0.050	mg/L	14-APR-20	15-APR-20	R5056853
Selenium (Se)-Total	0.00121		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Silicon (Si)-Total	1.37		0.10	mg/L	14-APR-20	15-APR-20	R5056853
Silver (Ag)-Total	<0.000050		0.000050	mg/L	14-APR-20	15-APR-20	R5056853
Sodium (Na)-Total	43.7		0.50	mg/L	14-APR-20	15-APR-20	R5056853
Strontium (Sr)-Total	0.589		0.0010	mg/L	14-APR-20	15-APR-20	R5056853
Thallium (Tl)-Total	0.000083		0.000010	mg/L	14-APR-20	15-APR-20	R5056853
Tin (Sn)-Total	0.00035		0.00010	mg/L	14-APR-20	15-APR-20	R5056853
Vanadium (V)-Total	0.00070		0.00050	mg/L	14-APR-20	15-APR-20	R5056853
Zinc (Zn)-Total	0.0046		0.0030	mg/L	14-APR-20	15-APR-20	R5056853
Speciated Metals							
Chromium, Hexavalent	<0.00050		0.00050	mg/L		15-APR-20	R5057209
Aggregate Organics							
COD	32		10	mg/L		20-APR-20	R5058626

* 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
L2436395-3 EAST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:00 Matrix: WATER							
Aggregate Organics							
Phenols (4AAP)	0.0024		0.0010	mg/L		14-APR-20	R5056996
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-APR-20	R5056729
Benzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Bromodichloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromoform	<1.0		1.0	ug/L		15-APR-20	R5056729
Bromomethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Carbon tetrachloride	<0.50		0.50	ug/L		15-APR-20	R5056729
Chlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dibromochloromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Chloroform	<1.0		1.0	ug/L		15-APR-20	R5056729
1,2-Dibromoethane	<0.20		0.20	ug/L		15-APR-20	R5056729
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
1,1-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,2-Dichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Dichloromethane	<2.0		2.0	ug/L		15-APR-20	R5056729
1,2-Dichloropropane	<0.50		0.50	ug/L		15-APR-20	R5056729
cis-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729
trans-1,3-Dichloropropene	<0.50		0.50	ug/L		15-APR-20	R5056729
Ethylbenzene	<0.50		0.50	ug/L		15-APR-20	R5056729
n-Hexane	<0.50		0.50	ug/L		15-APR-20	R5056729
Methyl Ethyl Ketone	<20		20	ug/L		15-APR-20	R5056729
Methyl Isobutyl Ketone	<20		20	ug/L		15-APR-20	R5056729
MTBE	<0.50		0.50	ug/L		15-APR-20	R5056729
Styrene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Tetrachloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Toluene	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichloroethylene	<0.50		0.50	ug/L		15-APR-20	R5056729
Trichlorofluoromethane	<1.0		1.0	ug/L		15-APR-20	R5056729
Vinyl chloride	<0.50		0.50	ug/L		15-APR-20	R5056729

* 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
L2436395-3 EAST STORM WATER POND							
Sampled By: CLIENT on 13-APR-20 @ 10:00							
Matrix: WATER							
Volatile Organic Compounds							
o-Xylene	<0.50		0.50	ug/L		15-APR-20	R5056729
m+p-Xylenes	<1.0		1.0	ug/L		15-APR-20	R5056729
Xylenes (Total)	<1.1		1.1	ug/L		15-APR-20	
Surrogate: 4-Bromofluorobenzene	95.0		70-130	%		15-APR-20	R5056729
Surrogate: 1,4-Difluorobenzene	100.8		70-130	%		15-APR-20	R5056729
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-APR-20	
Acid Extractables							
2,3,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057433
Surrogate: 2,4,6-Tribromophenol	127.0		40-150	%	15-APR-20	17-APR-20	R5057433
Semi-Volatile Organics							
Acenaphthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Acenaphthylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(a)pyrene	<0.050		0.050	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(b)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(ghi)perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Benzo(k)fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
4-Chloroaniline	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Bis(2-chloroethyl)ether	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2-Chlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Chrysene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dibenzo(a,h)anthracene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1,2-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,3-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
1,4-Dichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
3,3'-Dichlorobenzidine	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dichlorophenol	<0.30		0.30	ug/L	15-APR-20	17-APR-20	R5057493
Diethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Dimethylphthalate	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dimethylphenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrophenol	<1.0		1.0	ug/L	15-APR-20	17-APR-20	R5057493
2,4-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,6-Dinitrotoluene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Bis(2-ethylhexyl)phthalate	<2.0		2.0	ug/L	15-APR-20	17-APR-20	R5057493
Fluoranthene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Fluorene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobenzene	<0.040		0.040	ug/L	15-APR-20	17-APR-20	R5057493
Hexachlorobutadiene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Indeno(1,2,3-cd)pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
1-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493

* 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
L2436395-3 EAST STORM WATER POND Sampled By: CLIENT on 13-APR-20 @ 10:00 Matrix: WATER							
Semi-Volatile Organics							
2-Methylnaphthalene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
Naphthalene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pentachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Perylene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Phenanthrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
Pyrene	<0.20		0.20	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,5-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,3,4,6-Tetrachlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
1,2,4-Trichlorobenzene	<0.40		0.40	ug/L	15-APR-20	17-APR-20	R5057493
2,4,5-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
2,4,6-Trichlorophenol	<0.50		0.50	ug/L	15-APR-20	17-APR-20	R5057493
Surrogate: 2-Fluorobiphenyl	99.1		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: Nitrobenzene d5	104.2		40-130	%	15-APR-20	17-APR-20	R5057493
Surrogate: p-Terphenyl d14	102.8		40-130	%	15-APR-20	17-APR-20	R5057493
Report Remarks : raised Cd LOR to remove potential Mo interference							

* 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)
Laboratory Control Sample	1,2,4-Trichlorobenzene	LCS-ND	L2436395-1, -2, -3
Laboratory Control Sample	1,3-Dichlorobenzene	LCS-ND	L2436395-1, -2, -3
Laboratory Control Sample	Hexachlorobutadiene	LCS-ND	L2436395-1, -2, -3
Matrix Spike	Aluminum (Al)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Barium (Ba)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Boron (B)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Calcium (Ca)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Iron (Fe)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Manganese (Mn)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Molybdenum (Mo)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Potassium (K)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Silicon (Si)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Sodium (Na)-Total	MS-B	L2436395-1, -2, -3
Matrix Spike	Strontium (Sr)-Total	MS-B	L2436395-1, -2, -3

Sample Parameter Qualifier key listed:

Qualifier	Description
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
HTC	Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable).
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
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**
625-ACID-EXTRA-WT	Water	EPA 8270 Acid Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD.			
625-WT	Water	EPA 8270 Extractables	SW846 8270
Aqueous samples are extracted and extracts are analyzed on GC/MSD. Depending on the analytical GC/MS column used benzo(j)fluoranthene may chromatographically co-elute with benzo(b)fluoranthene or benzo(k)fluoranthene.			
N-nitrosodiphenylamine is reported as diphenylamine. N-nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be separated from diphenylamine. (EPA 8270D)			
ALK-WT	Water	Alkalinity, Total (as CaCO ₃)	APHA 2320B
This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint.			
BR-IC-N-WT	Water	Bromide in Water by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
CL-IC-N-WT	Water	Chloride by IC	EPA 300.1 (mod)
Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.			
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).			
CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2
Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.			
When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference			
COD-T-WT	Water	Chemical Oxygen Demand	APHA 5220 D

Reference Information

This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method.

CR-CR6-IC-WT Water Chromium +6 EPA 7199

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. 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).

DOC-WT Water Dissolved Organic Carbon APHA 5310B

Sample is filtered through a 0.45um filter, then injected into a heated reaction chamber which is packed with an oxidative catalyst. The water is vaporized and the organic carbon is oxidized to carbon dioxide. The carbon dioxide is transported in a carrier gas and is measured by a non-dispersive infrared detector.

EC-SCREEN-WT Water Conductivity Screen (Internal Use Only) APHA 2510

Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc.

EC-WT Water Conductivity APHA 2510 B

Water samples can be measured directly by immersing the conductivity cell into the sample.

ETL-NH3-UNION-CLI-WT Water Un-ionized ammonia CALCULATION

F-IC-N-WT Water Fluoride in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-WT Water Hardness APHA 2340 B

Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO₃ equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation.

HG-T-CVAA-WT Water Total Mercury in Water by CVAAS EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.

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

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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).

NH3-F-WT Water Ammonia in Water by Fluorescence J. ENVIRON. MONIT., 2005, 7, 37-42, RSC

This analysis is carried out, on sulfuric acid preserved samples, using procedures modified from J. Environ. Monit., 2005, 7, 37 - 42, The Royal Society of Chemistry, "Flow-injection analysis with fluorescence detection for the determination of trace levels of ammonium in seawater", Roslyn J. Waston et al.

NO2-IC-WT Water Nitrite in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-WT Water Nitrate in Water by IC EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-WT Water Total P in Water by Colour APHA 4500-P PHOSPHORUS

This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample.

PH,TEMP-CLIENT-WT Water pH & Temperature Results supplied by client

PH-WT Water pH APHA 4500 H-Electrode

Water samples are analyzed directly by a calibrated pH meter.

Reference Information

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). Holdtime for samples under this regulation is 28 days

PHENOLS-4AAP-WT	Water	Phenol (4AAP)	EPA 9066
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An automated method is used to distill the sample. The distillate is then buffered to pH 9.4 which reacts with 4AAP and potassium ferricyanide to form a red complex which is measured colorimetrically.

SO4-IC-N-WT	Water	Sulfate in Water by IC	EPA 300.1 (mod)
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Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

SOLIDS-TDS-WT	Water	Total Dissolved Solids	APHA 2540C
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This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius.

SOLIDS-TSS-WT	Water	Suspended solids	APHA 2540 D-Gravimetric
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A well-mixed sample is filtered through a weighed standard glass fibre filter and the residue retained is dried in an oven at 104–1°C for a minimum of four hours or until a constant weight is achieved.

THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
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Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.

TKN-WT	Water	Total Kjeldahl Nitrogen	APHA 4500-Norg D
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This analysis is carried out using procedures adapted from APHA Method 4500-Norg "Nitrogen (Organic)". Total Kjeldahl Nitrogen is determined by sample digestion at 380 Celsius with analysis using an automated colorimetric method.

VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
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Aqueous samples are analyzed by headspace-GC/MS.

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

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: L2436395

Report Date: 22-APR-20

Page 1 of 18

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-ACID-EXTRA-WT	Water							
Batch	R5057433							
WG3307878-2	LCS							
2,3,6-Trichlorophenol			104.4		%		50-130	16-APR-20
WG3307878-1	MB							
2,3,6-Trichlorophenol			<0.20		ug/L		0.2	16-APR-20
Surrogate: 2,4,6-Tribromophenol			111.6		%		40-150	16-APR-20
625-WT	Water							
Batch	R5057493							
WG3307878-2	LCS							
1-Methylnaphthalene			57.2		%		50-140	17-APR-20
1,2-Dichlorobenzene			45.5		%		40-130	17-APR-20
1,2,4-Trichlorobenzene			42.5	LCS-ND	%		50-130	17-APR-20
1,3-Dichlorobenzene			40.6	LCS-ND	%		50-140	17-APR-20
1,4-Dichlorobenzene			44.4		%		40-130	17-APR-20
2-Chlorophenol			84.7		%		65-130	17-APR-20
2-Methylnaphthalene			54.9		%		50-140	17-APR-20
2,3,4,5-Tetrachlorophenol			102.6		%		50-130	17-APR-20
2,3,4,6-Tetrachlorophenol			99.4		%		65-130	17-APR-20
2,4-Dichlorophenol			98.7		%		65-130	17-APR-20
2,4-Dimethylphenol			90.5		%		30-130	17-APR-20
2,4-Dinitrophenol			139.5		%		40-140	17-APR-20
2,4-Dinitrotoluene			132.3		%		50-140	17-APR-20
2,4,5-Trichlorophenol			103.9		%		65-130	17-APR-20
2,4,6-Trichlorophenol			101.2		%		65-130	17-APR-20
2,6-Dinitrotoluene			112.9		%		50-140	17-APR-20
3,3'-Dichlorobenzidine			91.9		%		50-140	17-APR-20
4-Chloroaniline			60.8		%		30-140	17-APR-20
Acenaphthene			68.7		%		50-140	17-APR-20
Acenaphthylene			66.1		%		50-140	17-APR-20
Anthracene			102.6		%		50-140	17-APR-20
Benzo(a)anthracene			113.3		%		50-140	17-APR-20
Benzo(a)pyrene			106.1		%		60-130	17-APR-20
Benzo(b)fluoranthene			94.0		%		50-140	17-APR-20
Benzo(ghi)perylene			101.5		%		50-140	17-APR-20
Benzo(k)fluoranthene			121.8		%		50-140	17-APR-20
Bis(2-chloroethyl)ether			97.0		%		50-140	17-APR-20



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
625-WT	Water							
Batch	R5057493							
WG3307878-2	LCS							
Bis(2-ethylhexyl)phthalate			107.5		%		50-140	17-APR-20
Chrysene			108.3		%		50-140	17-APR-20
Dibenzo(a,h)anthracene			100.7		%		50-140	17-APR-20
Diethylphthalate			99.0		%		50-140	17-APR-20
Dimethylphthalate			100.9		%		50-140	17-APR-20
Fluoranthene			113.7		%		50-140	17-APR-20
Fluorene			79.2		%		50-140	17-APR-20
Hexachlorobenzene			78.8		%		40-130	17-APR-20
Hexachlorobutadiene			36.9	LCS-ND	%		40-130	17-APR-20
Indeno(1,2,3-cd)pyrene			101.5		%		50-140	17-APR-20
Naphthalene			56.5		%		50-140	17-APR-20
Pentachlorophenol			117.9		%		60-130	17-APR-20
Perylene			82.6		%		50-140	17-APR-20
Phenanthrene			96.1		%		50-140	17-APR-20
Pyrene			105.3		%		50-140	17-APR-20
WG3307878-1	MB							
1-Methylnaphthalene			<0.40		ug/L		0.4	17-APR-20
1,2-Dichlorobenzene			<0.40		ug/L		0.4	17-APR-20
1,2,4-Trichlorobenzene			<0.40		ug/L		0.4	17-APR-20
1,3-Dichlorobenzene			<0.40		ug/L		0.4	17-APR-20
1,4-Dichlorobenzene			<0.40		ug/L		0.4	17-APR-20
2-Chlorophenol			<0.30		ug/L		0.3	17-APR-20
2-Methylnaphthalene			<0.40		ug/L		0.4	17-APR-20
2,3,4,5-Tetrachlorophenol			<0.50		ug/L		0.5	17-APR-20
2,3,4,6-Tetrachlorophenol			<0.50		ug/L		0.5	17-APR-20
2,4-Dichlorophenol			<0.30		ug/L		0.3	17-APR-20
2,4-Dimethylphenol			<0.50		ug/L		0.5	17-APR-20
2,4-Dinitrophenol			<1.0		ug/L		1	17-APR-20
2,4-Dinitrotoluene			<0.40		ug/L		0.4	17-APR-20
2,4,5-Trichlorophenol			<0.50		ug/L		0.5	17-APR-20
2,4,6-Trichlorophenol			<0.50		ug/L		0.5	17-APR-20
2,6-Dinitrotoluene			<0.40		ug/L		0.4	17-APR-20
3,3'-Dichlorobenzidine			<0.40		ug/L		0.4	17-APR-20
4-Chloroaniline			<0.40		ug/L		0.4	17-APR-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-WT	Water							
Batch	R5057403							
WG3307952-1 MB								
Alkalinity, Total (as CaCO3)			<10		mg/L		10	15-APR-20
BR-IC-N-WT	Water							
Batch	R5057532							
WG3308360-14 DUP		WG3308360-13						
Bromide (Br)		<0.10	<0.10	RPD-NA	mg/L	N/A	20	15-APR-20
WG3308360-12 LCS			99.8		%		85-115	15-APR-20
Bromide (Br)								
WG3308360-11 MB			<0.10		mg/L		0.1	15-APR-20
Bromide (Br)								
WG3308360-15 MS		WG3308360-13	100.3		%		75-125	15-APR-20
Bromide (Br)								
CL-IC-N-WT	Water							
Batch	R5057532							
WG3308360-14 DUP		WG3308360-13						
Chloride (Cl)		20.5	20.5		mg/L	0.1	20	15-APR-20
WG3308360-12 LCS			102.6		%		90-110	15-APR-20
Chloride (Cl)								
WG3308360-11 MB			<0.50		mg/L		0.5	15-APR-20
Chloride (Cl)								
WG3308360-15 MS		WG3308360-13	98.6		%		75-125	15-APR-20
Chloride (Cl)								
CN-TOT-WT	Water							
Batch	R5056867							
WG3307288-8 DUP		L2435742-1						
Cyanide, Total		0.083	0.076		mg/L	8.9	20	15-APR-20
WG3307288-6 LCS			91.5		%		80-120	14-APR-20
Cyanide, Total								
WG3307288-5 MB			<0.0020		mg/L		0.002	14-APR-20
Cyanide, Total								
WG3307288-7 MS		L2435742-1	89		%		70-130	15-APR-20
Cyanide, Total								
COD-T-WT	Water							



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 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
COD-T-WT								
	Water							
Batch	R5058626							
WG3310081-3	DUP	L2436395-1						
COD		25	28		mg/L	9.1	20	20-APR-20
WG3310081-2	LCS		104.4		%		85-115	20-APR-20
COD								
WG3310081-1	MB		<10		mg/L		10	20-APR-20
COD								
WG3310081-4	MS	L2436395-1	99.4		%		75-125	20-APR-20
COD								
CR-CR6-IC-WT								
	Water							
Batch	R5057209							
WG3308031-4	DUP	WG3308031-3						
Chromium, Hexavalent		0.00057	<0.00050	RPD-NA	mg/L	N/A	20	15-APR-20
WG3308031-2	LCS		104.2		%		80-120	15-APR-20
Chromium, Hexavalent								
WG3308031-1	MB		<0.00050		mg/L		0.0005	15-APR-20
Chromium, Hexavalent								
WG3308031-5	MS	WG3308031-3	95.9		%		70-130	15-APR-20
Chromium, Hexavalent								
DOC-WT								
	Water							
Batch	R5057388							
WG3308014-7	DUP	L2436410-1						
Dissolved Organic Carbon		8.75	9.07		mg/L	3.6	20	16-APR-20
WG3308014-6	LCS		103.3		%		80-120	16-APR-20
Dissolved Organic Carbon								
WG3308014-5	MB		<0.50		mg/L		0.5	16-APR-20
Dissolved Organic Carbon								
WG3308014-8	MS	L2436410-1	103.1		%		70-130	16-APR-20
Dissolved Organic Carbon								
EC-WT								
	Water							
Batch	R5057403							
WG3307952-4	DUP	WG3307952-3						
Conductivity		737	746		umhos/cm	1.2	10	15-APR-20
WG3307952-2	LCS		97.1		%		90-110	15-APR-20
Conductivity								
WG3307952-1	MB		<3.0		umhos/cm		3	15-APR-20
Conductivity								
F-IC-N-WT								
	Water							



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 455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-WT		Water						
Batch	R5057532							
WG3308360-14	DUP	WG3308360-13						
Fluoride (F)		0.068	0.068		mg/L	0.3	20	15-APR-20
WG3308360-12	LCS							
Fluoride (F)			102.9		%		90-110	15-APR-20
WG3308360-11	MB							
Fluoride (F)			<0.020		mg/L		0.02	15-APR-20
WG3308360-15	MS	WG3308360-13						
Fluoride (F)			99.3		%		75-125	15-APR-20
HG-T-CVAA-WT		Water						
Batch	R5057094							
WG3307779-4	DUP	WG3307779-3						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	15-APR-20
WG3307779-2	LCS							
Mercury (Hg)-Total			104.0		%		80-120	15-APR-20
WG3307779-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	15-APR-20
WG3307779-6	MS	WG3307779-5						
Mercury (Hg)-Total			94.9		%		70-130	15-APR-20
MET-T-CCMS-WT		Water						
Batch	R5056853							
WG3307824-4	DUP	WG3307824-3						
Aluminum (Al)-Total		0.154	0.164		mg/L	6.6	20	15-APR-20
Antimony (Sb)-Total		0.00040	0.00041		mg/L	2.2	20	15-APR-20
Arsenic (As)-Total		0.00151	0.00156		mg/L	3.1	20	15-APR-20
Barium (Ba)-Total		0.0593	0.0594		mg/L	0.1	20	15-APR-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	15-APR-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	15-APR-20
Boron (B)-Total		0.180	0.185		mg/L	3.0	20	15-APR-20
Cadmium (Cd)-Total		0.0000719	0.0000744		mg/L	3.4	20	15-APR-20
Calcium (Ca)-Total		74.9	76.4		mg/L	1.9	20	15-APR-20
Cobalt (Co)-Total		0.00035	0.00035		mg/L	1.4	20	15-APR-20
Copper (Cu)-Total		0.00145	0.00148		mg/L	1.9	20	15-APR-20
Iron (Fe)-Total		0.160	0.163		mg/L	2.3	20	15-APR-20
Lead (Pb)-Total		0.000224	0.000227		mg/L	1.6	20	15-APR-20
Magnesium (Mg)-Total		22.5	22.6		mg/L	0.5	20	15-APR-20
Manganese (Mn)-Total		0.113	0.113		mg/L	0.3	20	15-APR-20



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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT		Water						
Batch	R5056853							
WG3307824-4	DUP	WG3307824-3						
Molybdenum (Mo)-Total		0.0659	0.0654		mg/L	0.7	20	15-APR-20
Nickel (Ni)-Total		0.00396	0.00408		mg/L	2.9	20	15-APR-20
Potassium (K)-Total		18.1	18.2		mg/L	0.9	20	15-APR-20
Selenium (Se)-Total		0.00119	0.00116		mg/L	2.5	20	15-APR-20
Silicon (Si)-Total		1.09	1.11		mg/L	1.8	20	15-APR-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	15-APR-20
Sodium (Na)-Total		43.5	43.2		mg/L	0.7	20	15-APR-20
Strontium (Sr)-Total		0.580	0.579		mg/L	0.2	20	15-APR-20
Thallium (Tl)-Total		0.000099	0.000095		mg/L	4.6	20	15-APR-20
Tin (Sn)-Total		0.00016	0.00015		mg/L	4.1	20	15-APR-20
Vanadium (V)-Total		0.00058	0.00061		mg/L	6.1	20	15-APR-20
Zinc (Zn)-Total		<0.0030	<0.0030	RPD-NA	mg/L	N/A	20	15-APR-20
WG3307824-2	LCS							
Aluminum (Al)-Total			102.7		%		80-120	15-APR-20
Antimony (Sb)-Total			97.8		%		80-120	15-APR-20
Arsenic (As)-Total			97.0		%		80-120	15-APR-20
Barium (Ba)-Total			98.5		%		80-120	15-APR-20
Beryllium (Be)-Total			103.8		%		80-120	15-APR-20
Bismuth (Bi)-Total			101.5		%		80-120	15-APR-20
Boron (B)-Total			100.6		%		80-120	15-APR-20
Cadmium (Cd)-Total			98.6		%		80-120	15-APR-20
Calcium (Ca)-Total			102.5		%		80-120	15-APR-20
Cobalt (Co)-Total			93.6		%		80-120	15-APR-20
Copper (Cu)-Total			95.6		%		80-120	15-APR-20
Iron (Fe)-Total			98.4		%		80-120	15-APR-20
Lead (Pb)-Total			101.9		%		80-120	15-APR-20
Magnesium (Mg)-Total			103.8		%		80-120	15-APR-20
Manganese (Mn)-Total			98.4		%		80-120	15-APR-20
Molybdenum (Mo)-Total			95.2		%		80-120	15-APR-20
Nickel (Ni)-Total			96.3		%		80-120	15-APR-20
Potassium (K)-Total			100.4		%		80-120	15-APR-20
Selenium (Se)-Total			96.9		%		80-120	15-APR-20
Silicon (Si)-Total			96.6		%		60-140	15-APR-20



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5056853							
WG3307824-2	LCS							
Silver (Ag)-Total			99.2		%		80-120	15-APR-20
Sodium (Na)-Total			98.6		%		80-120	15-APR-20
Strontium (Sr)-Total			102.7		%		80-120	15-APR-20
Thallium (Tl)-Total			102.4		%		80-120	15-APR-20
Tin (Sn)-Total			99.7		%		80-120	15-APR-20
Vanadium (V)-Total			98.7		%		80-120	15-APR-20
Zinc (Zn)-Total			109.5		%		80-120	15-APR-20
WG3307824-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	15-APR-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	15-APR-20
Arsenic (As)-Total			<0.00010		mg/L		0.0001	15-APR-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	15-APR-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	15-APR-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	15-APR-20
Boron (B)-Total			<0.010		mg/L		0.01	15-APR-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	15-APR-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	15-APR-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	15-APR-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	15-APR-20
Iron (Fe)-Total			<0.010		mg/L		0.01	15-APR-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	15-APR-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	15-APR-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	15-APR-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	15-APR-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	15-APR-20
Potassium (K)-Total			<0.050		mg/L		0.05	15-APR-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	15-APR-20
Silicon (Si)-Total			<0.10		mg/L		0.1	15-APR-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	15-APR-20
Sodium (Na)-Total			<0.050		mg/L		0.05	15-APR-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	15-APR-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	15-APR-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	15-APR-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	15-APR-20



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 455 PHILLIP STREET
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Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-F-WT								
Water								
Batch R5057374								
WG3307553-1 MB								
Ammonia, Total (as N)			<0.010		mg/L		0.01	16-APR-20
NO2-IC-WT								
Water								
Batch R5057532								
WG3308360-14 DUP		WG3308360-13						
Nitrite (as N)		<0.010	<0.010	RPD-NA	mg/L	N/A	20	15-APR-20
WG3308360-12 LCS								
Nitrite (as N)			102.0		%		90-110	15-APR-20
WG3308360-11 MB								
Nitrite (as N)			<0.010		mg/L		0.01	15-APR-20
WG3308360-15 MS		WG3308360-13						
Nitrite (as N)			99.2		%		75-125	15-APR-20
NO3-IC-WT								
Water								
Batch R5057532								
WG3308360-14 DUP		WG3308360-13						
Nitrate (as N)		<0.020	<0.020	RPD-NA	mg/L	N/A	20	15-APR-20
WG3308360-12 LCS								
Nitrate (as N)			102.1		%		90-110	15-APR-20
WG3308360-11 MB								
Nitrate (as N)			<0.020		mg/L		0.02	15-APR-20
WG3308360-15 MS		WG3308360-13						
Nitrate (as N)			97.1		%		75-125	15-APR-20
P-T-COL-WT								
Water								
Batch R5056908								
WG3307548-3 DUP		WG3307548-5						
Phosphorus, Total		0.0150	0.0139		mg/L	8.0	20	15-APR-20
WG3307548-2 LCS								
Phosphorus, Total			101.6		%		80-120	15-APR-20
WG3307548-1 MB								
Phosphorus, Total			<0.0030		mg/L		0.003	15-APR-20
WG3307548-4 MS		WG3307548-5						
Phosphorus, Total			97.7		%		70-130	15-APR-20
PH-WT								
Water								



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455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
PH-WT								
	Water							
Batch	R5057403							
WG3307952-4	DUP	WG3307952-3						
pH		8.28	8.26	J	pH units	0.02	0.2	15-APR-20
WG3307952-2	LCS							
pH			6.96		pH units		6.9-7.1	15-APR-20
PHENOLS-4AAP-WT								
	Water							
Batch	R5056996							
WG3307532-3	DUP	L2436233-1						
Phenols (4AAP)		<0.0010	<0.0010	RPD-NA	mg/L	N/A	20	14-APR-20
WG3307532-2	LCS							
Phenols (4AAP)			99.1		%		85-115	14-APR-20
WG3307532-1	MB							
Phenols (4AAP)			<0.0010		mg/L		0.001	14-APR-20
WG3307532-4	MS	L2436233-1						
Phenols (4AAP)			94.7		%		75-125	14-APR-20
SO4-IC-N-WT								
	Water							
Batch	R5057532							
WG3308360-14	DUP	WG3308360-13						
Sulfate (SO4)		3.83	3.83		mg/L	0.0	20	15-APR-20
WG3308360-12	LCS							
Sulfate (SO4)			103.8		%		90-110	15-APR-20
WG3308360-11	MB							
Sulfate (SO4)			<0.30		mg/L		0.3	15-APR-20
WG3308360-15	MS	WG3308360-13						
Sulfate (SO4)			100.9		%		75-125	15-APR-20
SOLIDS-TDS-WT								
	Water							
Batch	R5057880							
WG3308790-3	DUP	L2435959-3						
Total Dissolved Solids		442	442		mg/L	0.1	20	16-APR-20
WG3308790-2	LCS							
Total Dissolved Solids			97.7		%		85-115	16-APR-20
WG3308790-1	MB							
Total Dissolved Solids			<10		mg/L		10	16-APR-20
SOLIDS-TSS-WT								
	Water							
Batch	R5058422							
WG3309136-3	DUP	L2437464-3						
Total Suspended Solids		970	1030		mg/L	6.0	20	20-APR-20
WG3309136-2	LCS							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SOLIDS-TSS-WT		Water						
Batch	R5058422							
WG3309136-2 LCS								
Total Suspended Solids			100.1		%		85-115	20-APR-20
WG3309136-1 MB								
Total Suspended Solids			<2.0		mg/L		2	20-APR-20
TKN-WT		Water						
Batch	R5057049							
WG3307550-3 DUP		WG3307550-6						
Total Kjeldahl Nitrogen		0.93	0.90		mg/L	3.2	20	15-APR-20
Total Kjeldahl Nitrogen		0.93	0.90		mg/L	3.2	20	15-APR-20
WG3307550-2 LCS								
Total Kjeldahl Nitrogen			105.8		%		75-125	15-APR-20
WG3307550-1 MB								
Total Kjeldahl Nitrogen			<0.15		mg/L		0.15	15-APR-20
WG3307550-4 MS		WG3307550-6						
Total Kjeldahl Nitrogen			107.4		%		70-130	15-APR-20
VOC-ROU-HS-WT		Water						
Batch	R5056729							
WG3305549-4 DUP		WG3305549-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-APR-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	15-APR-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5056729							
WG3305549-4	DUP	WG3305549-3						
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-APR-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
cis-1,3-Dichloropropene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	15-APR-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-APR-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-APR-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-APR-20
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-APR-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-APR-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
Tetrachloroethylene		1.49	1.42		ug/L	20	30	16-APR-20
Toluene		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-APR-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
trans-1,3-Dichloropropene		<0.50	<0.30	RPD-NA	ug/L	N/A	30	15-APR-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-APR-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-APR-20
WG3305549-1	LCS							
1,1,1,2-Tetrachloroethane			93.5		%		70-130	15-APR-20
1,1,1,2-Tetrachloroethane			91.3		%		70-130	15-APR-20
1,1,1-Trichloroethane			99.7		%		70-130	15-APR-20
1,1,2-Trichloroethane			96.7		%		70-130	15-APR-20
1,2-Dibromoethane			96.4		%		70-130	15-APR-20
1,1-Dichloroethane			96.0		%		70-130	15-APR-20
1,1-Dichloroethylene			84.3		%		70-130	15-APR-20
1,2-Dichlorobenzene			98.9		%		70-130	15-APR-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5056729							
WG3305549-1	LCS							
1,2-Dichloroethane			95.1		%		70-130	15-APR-20
1,2-Dichloropropane			93.4		%		70-130	15-APR-20
1,3-Dichlorobenzene			98.9		%		70-130	15-APR-20
1,4-Dichlorobenzene			100.3		%		70-130	15-APR-20
Acetone			100.6		%		60-140	15-APR-20
Benzene			101.7		%		70-130	15-APR-20
Bromodichloromethane			97.9		%		70-130	15-APR-20
Bromoform			95.9		%		70-130	15-APR-20
Bromomethane			84.0		%		60-140	15-APR-20
Carbon tetrachloride			102.5		%		70-130	15-APR-20
Chlorobenzene			96.2		%		70-130	15-APR-20
Chloroethane			98.3		%		70-130	15-APR-20
Chloroform			102.2		%		70-130	15-APR-20
cis-1,2-Dichloroethylene			93.0		%		70-130	15-APR-20
cis-1,3-Dichloropropene			93.6		%		70-130	15-APR-20
Dibromochloromethane			94.1		%		70-130	15-APR-20
Dichlorodifluoromethane			87.0		%		50-140	15-APR-20
Dichloromethane			95.5		%		70-130	15-APR-20
Ethylbenzene			91.7		%		70-130	15-APR-20
m+p-Xylenes			93.3		%		70-130	15-APR-20
Methyl Ethyl Ketone			100.9		%		60-140	15-APR-20
Methyl Isobutyl Ketone			89.6		%		50-150	15-APR-20
n-Hexane			82.6		%		70-130	15-APR-20
MTBE			96.5		%		70-130	15-APR-20
o-Xylene			99.9		%		70-130	15-APR-20
Styrene			87.2		%		70-130	15-APR-20
Tetrachloroethylene			101.8		%		70-130	15-APR-20
Toluene			95.4		%		70-130	15-APR-20
trans-1,2-Dichloroethylene			88.6		%		70-130	15-APR-20
trans-1,3-Dichloropropene			94.2		%		70-130	15-APR-20
Trichloroethylene			101.2		%		70-130	15-APR-20
Trichlorofluoromethane			91.2		%		60-140	15-APR-20
Vinyl chloride			107.4		%		60-140	15-APR-20
WG3305549-2	MB							



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5056729							
WG3305549-2 MB								
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	15-APR-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	15-APR-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	15-APR-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	15-APR-20
1,2-Dibromoethane			<0.20		ug/L		0.2	15-APR-20
1,1-Dichloroethane			<0.50		ug/L		0.5	15-APR-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	15-APR-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	15-APR-20
1,2-Dichloroethane			<0.50		ug/L		0.5	15-APR-20
1,2-Dichloropropane			<0.50		ug/L		0.5	15-APR-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	15-APR-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	15-APR-20
Acetone			<20		ug/L		20	15-APR-20
Benzene			<0.50		ug/L		0.5	15-APR-20
Bromodichloromethane			<1.0		ug/L		1	15-APR-20
Bromoform			<1.0		ug/L		1	15-APR-20
Bromomethane			<0.50		ug/L		0.5	15-APR-20
Carbon tetrachloride			<0.20		ug/L		0.2	15-APR-20
Chlorobenzene			<0.50		ug/L		0.5	15-APR-20
Chloroethane			<1.0		ug/L		1	15-APR-20
Chloroform			<1.0		ug/L		1	15-APR-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-APR-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	15-APR-20
Dibromochloromethane			<1.0		ug/L		1	15-APR-20
Dichlorodifluoromethane			<1.0		ug/L		1	15-APR-20
Dichloromethane			<2.0		ug/L		2	15-APR-20
Ethylbenzene			<0.50		ug/L		0.5	15-APR-20
m+p-Xylenes			<0.40		ug/L		0.4	15-APR-20
Methyl Ethyl Ketone			<20		ug/L		20	15-APR-20
Methyl Isobutyl Ketone			<20		ug/L		20	15-APR-20
n-Hexane			<0.50		ug/L		0.5	15-APR-20
MTBE			<0.50		ug/L		0.5	15-APR-20
o-Xylene			<0.30		ug/L		0.3	15-APR-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5056729							
WG3305549-2	MB							
Styrene			<0.50		ug/L		0.5	15-APR-20
Tetrachloroethylene			<0.50		ug/L		0.5	15-APR-20
Toluene			<0.40		ug/L		0.4	15-APR-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-APR-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	15-APR-20
Trichloroethylene			<0.50		ug/L		0.5	15-APR-20
Trichlorofluoromethane			<1.0		ug/L		1	15-APR-20
Vinyl chloride			<0.50		ug/L		0.5	15-APR-20
Surrogate: 1,4-Difluorobenzene			100.6		%		70-130	15-APR-20
Surrogate: 4-Bromofluorobenzene			97.8		%		70-130	15-APR-20
WG3305549-5	MS	WG3305549-3						
1,1,1,2-Tetrachloroethane			91.0		%		50-150	15-APR-20
1,1,2,2-Tetrachloroethane			79.4		%		50-150	15-APR-20
1,1,1-Trichloroethane			102.7		%		50-150	15-APR-20
1,1,2-Trichloroethane			86.2		%		50-150	15-APR-20
1,2-Dibromoethane			83.7		%		50-150	15-APR-20
1,1-Dichloroethane			92.4		%		50-150	15-APR-20
1,1-Dichloroethylene			87.6		%		50-150	15-APR-20
1,2-Dichlorobenzene			98.7		%		50-150	15-APR-20
1,2-Dichloroethane			84.1		%		50-150	15-APR-20
1,2-Dichloropropane			88.5		%		50-150	15-APR-20
1,3-Dichlorobenzene			103.2		%		50-150	15-APR-20
1,4-Dichlorobenzene			104.0		%		50-150	15-APR-20
Acetone			85.4		%		50-150	15-APR-20
Benzene			100.7		%		50-150	15-APR-20
Bromodichloromethane			92.6		%		50-150	15-APR-20
Bromoform			85.0		%		50-150	15-APR-20
Bromomethane			81.4		%		50-150	15-APR-20
Carbon tetrachloride			107.4		%		50-150	15-APR-20
Chlorobenzene			95.7		%		50-150	15-APR-20
Chloroethane			99.1		%		50-150	15-APR-20
Chloroform			99.96		%		50-150	15-APR-20
cis-1,2-Dichloroethylene			89.7		%		50-150	15-APR-20
cis-1,3-Dichloropropene			86.9		%		50-150	15-APR-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5056729							
WG3305549-5 MS		WG3305549-3						
Dibromochloromethane			85.9		%		50-150	15-APR-20
Dichlorodifluoromethane			92.8		%		50-150	15-APR-20
Dichloromethane			89.5		%		50-150	15-APR-20
Ethylbenzene			95.6		%		50-150	15-APR-20
m+p-Xylenes			97.8		%		50-150	15-APR-20
Methyl Ethyl Ketone			75.4		%		50-150	15-APR-20
Methyl Isobutyl Ketone			70.9		%		50-150	15-APR-20
n-Hexane			86.8		%		50-150	15-APR-20
MTBE			96.4		%		50-150	15-APR-20
o-Xylene			102.0		%		50-150	15-APR-20
Styrene			86.1		%		50-150	15-APR-20
Tetrachloroethylene			109.3		%		50-150	15-APR-20
Toluene			96.8		%		50-150	15-APR-20
trans-1,2-Dichloroethylene			91.5		%		50-150	15-APR-20
trans-1,3-Dichloropropene			84.6		%		50-150	15-APR-20
Trichloroethylene			104.8		%		50-150	15-APR-20
Trichlorofluoromethane			95.6		%		50-150	15-APR-20
Vinyl chloride			111.2		%		50-150	15-APR-20

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
J	Duplicate results and limits are expressed in terms of absolute difference.
LCS-ND	Lab Control Sample recovery was slightly outside ALS DQO. Reported non-detect results for associated samples were unaffected.
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.



Report To		Acct#13791		Report Format / Distribution		Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)											
Company: GHD LIMITED		Contact: Laura Ermeta		Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)		R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)											
Address: 455 Phillip St N2L 3X2		Phone: 519-884-0510		Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT											
Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Copy of Invoice with Report <input type="checkbox"/> Yes <input type="checkbox"/> No		Criteria on Report - provide details below if box checked		E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT											
Company: GHD LIMITED		Contact: Laura Ermeta		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX		E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge											
Project Information		ALS Quote #: 44985-20-19		Job #: 73506479		Specify Date Required for E2,E or P:											
ALS Lab Work Order # (lab use only) 12436395		ALS Contact: Rick H		Sampler:		Analysis Request											
Sample Identification and/or Coordinates (This description will appear on the report)		Date (dd-mmm-yy)		Time (hh:mm)		Sample Type		Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below									
EQ Pond Discharge		13-4-20		1100		Water		ALOK, Conductivity, pH, TDS, TSS, Phenols									
West Storm Water Pond		13-4-20		1030		Water		Br, NO2, NO3, SO4, Cl, F (ANIONS-IC-6-WT)									
East Storm Water Pond		13-4-20		1000		Water		DOC (DOC-WT), COD, TKN, TP									
								Total CN (CN-TOT-WT)									
								Un-ionized NH3 (NH3, ETL-NH3-UNION-CL)									
								Total Metals (MET-T, CCMSS-WT, WT-44985-Met)									
								Total Mercury (HG-T, CVA-A-WT)									
								Total Cr+6 (CR-CR6-IC-WT), Hardness calc									
								VOCs (VOC-ROU-HS-WT, WT-44985-VOC)									
								SVOCs (SVOC-44985-P-WT)									
								CLIENT SUPPLIED TEMPERATURE **									
								CLIENT SUPPLIED pH **									
								Number of Containers									
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report (client Use)		Frozen <input type="checkbox"/>		SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>		Ice packs Yes <input checked="" type="checkbox"/> No <input 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	
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		**Please fill in Client Supplied temperature and pH for Unionized NH3 calculation**		6.8		7/14/20		20							
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)		FINAL SHIPMENT RECEPTION (lab use only)		Released by: [Signature]		Date: 4/23/20		Time: 12:20		Received by: [Signature]		Date: 7/14/20		Time: 20	

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

USA-FM-02264-00 Form 04 January 2014

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: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 03-JUN-20
Report Date: 10-JUN-20 06:31 (MT)
Version: FINAL REV. 2

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2455359
Project P.O. #: 73506479
Job Reference: 44985
C of C Numbers:
Legal Site Desc:

Comments:

10-JUN-2020 Resent report to whole distribution list. No data change. RH.

Dana Brown, Chem. Tech. DIPL
Account Manager

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ADDRESS: 9450 17 Avenue NW, Edmonton, AB T6N 1M9 Canada | Phone: +1 780 413 5227 | Fax: +1 780 437 2311
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
MICROTOX-ORG-ED	Water	Microtox Original	ERCB Directive 050
<p>Light output of luminescent bacteria is measured after they have been challenged by a sample of unknown toxicity, and compared to the light output of a control reagent blank. The difference in light output is attributed to the effect of the sample on the organisms, and the degree of light loss indicates metabolic inhibition and the degree of toxicity of the sample to the bacteria. EC50(5) and EC50(15) values are reported, and refer to the effective concentration of the sample that caused a 50% decrease in the light output in 5 and 15 minutes.</p>			
MICROTOX-PHYSICAL-ED	Water	Microtox Physical Tests	ERCB Directive 050

** 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
ED	ALS ENVIRONMENTAL - EDMONTON, ALBERTA, 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.



Environmental

Quality Control Report

Workorder: L2455359

Report Date: 10-JUN-20

Page 1 of 2

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MICROTOX-ORG-ED								
	Water							
Batch	R5110062							
WG3335884-2 CRM		PHENOL_ED						
EC50 (5min) Original			15.3		mg/L		13-26	04-JUN-20
WG3335884-3 CRM		PHENOL_ED						
EC50 (5min) Original			15.9		mg/L		13-26	04-JUN-20
WG3335884-5 CRM		PHENOL_ED						
EC50 (5min) Original			17.2		mg/L		13-26	04-JUN-20
WG3335884-4 DUP		L2455359-1						
EC50 (15min) Original		>100	>100	RPD-NA	%	N/A		04-JUN-20
EC20 (15min) Original		>100	>100	RPD-NA	%	N/A		04-JUN-20
EC50 (5min) Original		>100	>100	RPD-NA	%	N/A		04-JUN-20
EC20 (5min) Original		>100	>100	RPD-NA	%	N/A		04-JUN-20
WG3335884-1 MB								
EC50 (15min) Original			PASS					04-JUN-20
EC20 (15min) Original			PASS					04-JUN-20
EC50 (5min) Original			PASS					04-JUN-20
EC20 (5min) Original			PASS					04-JUN-20

Quality Control Report

Workorder: L2455359

Report Date: 10-JUN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 2 of 2

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
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.

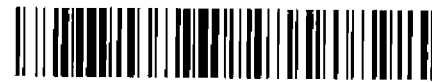
ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where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



Chain of Custody (COC) / Analytical Request Form



COC Number: 14 -

Canada Toll Free: 1 800 668 9878

L2455359-COFC

Page 1 of 1

www.alsglobal.com

Report To		Acct#13791		Report Format / Distribution			Select Service Level below (Rush Turnaround Time (TAT) is not available for all tests)												
Company: GHD LIMITED		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			R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)												
Contact: Jennifer Balkwill		Criteria on Report - provide details below if box checked		Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX			P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT												
Address: 651 Colby Drive, Waterloo, Ontario N2V 1C2		Email 1 or Fax Jennifer.Balkwill@ghd.com		Email 2 See PO			E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT												
Phone: 519-884-0510		Invoice To Same as Report To <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Invoice Distribution			E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge												
Copy of Invoice with Report <input type="checkbox"/> Yes <input type="checkbox"/> No		Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> FAX			Specify Date Required for E2,E or P:			Analysis Request											
Company: GHD LIMITED		Email 1 or Fax Jennifer.Balkwill@ghd.com			Email 2			Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below											
Contact: Jennifer Balkwill		Project Information			Oil and Gas Required Fields (client use)			MICROTOX (MICROTOX-ORG-ED)											
ALS Quote #: 44985		Approver ID:			Cost Center:			MICROTOX-PHYSICAL-ED											
Job #: 44985		GL Account:			Routing Code:														
PO / AFE: 73506479		Activity Code:			Location:														
LSD:		ALS Contact: L.Ermeta			Sampler:														
ALS Lab Work Order # (lab use only)		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		
		EQ Pond Discharge			01-06-20			08:15			Grab Water			R			2		
Drinking Water (DW) Samples ¹ (client use)		Special Instructions / Specify Criteria to add on report (client Use)			SAMPLE CONDITION AS RECEIVED (lab use only)			Frozen <input type="checkbox"/>			SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>								
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		Please send to ALS Edmonton ASAP for analysis (short HT)			Ice packs Yes <input type="checkbox"/> No <input type="checkbox"/>			Custody seal intact Yes <input type="checkbox"/> No <input type="checkbox"/>			Cooling Initiated <input type="checkbox"/>								
Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C			20.5								
SHIPMENT RELEASE (client use)		INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)														
Released by: R Tobin		Date: June 20		Time: 10:30		Received by: Rm		Date: 6/3/20		Time: 9:23		Received by:		Date:		Time:			

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS Form 0026 v09 Print 04 January 2014

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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 03-JUN-20
Report Date: 08-JUN-20 09:07 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2455512
Project P.O. #: 73506479
Job Reference: 44985-20-20
C of C Numbers:
Legal Site Desc:

Comments: ADDITIONAL 04-JUN-20 10:34

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
L2455512-1 EQ POND DISCHARGE Sampled By: CLIENT on 01-JUN-20 @ 08:15 Matrix: WATER							
Total Metals							
Aluminum (Al)-Total	0.240		0.010	mg/L	04-JUN-20	05-JUN-20	R5110485
Antimony (Sb)-Total	0.00041		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Arsenic (As)-Total	0.00158		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Barium (Ba)-Total	0.0659		0.00020	mg/L	04-JUN-20	05-JUN-20	R5110485
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Boron (B)-Total	0.177		0.010	mg/L	04-JUN-20	05-JUN-20	R5110485
Cadmium (Cd)-Total	<0.000080	DLM	0.000080	mg/L	04-JUN-20	05-JUN-20	R5110485
Calcium (Ca)-Total	97.2		0.50	mg/L	04-JUN-20	05-JUN-20	R5110485
Cobalt (Co)-Total	0.00057		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Copper (Cu)-Total	0.0018		0.0010	mg/L	04-JUN-20	05-JUN-20	R5110485
Iron (Fe)-Total	0.332		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Lead (Pb)-Total	0.00044		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Magnesium (Mg)-Total	33.7		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Manganese (Mn)-Total	0.0685		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Mercury (Hg)-Total	0.000050		0.000050	mg/L		05-JUN-20	R5109678
Molybdenum (Mo)-Total	0.0677		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Nickel (Ni)-Total	0.00612		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Potassium (K)-Total	17.7		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Selenium (Se)-Total	0.000943		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Silicon (Si)-Total	2.12		0.10	mg/L	04-JUN-20	05-JUN-20	R5110485
Silver (Ag)-Total	<0.000050		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Sodium (Na)-Total	63.9		0.50	mg/L	04-JUN-20	05-JUN-20	R5110485
Strontium (Sr)-Total	0.776		0.0010	mg/L	04-JUN-20	05-JUN-20	R5110485
Thallium (Tl)-Total	0.000122		0.000010	mg/L	04-JUN-20	05-JUN-20	R5110485
Tin (Sn)-Total	<0.00010		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Vanadium (V)-Total	0.00078		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Zinc (Zn)-Total	0.0043		0.0030	mg/L	04-JUN-20	05-JUN-20	R5110485
Report Remarks : DLM - Cd LOR increased due to potential interference from Mo							
L2455512-2 EAST STORM WATER POND Sampled By: CLIENT on 01-JUN-20 @ 08:30 Matrix: WATER							
Total Metals							
Aluminum (Al)-Total	1.11		0.010	mg/L	04-JUN-20	05-JUN-20	R5110485
Antimony (Sb)-Total	0.00050		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Arsenic (As)-Total	0.00270		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Barium (Ba)-Total	0.0699		0.00020	mg/L	04-JUN-20	05-JUN-20	R5110485
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Boron (B)-Total	0.157		0.010	mg/L	04-JUN-20	05-JUN-20	R5110485
Cadmium (Cd)-Total	<0.00030	DLM	0.00030	mg/L	04-JUN-20	05-JUN-20	R5110485
Calcium (Ca)-Total	109		0.50	mg/L	04-JUN-20	05-JUN-20	R5110485

* 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
L2455512-2 EAST STORM WATER POND							
Sampled By: CLIENT on 01-JUN-20 @ 08:30							
Matrix: WATER							
Total Metals							
Cobalt (Co)-Total	0.00178		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Copper (Cu)-Total	0.0030		0.0010	mg/L	04-JUN-20	05-JUN-20	R5110485
Iron (Fe)-Total	1.79		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Lead (Pb)-Total	0.00242		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Magnesium (Mg)-Total	36.4		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Manganese (Mn)-Total	0.274		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Mercury (Hg)-Total	0.0000327		0.0000050	mg/L		05-JUN-20	R5109678
Molybdenum (Mo)-Total	0.0743		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Nickel (Ni)-Total	0.00941		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Potassium (K)-Total	18.2		0.050	mg/L	04-JUN-20	05-JUN-20	R5110485
Selenium (Se)-Total	0.00109		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Silicon (Si)-Total	3.89		0.10	mg/L	04-JUN-20	05-JUN-20	R5110485
Silver (Ag)-Total	<0.000050		0.000050	mg/L	04-JUN-20	05-JUN-20	R5110485
Sodium (Na)-Total	70.1		0.50	mg/L	04-JUN-20	05-JUN-20	R5110485
Strontium (Sr)-Total	0.882		0.0010	mg/L	04-JUN-20	05-JUN-20	R5110485
Thallium (Tl)-Total	0.000127		0.000010	mg/L	04-JUN-20	05-JUN-20	R5110485
Tin (Sn)-Total	<0.00010		0.00010	mg/L	04-JUN-20	05-JUN-20	R5110485
Vanadium (V)-Total	0.00264		0.00050	mg/L	04-JUN-20	05-JUN-20	R5110485
Zinc (Zn)-Total	0.0130		0.0030	mg/L	04-JUN-20	05-JUN-20	R5110485
Report Remarks : DLM - Cd LOR increased due to potential interference from Mo							

* 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)-Total	MS-B	L2455512-1, -2
Matrix Spike	Calcium (Ca)-Total	MS-B	L2455512-1, -2
Matrix Spike	Magnesium (Mg)-Total	MS-B	L2455512-1, -2
Matrix Spike	Silicon (Si)-Total	MS-B	L2455512-1, -2
Matrix Spike	Sodium (Na)-Total	MS-B	L2455512-1, -2
Matrix Spike	Strontium (Sr)-Total	MS-B	L2455512-1, -2

Sample Parameter Qualifier key listed:

Qualifier	Description
DLM	Detection Limit Adjusted due to sample matrix effects (e.g. chemical interference, colour, turbidity).
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**
HG-T-CVAA-WT	Water	Total Mercury in Water by CVAAS	EPA 1631E (mod)
Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.			
MET-T-CCMS-WT	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

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 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:

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: L245512

Report Date: 08-JUN-20

Page 1 of 5

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-T-CVAA-WT								
	Water							
Batch	R5109678							
WG3335452-3	DUP	L2455740-1						
Mercury (Hg)-Total		<0.0000050	<0.0000050	RPD-NA	mg/L	N/A	20	05-JUN-20
WG3335452-2	LCS							
Mercury (Hg)-Total			107.0		%		80-120	05-JUN-20
WG3335452-1	MB							
Mercury (Hg)-Total			<0.0000050		mg/L		0.000005	05-JUN-20
WG3335452-4	MS	L2455740-2						
Mercury (Hg)-Total			111.8		%		70-130	05-JUN-20
MET-T-CCMS-WT								
	Water							
Batch	R5110485							
WG3335820-4	DUP	WG3335820-3						
Aluminum (Al)-Total		<0.0050	<0.0050	RPD-NA	mg/L	N/A	20	05-JUN-20
Antimony (Sb)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-JUN-20
Arsenic (As)-Total		0.00098	0.00099		mg/L	1.6	20	05-JUN-20
Barium (Ba)-Total		0.00925	0.00909		mg/L	1.8	20	05-JUN-20
Beryllium (Be)-Total		<0.00010	<0.00010	RPD-NA	mg/L	N/A	20	05-JUN-20
Bismuth (Bi)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-JUN-20
Boron (B)-Total		<0.010	<0.010	RPD-NA	mg/L	N/A	20	05-JUN-20
Cadmium (Cd)-Total		0.0000054	<0.0000050	RPD-NA	mg/L	N/A	20	05-JUN-20
Calcium (Ca)-Total		58.8	58.2		mg/L	1.1	20	05-JUN-20
Cobalt (Co)-Total		0.00020	0.00021		mg/L	4.6	20	05-JUN-20
Copper (Cu)-Total		0.00424	0.00426		mg/L	0.5	20	05-JUN-20
Iron (Fe)-Total		0.193	0.195		mg/L	1.0	20	05-JUN-20
Lead (Pb)-Total		0.000113	0.000104		mg/L	8.4	20	05-JUN-20
Magnesium (Mg)-Total		9.01	8.94		mg/L	0.8	20	05-JUN-20
Manganese (Mn)-Total		0.0464	0.0465		mg/L	0.1	20	05-JUN-20
Molybdenum (Mo)-Total		0.000162	0.000170		mg/L	5.0	20	05-JUN-20
Nickel (Ni)-Total		0.00089	0.00085		mg/L	5.4	20	05-JUN-20
Potassium (K)-Total		0.897	0.893		mg/L	0.4	20	05-JUN-20
Selenium (Se)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-JUN-20
Silicon (Si)-Total		3.81	3.87		mg/L	1.5	20	05-JUN-20
Silver (Ag)-Total		<0.000050	<0.000050	RPD-NA	mg/L	N/A	20	05-JUN-20
Sodium (Na)-Total		38.1	38.7		mg/L	1.7	20	05-JUN-20
Strontium (Sr)-Total		0.107	0.108		mg/L	1.3	20	05-JUN-20
Thallium (Tl)-Total		<0.000010	<0.000010	RPD-NA	mg/L	N/A	20	05-JUN-20



Quality Control Report

Workorder: L2455512

Report Date: 08-JUN-20

Page 2 of 5

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5110485							
WG3335820-4	DUP	WG3335820-3						
Tin (Sn)-Total		0.00018	0.00015		mg/L	20	20	05-JUN-20
Vanadium (V)-Total		<0.00050	<0.00050	RPD-NA	mg/L	N/A	20	05-JUN-20
Zinc (Zn)-Total		0.114	0.114		mg/L	0.2	20	05-JUN-20
WG3335820-2	LCS							
Aluminum (Al)-Total			103.7		%		80-120	05-JUN-20
Antimony (Sb)-Total			100.4		%		80-120	05-JUN-20
Arsenic (As)-Total			100.3		%		80-120	05-JUN-20
Barium (Ba)-Total			97.3		%		80-120	05-JUN-20
Beryllium (Be)-Total			98.9		%		80-120	05-JUN-20
Bismuth (Bi)-Total			97.4		%		80-120	05-JUN-20
Boron (B)-Total			99.8		%		80-120	05-JUN-20
Cadmium (Cd)-Total			102.3		%		80-120	05-JUN-20
Calcium (Ca)-Total			98.7		%		80-120	05-JUN-20
Cobalt (Co)-Total			100.9		%		80-120	05-JUN-20
Copper (Cu)-Total			100.9		%		80-120	05-JUN-20
Iron (Fe)-Total			97.7		%		80-120	05-JUN-20
Lead (Pb)-Total			100.3		%		80-120	05-JUN-20
Magnesium (Mg)-Total			108.2		%		80-120	05-JUN-20
Manganese (Mn)-Total			100.7		%		80-120	05-JUN-20
Molybdenum (Mo)-Total			94.4		%		80-120	05-JUN-20
Nickel (Ni)-Total			100.4		%		80-120	05-JUN-20
Potassium (K)-Total			99.3		%		80-120	05-JUN-20
Selenium (Se)-Total			101.6		%		80-120	05-JUN-20
Silicon (Si)-Total			99.0		%		60-140	05-JUN-20
Silver (Ag)-Total			98.0		%		80-120	05-JUN-20
Sodium (Na)-Total			104.7		%		80-120	05-JUN-20
Strontium (Sr)-Total			100.5		%		80-120	05-JUN-20
Thallium (Tl)-Total			99.5		%		80-120	05-JUN-20
Tin (Sn)-Total			95.1		%		80-120	05-JUN-20
Vanadium (V)-Total			101.9		%		80-120	05-JUN-20
Zinc (Zn)-Total			101.2		%		80-120	05-JUN-20
WG3335820-1	MB							
Aluminum (Al)-Total			<0.0050		mg/L		0.005	05-JUN-20
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	05-JUN-20



Quality Control Report

Workorder: L2455512

Report Date: 08-JUN-20

Page 3 of 5

Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2
 Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT								
	Water							
Batch	R5110485							
WG3335820-1	MB							
Arsenic (As)-Total			<0.00010		mg/L		0.0001	05-JUN-20
Barium (Ba)-Total			<0.00010		mg/L		0.0001	05-JUN-20
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	05-JUN-20
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	05-JUN-20
Boron (B)-Total			<0.010		mg/L		0.01	05-JUN-20
Cadmium (Cd)-Total			<0.0000050		mg/L		0.000005	05-JUN-20
Calcium (Ca)-Total			<0.050		mg/L		0.05	05-JUN-20
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	05-JUN-20
Copper (Cu)-Total			<0.00050		mg/L		0.0005	05-JUN-20
Iron (Fe)-Total			<0.010		mg/L		0.01	05-JUN-20
Lead (Pb)-Total			<0.000050		mg/L		0.00005	05-JUN-20
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	05-JUN-20
Manganese (Mn)-Total			<0.00050		mg/L		0.0005	05-JUN-20
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	05-JUN-20
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	05-JUN-20
Potassium (K)-Total			<0.050		mg/L		0.05	05-JUN-20
Selenium (Se)-Total			<0.000050		mg/L		0.00005	05-JUN-20
Silicon (Si)-Total			<0.10		mg/L		0.1	05-JUN-20
Silver (Ag)-Total			<0.000050		mg/L		0.00005	05-JUN-20
Sodium (Na)-Total			<0.050		mg/L		0.05	05-JUN-20
Strontium (Sr)-Total			<0.0010		mg/L		0.001	05-JUN-20
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	05-JUN-20
Tin (Sn)-Total			<0.00010		mg/L		0.0001	05-JUN-20
Vanadium (V)-Total			<0.00050		mg/L		0.0005	05-JUN-20
Zinc (Zn)-Total			<0.0030		mg/L		0.003	05-JUN-20
WG3335820-5	MS	WG3335820-6						
Aluminum (Al)-Total			101.3		%		70-130	05-JUN-20
Antimony (Sb)-Total			102.0		%		70-130	05-JUN-20
Arsenic (As)-Total			98.4		%		70-130	05-JUN-20
Barium (Ba)-Total			N/A	MS-B	%		-	05-JUN-20
Beryllium (Be)-Total			97.7		%		70-130	05-JUN-20
Bismuth (Bi)-Total			89.9		%		70-130	05-JUN-20
Boron (B)-Total			97.2		%		70-130	05-JUN-20
Cadmium (Cd)-Total			98.4		%		70-130	05-JUN-20



Quality Control Report

Workorder: L2455512

Report Date: 08-JUN-20

Page 4 of 5

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-WT	Water							
Batch	R5110485							
WG3335820-5 MS		WG3335820-6						
Calcium (Ca)-Total			N/A	MS-B	%		-	05-JUN-20
Cobalt (Co)-Total			96.2		%		70-130	05-JUN-20
Copper (Cu)-Total			91.3		%		70-130	05-JUN-20
Iron (Fe)-Total			88.2		%		70-130	05-JUN-20
Lead (Pb)-Total			89.9		%		70-130	05-JUN-20
Magnesium (Mg)-Total			N/A	MS-B	%		-	05-JUN-20
Manganese (Mn)-Total			93.2		%		70-130	05-JUN-20
Molybdenum (Mo)-Total			98.3		%		70-130	05-JUN-20
Nickel (Ni)-Total			94.2		%		70-130	05-JUN-20
Potassium (K)-Total			100.3		%		70-130	05-JUN-20
Selenium (Se)-Total			96.5		%		70-130	05-JUN-20
Silicon (Si)-Total			N/A	MS-B	%		-	05-JUN-20
Silver (Ag)-Total			92.5		%		70-130	05-JUN-20
Sodium (Na)-Total			N/A	MS-B	%		-	05-JUN-20
Strontium (Sr)-Total			N/A	MS-B	%		-	05-JUN-20
Thallium (Tl)-Total			90.8		%		70-130	05-JUN-20
Tin (Sn)-Total			93.5		%		70-130	05-JUN-20
Vanadium (V)-Total			102.8		%		70-130	05-JUN-20
Zinc (Zn)-Total			88.1		%		70-130	05-JUN-20

Quality Control Report

Workorder: L2455512

Report Date: 08-JUN-20

Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

Page 5 of 5

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.



Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878



L2455512-COFC

COC Number: 14 - *SA*

Page 1 of 1

www.alsglobal.com

Report To		Acct#13791		Report Format / Distribution				Select Service Level Below (Rush Turnaround Time (TAT) is not available for all tests)											
Company: GHD LIMITED				Select Report Format: <input checked="" type="checkbox"/> PDF <input checked="" type="checkbox"/> EXCEL <input checked="" type="checkbox"/> EDD (DIGITAL)				R <input checked="" type="checkbox"/> Regular (Standard TAT if received by 3 pm - business days)											
Contact: Laura Ermeta				Quality Control (QC) Report with Report <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No				P <input type="checkbox"/> Priority (2-4 bus. days if received by 3pm) 50% surcharge - contact ALS to confirm TAT											
Address: 455 Phillip St N2L 3X2				<input type="checkbox"/> Criteria on Report - provide details below if box checked				E <input type="checkbox"/> Emergency (1-2 bus. days if received by 3pm) 100% surcharge - contact ALS to confirm TAT											
Phone: 519-884-0510				Select Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input type="checkbox"/> FAX				E2 <input type="checkbox"/> Same day or weekend emergency - contact ALS to confirm TAT and surcharge											
				Email 1 or Fax laura.ermeta@ghd.com				Specify Date Required for E2,E or P:											
				Email 2 See PO				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 type="checkbox"/> No				Select Invoice Distribution: <input checked="" type="checkbox"/> EMAIL <input type="checkbox"/> MAIL <input checked="" type="checkbox"/> FAX															
Company: GHD LIMITED				Email 1 or Fax laura.ermeta@ghd.com															
Contact: Laura Ermeta				Email 2															
Project Information				Oil and Gas Required Fields (client use)															
ALS Quote #:				Approver ID:		Cost Center:													
Job #: 44985-20-19				GL Account:		Routing Code:													
PO / AFE: 73506479				Activity Code:															
LSD:				Location:															
ALS Lab Work Order # (lab use only) L2455512				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	ALK, Conductivity, pH, TDS, TSS, Phenols	Br, NO2, NO3, SO4, Cl, F (ANIONS-I-C-WT)	DOC (DOC-WT), COD, TKN, TP	Total CN (CN-TOT-WT)	Un-ionized NH3 (NH3.ETL-NH3-UNION-CL)	Total Metals (MET-T-COMSS-WT, WT-44985-Met)	Total Mercury (HG-T-CVAA-WT)	Total Cr 6+ (CR-CR6-I-C-WT), Hardness calc	VOCs (VOC-ROU-HS-WT, WT-44985-VOC)	SVOCs (SVOC-44985-P-WT)	CLIENT SUPPLIED TEMPERATURE **	CLIENT SUPPLIED pH **	Number of Containers
	EQ Pond Discharge			01/06/20	08:15	Water	R	R	R	R	R	R	R	R	R	R	15	7.94	
	West Storm Water Pond					Water	R	R	R	R	R	R	R	R	R	R			
	East Storm Water Pond			01/06/20	08:30	Water	R	R	R	R	R	R	R	R	R	R	12	7.26	
Drinking Water (DW) Samples¹ (client use)				Special Instructions / Specify Criteria to add on report (client Use)				SAMPLE CONDITION AS RECEIVED (lab use only)											
Are samples taken from a Regulated DW System? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No				**Please fill in Client Supplied temperature and pH for Unionized NH3 calculation**				Frozen <input type="checkbox"/> SIF Observations Yes <input type="checkbox"/> No <input type="checkbox"/>											
Are samples for human drinking water use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No								Ice packs Yes <input checked="" type="checkbox"/> No <input 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						
													20.8						
SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (lab use only)				FINAL SHIPMENT RECEPTION (lab use only)											
Released by: <i>R Tobin</i>		Date: <i>Jan 20/20</i>	Time: <i>11:15</i>	Received by:		Date:	Time:	Received by: <i>[Signature]</i>		Date: <i>6/3/20</i>	Time: <i>9:15</i>								

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

NA-FM-0326e v09 Front04 January 2014

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.



GHD Limited (Waterloo)
ATTN: LAURA ERMETA
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Date Received: 09-JUN-20
Report Date: 15-JUN-20 07:47 (MT)
Version: FINAL

Client Phone: 519-884-0510

Certificate of Analysis

Lab Work Order #: L2457851
Project P.O. #: 73512223-1
Job Reference: 44985-30-10
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
L2457851-1 WEST PROCESS POND							
Sampled By: CLIENT on 08-JUN-20 @ 12:30							
Matrix: WATER							
Volatile Organic Compounds							
Acetone	<20		20	ug/L		15-JUN-20	R5117447
Benzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Bromodichloromethane	<1.0		1.0	ug/L		15-JUN-20	R5117447
Bromoform	<1.0		1.0	ug/L		15-JUN-20	R5117447
Bromomethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
Carbon Disulfide	<1.0		1.0	ug/L		15-JUN-20	R5117447
Carbon tetrachloride	<0.20		0.20	ug/L		15-JUN-20	R5117447
Chlorobenzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Dibromochloromethane	<1.0		1.0	ug/L		15-JUN-20	R5117447
Chloroethane	<1.0		1.0	ug/L		15-JUN-20	R5117447
Chloroform	<1.0		1.0	ug/L		15-JUN-20	R5117447
Chloromethane	<1.0		1.0	ug/L		15-JUN-20	R5117447
1,2-Dibromoethane	<0.20		0.20	ug/L		15-JUN-20	R5117447
1,2-Dichlorobenzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,3-Dichlorobenzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,4-Dichlorobenzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Dichlorodifluoromethane	<1.0		1.0	ug/L		15-JUN-20	R5117447
1,1-Dichloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,2-Dichloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,1-Dichloroethylene	<0.50		0.50	ug/L		15-JUN-20	R5117447
cis-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUN-20	R5117447
trans-1,2-Dichloroethylene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Dichloromethane	<2.0		2.0	ug/L		15-JUN-20	R5117447
1,2-Dichloropropane	<0.50		0.50	ug/L		15-JUN-20	R5117447
cis-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUN-20	R5117447
trans-1,3-Dichloropropene	<0.30		0.30	ug/L		15-JUN-20	R5117447
Ethylbenzene	<0.50		0.50	ug/L		15-JUN-20	R5117447
n-Hexane	<0.50		0.50	ug/L		15-JUN-20	R5117447
2-Hexanone	<20		20	ug/L		15-JUN-20	R5117447
Methyl Ethyl Ketone	<20		20	ug/L		15-JUN-20	R5117447
Methyl Isobutyl Ketone	<20		20	ug/L		15-JUN-20	R5117447
MTBE	<0.50		0.50	ug/L		15-JUN-20	R5117447
Styrene	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,1,1,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,1,2,2-Tetrachloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
Tetrachloroethylene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Toluene	<0.40		0.40	ug/L		15-JUN-20	R5117447
1,1,1-Trichloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
1,1,2-Trichloroethane	<0.50		0.50	ug/L		15-JUN-20	R5117447
Trichloroethylene	<0.50		0.50	ug/L		15-JUN-20	R5117447
Trichlorofluoromethane	<1.0		1.0	ug/L		15-JUN-20	R5117447

* 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
L2457851-1 WEST PROCESS POND Sampled By: CLIENT on 08-JUN-20 @ 12:30 Matrix: WATER							
Volatile Organic Compounds							
Vinyl chloride	<0.50		0.50	ug/L		15-JUN-20	R5117447
o-Xylene	<0.30		0.30	ug/L		15-JUN-20	R5117447
m+p-Xylenes	<0.40		0.40	ug/L		15-JUN-20	R5117447
Xylenes (Total)	<0.50		0.50	ug/L		15-JUN-20	
Surrogate: 4-Bromofluorobenzene	96.8		70-130	%		15-JUN-20	R5117447
Surrogate: 1,4-Difluorobenzene	100.3		70-130	%		15-JUN-20	R5117447
Trihalomethanes							
Total THMs	<2.0		2.0	ug/L		15-JUN-20	

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

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
THM-SUM-PPB-CALC-WT	Water	Total Trihalomethanes (THMs)	CALCULATION
Total Trihalomethanes (THMs) represents the sum of bromodichloromethane, bromoform, chlorodibromomethane and chloroform. For the purpose of calculation, results less than the detection limit (DL) are treated as zero.			
VOC-ROU-HS-WT	Water	Volatile Organic Compounds	SW846 8260
Aqueous samples are analyzed by headspace-GC/MS.			
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:
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: L2457851

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5117447							
WG3341451-4	DUP	WG3341451-3						
1,1,1,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,1,2,2-Tetrachloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,1,1-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,1,2-Trichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,2-Dibromoethane		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-JUN-20
1,1-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,1-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,2-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,2-Dichloroethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,2-Dichloropropane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,3-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
1,4-Dichlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
2-Hexanone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUN-20
Acetone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUN-20
Benzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Bromodichloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Bromoform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Bromomethane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Carbon Disulfide		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Carbon tetrachloride		<0.20	<0.20	RPD-NA	ug/L	N/A	30	15-JUN-20
Chlorobenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Chloroethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Chloroform		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Chloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
cis-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
cis-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUN-20
Dibromochloromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Dichlorodifluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Dichloromethane		<2.0	<2.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Ethylbenzene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
m+p-Xylenes		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-JUN-20
Methyl Ethyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUN-20
Methyl Isobutyl Ketone		<20	<20		ug/L			15-JUN-20



Quality Control Report

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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5117447							
WG3341451-4 DUP		WG3341451-3						
Methyl Isobutyl Ketone		<20	<20	RPD-NA	ug/L	N/A	30	15-JUN-20
n-Hexane		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
MTBE		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
o-Xylene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUN-20
Styrene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Tetrachloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Toluene		<0.40	<0.40	RPD-NA	ug/L	N/A	30	15-JUN-20
trans-1,2-Dichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
trans-1,3-Dichloropropene		<0.30	<0.30	RPD-NA	ug/L	N/A	30	15-JUN-20
Trichloroethylene		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
Trichlorofluoromethane		<1.0	<1.0	RPD-NA	ug/L	N/A	30	15-JUN-20
Vinyl chloride		<0.50	<0.50	RPD-NA	ug/L	N/A	30	15-JUN-20
WG3341451-1 LCS								
1,1,1,2-Tetrachloroethane			92.8		%		70-130	15-JUN-20
1,1,2,2-Tetrachloroethane			90.1		%		70-130	15-JUN-20
1,1,1-Trichloroethane			100.7		%		70-130	15-JUN-20
1,1,2-Trichloroethane			92.2		%		70-130	15-JUN-20
1,2-Dibromoethane			90.5		%		70-130	15-JUN-20
1,1-Dichloroethane			102.2		%		70-130	15-JUN-20
1,1-Dichloroethylene			93.6		%		70-130	15-JUN-20
1,2-Dichlorobenzene			100.8		%		70-130	15-JUN-20
1,2-Dichloroethane			91.4		%		70-130	15-JUN-20
1,2-Dichloropropane			92.6		%		70-130	15-JUN-20
1,3-Dichlorobenzene			100.7		%		70-130	15-JUN-20
1,4-Dichlorobenzene			101.5		%		70-130	15-JUN-20
2-Hexanone			92.2		%		60-140	15-JUN-20
Acetone			98.0		%		60-140	15-JUN-20
Benzene			98.6		%		70-130	15-JUN-20
Bromodichloromethane			98.6		%		70-130	15-JUN-20
Bromoform			93.3		%		70-130	15-JUN-20
Bromomethane			113.1		%		60-140	15-JUN-20
Carbon Disulfide			101.3		%		70-130	15-JUN-20
Carbon tetrachloride			100.3		%		70-130	15-JUN-20



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Client: GHD Limited (Waterloo)
 455 PHILLIP STREET
 WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT		Water						
Batch	R5117447							
WG3341451-1	LCS							
Chlorobenzene			100.5		%		70-130	15-JUN-20
Chloroethane			101.0		%		70-130	15-JUN-20
Chloroform			101.6		%		70-130	15-JUN-20
Chloromethane			120.0		%		60-140	15-JUN-20
cis-1,2-Dichloroethylene			87.9		%		70-130	15-JUN-20
cis-1,3-Dichloropropene			85.7		%		70-130	15-JUN-20
Dibromochloromethane			81.6		%		70-130	15-JUN-20
Dichlorodifluoromethane			104.4		%		50-140	15-JUN-20
Dichloromethane			95.9		%		70-130	15-JUN-20
Ethylbenzene			96.5		%		70-130	15-JUN-20
m+p-Xylenes			96.9		%		70-130	15-JUN-20
Methyl Ethyl Ketone			76.6		%		60-140	15-JUN-20
Methyl Isobutyl Ketone			91.0		%		50-150	15-JUN-20
n-Hexane			96.4		%		70-130	15-JUN-20
MTBE			100.8		%		70-130	15-JUN-20
o-Xylene			105.1		%		70-130	15-JUN-20
Styrene			94.5		%		70-130	15-JUN-20
Tetrachloroethylene			103.4		%		70-130	15-JUN-20
Toluene			102.3		%		70-130	15-JUN-20
trans-1,2-Dichloroethylene			93.8		%		70-130	15-JUN-20
trans-1,3-Dichloropropene			93.7		%		70-130	15-JUN-20
Trichloroethylene			100.9		%		70-130	15-JUN-20
Trichlorofluoromethane			92.9		%		60-140	15-JUN-20
Vinyl chloride			108.9		%		60-140	15-JUN-20
WG3341451-2	MB							
1,1,1,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JUN-20
1,1,2,2-Tetrachloroethane			<0.50		ug/L		0.5	15-JUN-20
1,1,1-Trichloroethane			<0.50		ug/L		0.5	15-JUN-20
1,1,2-Trichloroethane			<0.50		ug/L		0.5	15-JUN-20
1,2-Dibromoethane			<0.20		ug/L		0.2	15-JUN-20
1,1-Dichloroethane			<0.50		ug/L		0.5	15-JUN-20
1,1-Dichloroethylene			<0.50		ug/L		0.5	15-JUN-20
1,2-Dichlorobenzene			<0.50		ug/L		0.5	15-JUN-20
1,2-Dichloroethane			<0.50		ug/L		0.5	15-JUN-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5117447							
WG3341451-2 MB								
1,2-Dichloropropane			<0.50		ug/L		0.5	15-JUN-20
1,3-Dichlorobenzene			<0.50		ug/L		0.5	15-JUN-20
1,4-Dichlorobenzene			<0.50		ug/L		0.5	15-JUN-20
2-Hexanone			<20		ug/L		20	15-JUN-20
Acetone			<20		ug/L		20	15-JUN-20
Benzene			<0.50		ug/L		0.5	15-JUN-20
Bromodichloromethane			<1.0		ug/L		1	15-JUN-20
Bromoform			<1.0		ug/L		1	15-JUN-20
Bromomethane			<0.50		ug/L		0.5	15-JUN-20
Carbon Disulfide			<1.0		ug/L		1	15-JUN-20
Carbon tetrachloride			<0.20		ug/L		0.2	15-JUN-20
Chlorobenzene			<0.50		ug/L		0.5	15-JUN-20
Chloroethane			<1.0		ug/L		1	15-JUN-20
Chloroform			<1.0		ug/L		1	15-JUN-20
Chloromethane			<1.0		ug/L		1	15-JUN-20
cis-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JUN-20
cis-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JUN-20
Dibromochloromethane			<1.0		ug/L		1	15-JUN-20
Dichlorodifluoromethane			<1.0		ug/L		1	15-JUN-20
Dichloromethane			<2.0		ug/L		2	15-JUN-20
Ethylbenzene			<0.50		ug/L		0.5	15-JUN-20
m+p-Xylenes			<0.40		ug/L		0.4	15-JUN-20
Methyl Ethyl Ketone			<20		ug/L		20	15-JUN-20
Methyl Isobutyl Ketone			<20		ug/L		20	15-JUN-20
n-Hexane			<0.50		ug/L		0.5	15-JUN-20
MTBE			<0.50		ug/L		0.5	15-JUN-20
o-Xylene			<0.30		ug/L		0.3	15-JUN-20
Styrene			<0.50		ug/L		0.5	15-JUN-20
Tetrachloroethylene			<0.50		ug/L		0.5	15-JUN-20
Toluene			<0.40		ug/L		0.4	15-JUN-20
trans-1,2-Dichloroethylene			<0.50		ug/L		0.5	15-JUN-20
trans-1,3-Dichloropropene			<0.30		ug/L		0.3	15-JUN-20
Trichloroethylene			<0.50		ug/L		0.5	15-JUN-20



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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5117447							
WG3341451-2 MB								
Trichlorofluoromethane			<1.0		ug/L		1	15-JUN-20
Vinyl chloride			<0.50		ug/L		0.5	15-JUN-20
Surrogate: 1,4-Difluorobenzene			101.2		%		70-130	15-JUN-20
Surrogate: 4-Bromofluorobenzene			96.1		%		70-130	15-JUN-20
WG3341451-5 MS		WG3341451-3						
1,1,1,2-Tetrachloroethane			94.4		%		50-150	15-JUN-20
1,1,2,2-Tetrachloroethane			96.0		%		50-150	15-JUN-20
1,1,1-Trichloroethane			99.0		%		50-150	15-JUN-20
1,1,2-Trichloroethane			96.6		%		50-150	15-JUN-20
1,2-Dibromoethane			95.4		%		50-150	15-JUN-20
1,1-Dichloroethane			102.4		%		50-150	15-JUN-20
1,1-Dichloroethylene			88.5		%		50-150	15-JUN-20
1,2-Dichlorobenzene			100.5		%		50-150	15-JUN-20
1,2-Dichloroethane			96.8		%		50-150	15-JUN-20
1,2-Dichloropropane			96.4		%		50-150	15-JUN-20
1,3-Dichlorobenzene			97.3		%		50-150	15-JUN-20
1,4-Dichlorobenzene			97.5		%		50-150	15-JUN-20
2-Hexanone			100.1		%		50-150	15-JUN-20
Acetone			108.0		%		50-150	15-JUN-20
Benzene			99.5		%		50-150	15-JUN-20
Bromodichloromethane			102.9		%		50-150	15-JUN-20
Bromoform			98.6		%		50-150	15-JUN-20
Bromomethane			105.4		%		50-150	15-JUN-20
Carbon Disulfide			91.1		%		50-150	15-JUN-20
Carbon tetrachloride			97.6		%		50-150	15-JUN-20
Chlorobenzene			100.0		%		50-150	15-JUN-20
Chloroethane			95.6		%		50-150	15-JUN-20
Chloroform			103.9		%		50-150	15-JUN-20
Chloromethane			108.0		%		50-150	15-JUN-20
cis-1,2-Dichloroethylene			88.1		%		50-150	15-JUN-20
cis-1,3-Dichloropropene			83.0		%		50-150	15-JUN-20
Dibromochloromethane			85.6		%		50-150	15-JUN-20
Dichlorodifluoromethane			84.5		%		50-150	15-JUN-20
Dichloromethane			96.6		%		50-150	15-JUN-20



Environmental

Quality Control Report

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Client: GHD Limited (Waterloo)
455 PHILLIP STREET
WATERLOO ON N2L 3X2

Contact: LAURA ERMETA

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
VOC-ROU-HS-WT								
	Water							
Batch	R5117447							
WG3341451-5	MS	WG3341451-3						
Ethylbenzene			93.9		%		50-150	15-JUN-20
m+p-Xylenes			93.7		%		50-150	15-JUN-20
Methyl Ethyl Ketone			90.4		%		50-150	15-JUN-20
Methyl Isobutyl Ketone			99.6		%		50-150	15-JUN-20
n-Hexane			89.4		%		50-150	15-JUN-20
MTBE			100.9		%		50-150	15-JUN-20
o-Xylene			103.7		%		50-150	15-JUN-20
Styrene			93.6		%		50-150	15-JUN-20
Tetrachloroethylene			97.2		%		50-150	15-JUN-20
Toluene			100.8		%		50-150	15-JUN-20
trans-1,2-Dichloroethylene			88.9		%		50-150	15-JUN-20
trans-1,3-Dichloropropene			88.9		%		50-150	15-JUN-20
Trichloroethylene			98.2		%		50-150	15-JUN-20
Trichlorofluoromethane			86.4		%		50-150	15-JUN-20
Vinyl chloride			97.2		%		50-150	15-JUN-20

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WATERLOO ON N2L 3X2
Contact: LAURA ERMETA

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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
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.

Appendix D

Analytical Data Verification Memo



Memorandum

December 7, 2020

To: Meghan O'Brien, Diana Ball, Jim Yardley

Ref. No.: 044985-20 & -30

From: ^{LE} Laura Ermeta/an/70

Tel: 519-340-4375

**Subject: Analytical Data Verification
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

1. Introduction

The following document details an analytical data verification of results for surface water samples collected at the Clean Harbors Canada Inc. site in Sarnia, Ontario from January to June 2020. Samples were submitted to ALS Canada Ltd. (ALS) located in Edmonton, Alberta for microtox analysis as well as Waterloo, Ontario for all remaining analyses. A sample collection and analysis summary is presented in Table 1. A summary of the analytical methodology is presented in Table 2.

Standard GHD report deliverables were submitted by the laboratory. The final results and supporting quality assurance/quality control (QA/QC) data were assessed. Evaluation of the data was based on information obtained from the chain of custody forms, finished report forms, method blank data, duplicate data, recovery data from surrogate spikes, laboratory control samples (LCS) and matrix spikes (MS).

The QA/QC criteria by which these data have been assessed are outlined in the analytical methods referenced in Table 2 and applicable guidance from the documents entitled:

- i) "National Functional Guidelines for Superfund Organic Methods Data Review", USEPA-540-R-2016-002, September 2016
- ii) "National Functional Guidelines for Inorganic Superfund Methods Data Review", USEPA-540-R-2016-001, September 2016

Items i) and ii) will subsequently be referred to as the "Guidelines" in this Memorandum.

2. Sample Holding Time and Preservation

The sample holding time criteria for the analyses are summarized in Table 2. Sample chain of custody documents and analytical reports were used to determine sample holding times. Most samples were prepared and analyzed within the required holding times. Sample data that were obtained past the recommended holding time have been qualified as estimated (see Table 3).



Most samples were properly preserved, delivered with ice packs and were stored by the laboratory at the required temperature (<10°C). The samples summarized in Table 4 were qualified due to high temperature upon arrival at the laboratory.

3. Laboratory Method Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures.

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

4. Surrogate Spike Recoveries

In accordance with the methods employed, all samples, blanks, and QC samples analyzed for organics are spiked with surrogate compounds prior to sample extraction and/or analysis. Surrogate recoveries provide a means to evaluate the effects of laboratory performance on individual sample matrices.

All samples submitted for volatile organic compound (VOC) and semi-volatile organic compound (SVOC) determinations were spiked with the appropriate number of surrogate compounds prior to sample analysis.

Surrogate recoveries were assessed against laboratory control limits. Most surrogate recoveries met the above criteria. Surrogate 2,4,6-tribromophenol in report L2418792 had a high recovery. Non-detect results associated with high surrogate recoveries were not qualified. The indicated high bias would not impact the data.

5. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the methods employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

Organic Analyses

The LCS contained all compounds of interest. Most LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy. Select SVOCs had low LCS recoveries reported. Non-detect results associated with these high LCS recoveries were not qualified. Non-detect results associated with these low LCS recoveries were qualified as estimated (see Table 5).



Inorganic Analyses

The LCS contained all analytes of interest. LCS recoveries were assessed per the "Guidelines". All LCS recoveries were within the control limits, demonstrating acceptable analytical accuracy.

6. Matrix Spike Analyses

To evaluate the effects of sample matrices on the extraction or digestion process, measurement procedures, and accuracy of a particular analysis, samples are spiked with a known concentration of the analyte of concern and analyzed as MS samples. If the original sample concentration is significantly greater than the spike concentration, the recovery is not assessed.

Organic Analyses

The MS samples were spiked with all compounds of interest. All percent recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy.

Inorganic Analyses

The MS samples were spiked with the analytes of interest, and the results were evaluated using the "Guidelines". All percent recoveries were within the control limits, demonstrating acceptable analytical accuracy.

7. Duplicate Sample Analyses

Analytical precision is evaluated based on the analysis of laboratory duplicate samples. For this study, duplicate samples were prepared and analyzed by the laboratory. The laboratory performed additional site-specific duplicate analyses internally. The relative percent differences (RPDs) associated with these duplicate samples must be less than 20 percent for water samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is a difference of one times the RL value for water samples. All duplicate analyses performed were acceptable, demonstrating acceptable analytical precision.

8. Total Calcium and Magnesium Data Used For Hardness Calculation

Hardness results were flagged by the laboratory because the values were calculated using total calcium and magnesium concentrations. The associated sample results have been qualified as estimated as the results may be biased high (see Table 6).



9. Conclusion

Based on the assessment detailed in the foregoing, the data are acceptable with the specific qualifications noted herein.

**Analytical Method and Holding Time Criteria
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Parameters	Methodology ⁽¹⁾	Holding Time Criteria ⁽²⁾
		Water
Volatile Organic Compounds	SW846 8260	14 days
Semi-volatile Organic Compounds	SW846 8270	14 days
Metals	SW846 6020/EPA 200.8	60 days
Mercury	EPA 1631	28 days
Hexavalent Chromium	SW846 7199	28 days
Hardness	SM 2340B	60 days
pH	SM 4500H	28 days
Ammonia-N	EPA 350.1	28 days
Un-ionized ammonia-N	Calculation	NA
Anions (Nitrite-N, Nitrate-N)	EPA 300.1	3 days
Anions (Chloride, Bromide, Fluoride, Sulphate)	EPA 300.1	28 days
Alkalinity	EPA 310.1	14 days
Conductivity	SM 2510	28 days
Total Dissolved Solids	SM 2540C	7 days
Total Suspended Solids	SM 2540D	7 days
Cyanide, total	SM 4500 CN-E	14 days
Total Phosphorus	SM4500P-F	28 days
Total Kjeldahl Nitrogen	SM 4500 NORGA	28 days
Chemical Oxygen Demand	SM 5220D	28 days
Dissolved Organic Carbon (lab filtered)	SM 5310B	3 days
Phenols	SW846 79066	28 days
Microtox	ERCB Directive 050 / EPS 1/RM/24	2 days for unrefrigerated samples; 7 days for refrigerated samples

Notes:

⁽¹⁾ Methods referenced from the following:

SW846 - "Test Method for Evaluating Solid Waste Physical/Chemical Methods", EPA, November 1986
with promulgated updates

SM - Standard Methods for the Examination of Water and Wastewater", 21st Ed., APHA, September 2005

EPA - "Methods for Chemical Analysis of Water and Wastes", EPA 600/4 79 020, Revised

ERCB - Energy Resources Conservation Board

EPS - Environmental Protection Series

⁽²⁾ Holding times differing from those defined in the indicated methodology were obtained from the
Canadian Council of Ministers of the Environment (CCME) or O. Reg. 153 Analytical Protocol

N - Nitrogen

NA - Not applicable

Table 3

**Qualified Sample Data Due To Holding Time Exceedance
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Sample ID	Holding Time	Holding Time Criteria	Analyte	Qualified Sample Results	Units
L2455359	Microtox	EQ POND DISCHARGE	3 days	2 days	EC 20 (15min)	<100 J	%
L2455359	Microtox	EQ POND DISCHARGE	3 days	2 days	EC 20 (5min)	<100 J	%
L2455359	Microtox	EQ POND DISCHARGE	3 days	2 days	EC 50 (15min)	<100 J	%
L2455359	Microtox	EQ POND DISCHARGE	3 days	2 days	EC 50 (5min)	<100 J	%
L2418792	Gen Chem	EQ POND DISCHARGE	4 days	3 days	Nitrate (as N)	0.247 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	4 days	3 days	Nitrite (as N)	0.010 UJ	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	4 days	3 days	Nitrate (as N)	0.162 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	4 days	3 days	Nitrite (as N)	0.010 UJ	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	4 days	3 days	Nitrate (as N)	0.149 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	4 days	3 days	Nitrite (as N)	0.010 UJ	mg/L

Notes:

J - Estimated concentration

UJ - Not detected; associated reporting limit is estimated

Gen Chem - General Chemistry

N - Nitrogen

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	1,2,4-Trichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	1,2-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	1,3-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	1,4-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	1-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,3,4,5-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,3,4,6-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,3,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4,5-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4-Dichlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4-Dimethylphenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4-Dinitrophenol	1.0 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,4-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2,6-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2-Chlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	2-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	3,3'-Dichlorobenzidine	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	4-Chloroaniline	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Acenaphthene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Acenaphthylene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Benzo(a)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Benzo(a)pyrene	0.050 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Benzo(b)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Benzo(g,h,i)perylene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Benzo(k)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	bis(2-Chloroethyl)ether	0.40 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	bis(2-Ethylhexyl)phthalate (DEHP)	2.0 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Chrysene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Dibenz(a,h)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Diethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Dimethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Fluorene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Hexachlorobenzene	0.040 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Hexachlorobutadiene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Indeno(1,2,3-cd)pyrene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Naphthalene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Pentachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Perylene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Phenanthrene	0.20 UJ	µg/L
L2418792	SVOCs	EAST STORM WATER POND	13.1	10	Pyrene	0.20 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Acetone	20 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Benzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Bromodichloromethane	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Bromoform	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Carbon tetrachloride	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Chlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Chloroethane	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	cis-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Dibromochloromethane	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Ethylbenzene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Hexane	0.50 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2418792	VOCs	EAST STORM WATER POND	13.1	10	m&p-Xylenes	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Methylene chloride	2.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	o-Xylene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Styrene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Tetrachloroethene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Toluene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	trans-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Trichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Trihalomethanes	2.0 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Vinyl chloride	0.50 UJ	µg/L
L2418792	VOCs	EAST STORM WATER POND	13.1	10	Xylenes (total)	1.1 UJ	µg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Alkalinity, total (as CaCO3)	145 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Ammonia-N	0.484 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Bromide	1.39 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Chemical oxygen demand (COD)	15 J-	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Chloride	65.6 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Chromium VI (hexavalent)	0.00082 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Conductivity	807 J	umhos/cm
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Cyanide (total)	0.0020 UJ	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Dissolved organic carbon (DOC) (dissolved)	4.80 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Fluoride	0.512 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Nitrate (as N)	0.149 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Nitrite (as N)	0.010 UJ	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	pH, lab	8.12 J	s.u.
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Phenolics (total)	0.0053 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Phosphorus	0.0344 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Sulfate	160 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Total dissolved solids (TDS)	486 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Total kjeldahl nitrogen (TKN)	0.90 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Total suspended solids (TSS)	8.5 J	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	13.1	10	Un-ionized ammonia	0.00430 J	mg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	1,2,4-Trichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	1,2-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	1,3-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	1,4-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	1-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,3,4,5-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,3,4,6-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,3,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4,5-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4-Dichlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4-Dimethylphenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4-Dinitrophenol	1.0 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,4-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2,6-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2-Chlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	2-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	3,3'-Dichlorobenzidine	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	4-Chloroaniline	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Acenaphthene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Acenaphthylene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Benzo(a)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Benzo(a)pyrene	0.050 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Benzo(b)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Benzo(g,h,i)perylene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Benzo(k)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	bis(2-Chloroethyl)ether	0.40 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	bis(2-Ethylhexyl)phthalate (DEHP)	2.0 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Chrysene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Dibenz(a,h)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Diethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Dimethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Fluorene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Hexachlorobenzene	0.040 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Hexachlorobutadiene	0.20 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Indeno(1,2,3-cd)pyrene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Naphthalene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Pentachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Perylene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Phenanthrene	0.20 UJ	µg/L
L2418792	SVOCs	EQ POND DISCHARGE	13.1	10	Pyrene	0.20 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Acetone	20 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Benzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Bromodichloromethane	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Bromoform	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Carbon tetrachloride	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Chlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Chloroethane	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	cis-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Dibromochloromethane	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Ethylbenzene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Hexane	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	m&p-Xylenes	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Methylene chloride	2.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	o-Xylene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Styrene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Tetrachloroethene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Toluene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	trans-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Trichloroethene	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Vinyl chloride	0.50 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Xylenes (total)	1.1 UJ	µg/L
L2418792	VOCs	EQ POND DISCHARGE	13.1	10	Trihalomethanes	2.0 UJ	µg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Alkalinity, total (as CaCO3)	168 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Ammonia-N	0.65 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Bromide	1.59 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Chemical oxygen demand (COD)	18 J-	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Chloride	65.4 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Chromium VI (hexavalent)	0.00081 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Conductivity	775 J	umhos/cm
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Cyanide (total)	0.0020 UJ	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Dissolved organic carbon (DOC) (dissolved)	4.41 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Fluoride	0.546 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Nitrate (as N)	0.247 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Nitrite (as N)	0.010 UJ	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	pH, lab	8.03 J	s.u.
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Phenolics (total)	0.0118 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Phosphorus	0.0328 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Sulfate	151 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Total dissolved solids (TDS)	486 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Total kjeldahl nitrogen (TKN)	1.14 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Total suspended solids (TSS)	5.4 J	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	13.1	10	Un-ionized ammonia	0.00184 J	mg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	1,2,4-Trichlorobenzene	0.40 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	1,2-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	1,3-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	1,4-Dichlorobenzene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	1-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,3,4,5-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,3,4,6-Tetrachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,3,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4,5-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4,6-Trichlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4-Dichlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4-Dimethylphenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4-Dinitrophenol	1.0 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,4-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2,6-Dinitrotoluene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2-Chlorophenol	0.30 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	2-Methylnaphthalene	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	3,3'-Dichlorobenzidine	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	4-Chloroaniline	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Acenaphthene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Acenaphthylene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Anthracene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Benzo(a)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Benzo(a)pyrene	0.050 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Benzo(b)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Benzo(g,h,i)perylene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Benzo(k)fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	bis(2-Chloroethyl)ether	0.40 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	bis(2-Ethylhexyl)phthalate (DEHP)	2.0 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Chrysene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Dibenz(a,h)anthracene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Diethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Dimethyl phthalate	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Fluoranthene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Fluorene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Hexachlorobenzene	0.040 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Hexachlorobutadiene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Indeno(1,2,3-cd)pyrene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Naphthalene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Pentachlorophenol	0.50 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Perylene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Phenanthrene	0.20 UJ	µg/L
L2418792	SVOCs	WEST STORM WATER POND	13.1	10	Pyrene	0.20 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Acetone	20 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Benzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Bromodichloromethane	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Bromoform	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Carbon tetrachloride	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Chlorobenzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Chloroethane	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	cis-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Dibromochloromethane	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Ethylbenzene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Hexane	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	m&p-Xylenes	1.0 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Methylene chloride	2.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	o-Xylene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Styrene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Tetrachloroethene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Toluene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	trans-1,3-Dichloropropene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Trichloroethene	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Vinyl chloride	0.50 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Xylenes (total)	1.1 UJ	µg/L
L2418792	VOCs	WEST STORM WATER POND	13.1	10	Trihalomethanes	2.0 UJ	µg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Alkalinity, total (as CaCO3)	128 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Ammonia-N	0.66 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Bromide	1.56 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Chemical oxygen demand (COD)	16 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Chloride	65.4 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Chromium VI (hexavalent)	0.00091 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Conductivity	777 J	umhos/cm
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Cyanide (total)	0.0020 UJ	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Dissolved organic carbon (DOC) (dissolved)	5.13 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Fluoride	0.537 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Nitrate (as N)	0.162 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Nitrite (as N)	0.010 UJ	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	pH, lab	8.08 J	s.u.
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Phenolics (total)	0.0087 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Phosphorus	0.0323 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Sulfate	152 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Total dissolved solids (TDS)	454 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Total kjeldahl nitrogen (TKN)	1.10 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Total suspended solids (TSS)	5.9 J	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	13.1	10	Un-ionized ammonia	0.00325 J	mg/L
L2420428	VOCs	EQ POND	12.2	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	2-Hexanone	20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Acetone	20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Benzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Bromodichloromethane	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Bromoform	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Carbon disulfide	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Carbon tetrachloride	0.20 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Chlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Chloroethane	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Dibromochloromethane	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Ethylbenzene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Hexane	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	m&p-Xylenes	0.40 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Methylene chloride	2.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	o-Xylene	0.30 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Styrene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Tetrachloroethene	0.50 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2420428	VOCs	EQ POND	12.2	10	Toluene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Trichloroethene	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Trihalomethanes	2.0 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Vinyl chloride	0.50 UJ	µg/L
L2420428	VOCs	EQ POND	12.2	10	Xylenes (total)	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	2-Hexanone	20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Acetone	20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Benzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Bromodichloromethane	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Bromoform	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Carbon disulfide	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Carbon tetrachloride	0.20 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Chlorobenzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Chloroethane	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Dibromochloromethane	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Ethylbenzene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Hexane	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	m&p-Xylenes	0.40 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Methylene chloride	2.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	o-Xylene	0.30 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Styrene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Tetrachloroethene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Toluene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Trichloroethene	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Trihalomethanes	2.0 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Vinyl chloride	0.50 UJ	µg/L
L2420428	VOCs	WEST RETENTION POND	12.2	10	Xylenes (total)	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	2-Hexanone	20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Acetone	20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Benzene	0.50 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2423731	VOCs	EQ POND	12.1	10	Bromodichloromethane	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Bromoform	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Carbon disulfide	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Carbon tetrachloride	0.20 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Chlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Chloroethane	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Dibromochloromethane	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Ethylbenzene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Hexane	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	m&p-Xylenes	0.40 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Methylene chloride	2.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	o-Xylene	0.30 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Styrene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Tetrachloroethene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Toluene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Trichloroethene	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Trihalomethanes	2.0 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Vinyl chloride	0.50 UJ	µg/L
L2423731	VOCs	EQ POND	12.1	10	Xylenes (total)	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	2-Hexanone	20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Acetone	20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Benzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Bromodichloromethane	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Bromoform	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Carbon disulfide	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Carbon tetrachloride	0.20 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Chlorobenzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Chloroethane	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Dibromochloromethane	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Ethylbenzene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Hexane	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	m&p-Xylenes	0.40 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Methylene chloride	2.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	o-Xylene	0.30 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Styrene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Tetrachloroethene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Toluene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Trichloroethene	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
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Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2423731	VOCs	WEST RETENTION POND	12.1	10	Trihalomethanes	2.0 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Vinyl chloride	0.50 UJ	µg/L
L2423731	VOCs	WEST RETENTION POND	12.1	10	Xylenes (total)	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	2-Hexanone	20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Acetone	20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Benzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Bromodichloromethane	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Bromoform	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Carbon disulfide	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Carbon tetrachloride	0.20 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Chlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Chloroethane	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Dibromochloromethane	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Ethylbenzene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Hexane	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	m&p-Xylenes	0.40 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Methylene chloride	2.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	o-Xylene	0.30 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Styrene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Tetrachloroethene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Toluene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Trichloroethene	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Trihalomethanes	2.0 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Vinyl chloride	0.50 UJ	µg/L
L2425943	VOCs	EAST STORM POND	12.8	10	Xylenes (total)	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	2-Hexanone	20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Acetone	20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Benzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Bromodichloromethane	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Bromoform	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Carbon disulfide	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Carbon tetrachloride	0.20 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Chlorobenzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Chloroethane	1.0 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2425943	VOCs	WEST STORM POND	12.8	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Dibromochloromethane	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Ethylbenzene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Hexane	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	m&p-Xylenes	0.40 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Methylene chloride	2.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	o-Xylene	0.30 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Styrene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Tetrachloroethene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Toluene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Trichloroethene	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Trihalomethanes	2.0 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Vinyl chloride	0.50 UJ	µg/L
L2425943	VOCs	WEST STORM POND	12.8	10	Xylenes (total)	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	2-Hexanone	20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Acetone	20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Benzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Bromodichloromethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Bromoform	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Carbon disulfide	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Carbon tetrachloride	0.20 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Chlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Chloroethane	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Dibromochloromethane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Ethylbenzene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Hexane	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	m&p-Xylenes	0.40 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Methylene chloride	2.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	o-Xylene	0.30 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Styrene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Tetrachloroethene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Toluene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Trichloroethene	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Trihalomethanes	1.6 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Vinyl chloride	0.50 UJ	µg/L
L2430825	VOCs	EAST STORM POND	11.9	10	Xylenes (total)	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L

**Qualified Sample Data Due To Insufficient Sample Preservation - Temperature
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2430825	VOCs	WEST STORM POND	11.9	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	2-Hexanone	20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Acetone	20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Benzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Bromodichloromethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Bromoform	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Carbon disulfide	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Carbon tetrachloride	0.20 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Chlorobenzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Chloroethane	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Dibromochloromethane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Ethylbenzene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Hexane	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	m&p-Xylenes	0.40 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Methylene chloride	2.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	o-Xylene	0.30 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Styrene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Tetrachloroethene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Toluene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Trichloroethene	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Trihalomethanes	1.6 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Vinyl chloride	0.50 UJ	µg/L
L2430825	VOCs	WEST STORM POND	11.9	10	Xylenes (total)	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1,1,2-Tetrachloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1,1-Trichloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1,2,2-Tetrachloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1,2-Trichloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1-Dichloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,1-Dichloroethene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,2-Dibromoethane (Ethylene dibromide)	0.20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,2-Dichlorobenzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,2-Dichloroethane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,2-Dichloropropane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,3-Dichlorobenzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	1,4-Dichlorobenzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	2-Butanone (Methyl ethyl ketone) (MEK)	20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	2-Hexanone	20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	4-Methyl-2-pentanone (Methyl isobutyl ketone) (MIBK)	20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Acetone	20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Benzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Bromodichloromethane	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Bromoform	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Bromomethane (Methyl bromide)	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Carbon disulfide	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Carbon tetrachloride	0.20 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Chlorobenzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Chloroethane	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Chloroform (Trichloromethane)	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Chloromethane (Methyl chloride)	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	cis-1,2-Dichloroethene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	cis-1,3-Dichloropropene	0.30 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Dibromochloromethane	1.0 UJ	µg/L

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Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Associated Sample ID	Temp. Upon Receipt at Laboratory (°C)	Required Temperature (°C)	Analyte	Qualified Result	Units
L2457851	VOCs	WEST PROCESS POND	14.7	10	Dichlorodifluoromethane (CFC-12)	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Ethylbenzene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Hexane	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	m&p-Xylenes	0.40 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Methyl tert butyl ether (MTBE)	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Methylene chloride	2.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	o-Xylene	0.30 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Styrene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Tetrachloroethene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Toluene	0.40 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	trans-1,2-Dichloroethene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	trans-1,3-Dichloropropene	0.30 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Trichloroethene	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Trichlorofluoromethane (CFC-11)	1.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Trihalomethanes	2.0 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Vinyl chloride	0.50 UJ	µg/L
L2457851	VOCs	WEST PROCESS POND	14.7	10	Xylenes (total)	0.50 UJ	µg/L

Notes:

J- - Estimated concentration, the result may be biased low
 J - Estimated concentration
 UJ - Not detected; associated reporting limit is estimated
 Gen Chem - General Chemistry
 SVOCs - Semi-volatile Organic Compounds
 VOCs - Volatile Organic Compounds
 s.u. - Standard Units
 N - Nitrogen

Table 5

**Qualified Sample Results Due To Outlying Laboratory Control Sample Results
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Analyte	LCS	Control Limits	Associated Sample ID	Qualified Results	Units
			% Recovery	% Recovery			
L2405226	SVOCs	1,3-Dichlorobenzene	49.2	50-140	EQ POND DISCHARGE	1.0 UJ	µg/L
L2405226	SVOCs	3,3'-Dichlorobenzidine	26.7	50-140	EQ POND DISCHARGE	1.0 UJ	µg/L
L2405226	SVOCs	4-Chloroaniline	27.8	30-140	EQ POND DISCHARGE	1.0 UJ	µg/L
L2405226	SVOCs	1,3-Dichlorobenzene	49.2	50-140	WEST STORM WATER POND	1.0 UJ	µg/L
L2405226	SVOCs	3,3'-Dichlorobenzidine	26.7	50-140	WEST STORM WATER POND	1.0 UJ	µg/L
L2405226	SVOCs	4-Chloroaniline	27.8	30-140	WEST STORM WATER POND	1.0 UJ	µg/L
L2405226	SVOCs	1,3-Dichlorobenzene	49.2	50-140	ERP-EAST STORM WATER POND	1.0 UJ	µg/L
L2405226	SVOCs	3,3'-Dichlorobenzidine	26.7	50-140	ERP-EAST STORM WATER POND	1.0 UJ	µg/L
L2405226	SVOCs	4-Chloroaniline	27.8	30-140	ERP-EAST STORM WATER POND	1.0 UJ	µg/L
L2436395	SVOCs	1,2,4-Trichlorobenzene	42.5	50-140	EQ POND DISCHARGE	0.40 UJ	µg/L
L2436395	SVOCs	1,3-Dichlorobenzene	40.6	50-140	EQ POND DISCHARGE	0.40 UJ	µg/L
L2436395	SVOCs	Hexachlorobutadiene	36.9	40-130	EQ POND DISCHARGE	0.20 UJ	µg/L
L2436395	SVOCs	1,2,4-Trichlorobenzene	42.5	50-140	WEST STORM WATER POND	0.40 UJ	µg/L
L2436395	SVOCs	1,3-Dichlorobenzene	40.6	50-140	WEST STORM WATER POND	0.40 UJ	µg/L
L2436395	SVOCs	Hexachlorobutadiene	36.9	40-130	WEST STORM WATER POND	0.20 UJ	µg/L
L2436395	SVOCs	1,2,4-Trichlorobenzene	42.5	50-140	EAST STORM WATER POND	0.40 UJ	µg/L
L2436395	SVOCs	1,3-Dichlorobenzene	40.6	50-140	EAST STORM WATER POND	0.40 UJ	µg/L
L2436395	SVOCs	Hexachlorobutadiene	36.9	40-130	EAST STORM WATER POND	0.20 UJ	µg/L

Notes:

LCS - Laboratory Control Sample

UJ - Not detected; associated reporting limit is estimated

SVOCs - Semi-volatile Organic Compounds

**Qualified Sample Data Due To Total Calcium and
Magnesium Data Used For Hardness Calculation
Surface Water Sampling Events
Clean Harbors Canada Inc.
Sarnia, Ontario
January to June 2020**

Lab Report #	Parameter	Sample ID	Analyte	Qualified Result	Units
L2405226	Gen Chem	EQ POND DISCHARGE	Hardness	283 J+	mg/L
L2405226	Gen Chem	WEST STORM WATER POND	Hardness	293 J+	mg/L
L2405226	Gen Chem	ERP-EAST STORM WATER POND	Hardness	311 J+	mg/L
L2418792	Gen Chem	EQ POND DISCHARGE	Hardness	288 J+	mg/L
L2418792	Gen Chem	WEST STORM WATER POND	Hardness	289 J+	mg/L
L2418792	Gen Chem	EAST STORM WATER POND	Hardness	301 J+	mg/L
L2436395	Gen Chem	EQ POND DISCHARGE	Hardness	280 J+	mg/L
L2436395	Gen Chem	WEST STORM WATER POND	Hardness	429 J+	mg/L
L2436395	Gen Chem	EAST STORM WATER POND	Hardness	285 J+	mg/L

Notes:

J+ - Estimated concentration, result may be biased high
Gen Chem - General Chemistry

Appendix E

CEP Declaration, Monitoring, and Screening Checklist

Appendix D-Monitoring and Screening Checklist General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.

Instructions: A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

Definition of Surface water CEP:

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Clean Harbors Canada, Inc. - Lambton Facility
Location (e.g. street address, lot, concession)	4090 Telfer Road, R.R. #1, Corunna, Ontario, N0N 1G0
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 83; Zone 17; Easting (m) 393726; Northing (m) 4748167; Horizontal Accuracy +/-3m
Municipality	Lambton County
Client and/or Site Owner	Clean Harbors Canada, Inc.
Monitoring Period (Year)	January 1 through December 31, 2020
This Monitoring Report is being submitted under the following:	
Certificate of Approval No.:	ECA A031806
Director's Order No.:	Not applicable
Provincial Officer's Order No.:	Not applicable
Other:	Document relates to surface water monitoring only

Report Submission Frequency	<input checked="" type="radio"/> Annual <input type="radio"/> Other	
The site is:	<input checked="" type="radio"/> Active <input type="radio"/> Inactive <input type="radio"/> Closed	
If closed, specify C of A, control or authorizing document closure date:		
Has the nature of the operations at the site changed during this monitoring period?	<input type="radio"/> Yes <input checked="" type="radio"/> No	
If yes, provide details:		
Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i. e. exceeded the LEL for methane)	<input type="radio"/> Yes <input checked="" type="radio"/> No	

Groundwater WDS Verification:

Based on all available information about the site and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

<p>1) The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No</p>	<p>Not Applicable - Surface water report</p>
<p>2) All groundwater, leachate and WDS gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by Certificate(s) of Approval or other relevant authorizing/control document(s):</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>

Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date
Not Applicable		

<p>3) a) Some or all groundwater, leachate and WDS gas sampling and monitoring requirements have been established or defined outside of a ministry C of A, authorizing, or control document.</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable</p>	
<p>b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach additional information.</p>
<p>Groundwater Sampling Location</p>	<p>Description/Explanation for change (change in name or location, additions, deletions)</p>	<p>Date</p>
<p>Not Applicable</p>		
<p>4) All field work for groundwater investigations was done in accordance with standard operating procedures as established/outlined per the Technical Guidance Document (including internal/external QA/QC requirements) (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, specify (Type Here):</p>

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, the potential design and operational concerns/ exceptions are as follows (Type Here):</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list and explain exceptions (Type Here):</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site: (a) There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/treatment; or (b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or (c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation): <i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and <i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input type="radio"/> Yes <input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a) <input type="checkbox"/> (b) <input type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):</p>	

Groundwater CEP Declaration:

I am a licensed professional Engineer or a registered professional geoscientist in Ontario with expertise in hydrogeology, as defined in Appendix D under Instructions. Where additional expertise was needed to evaluate the site monitoring data, I have relied on individuals who I believe to be experts in the relevant discipline, who have co-signed the compliance monitoring report or monitoring program status report, and who have provided evidence to me of their credentials.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended), and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature and will be rectified for the next monitoring/reporting period. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Select Date

Recommendations:




Based on my technical review of the monitoring results for the waste disposal site:

No changes to the monitoring program are recommended

The following change(s) to the monitoring program is/are recommended:

No Changes to site design and operation are recommended

The following change(s) to the site design and operation is/are recommended:

Name:			
Seal:	Add Image		
Signature:		Date:	
CEP Contact Information:			
Company:			
Address:			
Telephone No.:		Fax No. :	
E-mail Address:	Type Here		
Co-signers for additional expertise provided:			
Signature:		Date:	
Signature:		Date:	

Surface Water WDS Verification:

Provide the name of surface water body/bodies potentially receiving the WDS effluent and the approximate distance to the waterbody (including the nearest surface water body/bodies to the site):

Name (s)	The WDS effluent drains into the Telfer Road drainage ditch and associated drains with eventually discharge to Bear Creek
Distance(s)	Approximately +/-10 km from Site to Bear Creek

Based on all available information and site knowledge, it is my opinion that:

Sampling and Monitoring Program Status:

1) The current surface water monitoring program continues to effectively characterize the surface water conditions, and includes data that relates upstream/background and downstream receiving water conditions:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
2) All surface water sampling for the monitoring period being reported was successfully completed in accordance with the Certificate(s) of Approval or relevant authorizing/control document(s) (if applicable):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.

Surface Water Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date

<p>3) a) Some or all surface water sampling and monitoring program requirements for the monitoring period have been established outside of a ministry C of A or authorizing/control document.</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable</p>	
<p>b) If yes, all surface water sampling and monitoring identified under 3 (a) was successfully completed in accordance with the established program from the site, including sampling protocols, frequencies, locations and parameters) as developed per the Technical Guidance Document:</p>	<p><input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Applicable</p>	<p>If no, specify below or provide details in an attachment.</p>
<p>Surface Water Sampling Location</p>	<p>Description/Explanation for change (change in name or location, additions, deletions)</p>	<p>Date</p>
<p>4) All field work for surface water investigations was done in accordance with standard operating procedures, including internal/external QA/QC requirements, as established/ outlined as per the Technical Guidance Document, MOE 2010, or as amended. (Note: A SOP can be from a published source, developed internally by the site owner's consultant, or adopted by the consultant from another organization):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, specify (Type Here):</p>

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

5) The receiving water body meets surface water-related compliance criteria and assessment criteria: i.e., there are no exceedances of criteria, based on MOE legislation, regulations, Water Management Policies, Guidelines and Provincial Water Quality Objectives and other assessment criteria (e.g., CWQGs, APVs), as noted in Table A or Table B in the Technical Guidance Document (Section 4.6):

- Yes
 No

If no, list parameters that exceed criteria outlined above and the amount/percentage of the exceedance as per the table below or provide details in an attachment:

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO

6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?

- Yes
 No

<p>7) All monitoring program surface water parameter concentrations fall within a stable or decreasing trend. The site is not characterized by historical ranges of concentrations above assessment and compliance criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)</p>
<p>8) For the monitoring program parameters, does the water quality in the groundwater zones adjacent to surface water receivers exceed assessment or compliance criteria (e.g., PWQOs, CWQGs, or toxicity values for aquatic biota (APVs)):</p>	<p><input type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input checked="" type="radio"/> Not Applicable</p>	<p>If yes, provide details and whether remedial measures are necessary (Type Here)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

Surface Water CEP Declaration:

I, the undersigned hereby declare that I am a Competent Environmental Practitioner as defined in Appendix D under Instructions, holding the necessary level of experience and education to design surface water monitoring and sampling programs, conduct appropriate surface water investigations and interpret the related data as it pertains to the site for this monitoring period.

I have examined the applicable Certificate of Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed the Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water Technical Guidance Document (MOE, 2010, or as amended) and associated monitoring and sampling guidance documents, as amended from time to time. I have reviewed all of the data collected for the above-referenced site for the monitoring period(s) identified in this checklist. Except as otherwise agreed with the ministry for certain parameters, all of the analytical work has been undertaken by a laboratory which is accredited for the parameters analysed to *ISO/IEC 17025:2005 (E)- General requirements for the competence of testing and calibration laboratories*, or as amended from time to time by the ministry.

If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the exception or potential concern and my client's proposed action have been documented in writing to the Ministry of the Environment District Manager in a letter from me dated:

Recommendations:

Based on my technical review of the monitoring results for the waste disposal site:

<p><input checked="" type="radio"/> No Changes to the monitoring program are recommended</p> <p><input type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	
<p><input checked="" type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	

CEP Signature		
Relevant Discipline	Professional Engineer	
Date:	18-Jan-20	
CEP Contact Information:	Mr. James Yardley, P.Eng.	
Company:	GHD	
Address:	455 Phillip St., Waterloo, Ontario N2L 3X2	
Telephone No.:	519-340-4265	
Fax No. :	519-884-0525	
E-mail Address:	Jim.Yardley@ghd.com	
Save As		Print Form



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