

2021 Annual Monitoring Report

Dymment's Creek Historical Landfills

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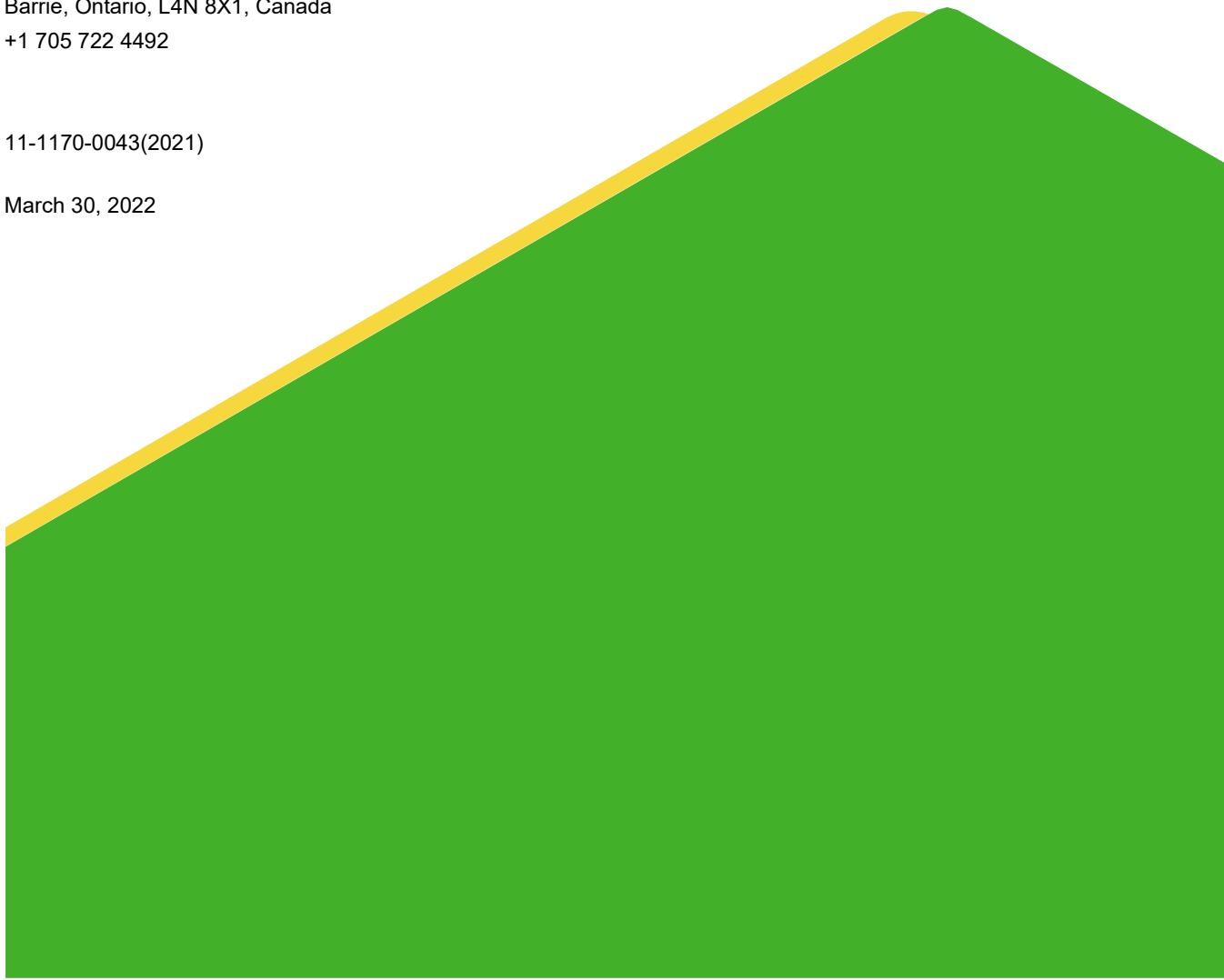
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Executive Summary

Golder Associates Ltd. (Golder) was retained by the City of Barrie (City), to carry out an Annual Monitoring Program for seven Historical Waste Sites located within the City of Barrie along Bunker's and Dymont's Creeks, located between Anne Street and Bradford Street, approximately 300 to 400 metres west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 3 and December 6, 2021 for the three waste disposal sites referred to as Sites 4, 5 and 6 located along Dymont's Creek (see Figures 1 and 2). Sites 1, 2, 3, and 7 are discussed in a separate report. This work program is intended to constitute an assessment relative to the potential changes to impact of the landfills and to report on the operation and monitoring of the landfill gas controls installed at Site 6 and monitored under Environmental Compliance Approval (ECA) No. 3118-BD5KTE, dated June 14, 2019.

The landfill sites are more or less continuous on both sides of Dymont's Creek (and herein referred to as the "Dymont's Creek Landfills"), and are bounded by Anne Street to the west, Bradford Street to the east, John Street to the north, and Brock Street to the south. In the area of Site 4, the available information indicates that the waste extends north of the creek and onto the private properties and south to the middle of the property occupied by an apartment building at 111 Sanford Street. The waste at Site 6 reportedly extends to the western limit of 113 John Street, but not as far as the building foundation and it is reported that waste may extend onto the southern portions of these properties. According to previous reports, waste extends onto the 15 Frederick Street property.

Parameters associated with impacts from municipal waste typically include elevated concentrations of chloride, sodium, metals including iron, manganese and phosphorous, nitrogen compounds including ammonia and low concentrations of chlorinated volatile organic compounds (VOC) from products co-disposed in the waste. The City implements a monitoring program to monitor the environmental conditions relative to surface water quality in Bunker's and Dymont's Creek and relative to the potential for explosive levels of soil-gas (i.e., the methane in landfill gas, LFG). The Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance. Standards for LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%).

A sheetpile cut-off wall and passive LFG venting system was constructed at Site 6 in 2020, located along the northern and northeastern perimeter of the City-owned property to prevent LFG from migrating from City-owned lands in the unsaturated soils above the water table. The operation of the venting system is regulated under ECA No. 3118-BD5KTE. Monitoring of the vents and wells beyond the cut-off wall at Site 6 is undertaken to confirm the system is operating as expected and to assess the potential risk posed to nearby residences from elevated methane in soil gas. There were no complaints received by the City relating to the operation of this system in 2021.

Based on the results of the 2021 Annual Monitoring Program, the following summary and conclusions are provided:

- Based on our review of previous calculated un-ionized ammonia concentrations, the total ammonia concentrations have not changed over time and the temperatures in the stream have remained relatively consistent over time (17 to 18°C in September). Water temperatures during May exhibited much lower values than in September, resulting in higher un-ionized ammonia concentrations during the Fall event.

- Concentrations of iron above the PWQO are observed in the area of the Dymont's Creek landfills. Elevated iron is typical of surface water quality throughout the City and is not considered to indicate landfill related impacts.
- The presence of elevated TCE at a location downstream from Site 6 in 2020 is considered to be from an off-site source and in 2021 returned to lower concentrations (below the PWQO of 20 µg/L). Continued semi-annual surface water sampling is recommended to gather data to assess if continued further actions are necessary relative to the closed landfills monitoring program.
- Based on the presence of methane in the Site 6 LFG venting pipes and the absence of methane in the gas probes outside of the cut-off wall, it is concluded that the LFG control measures are effective at controlling off-site migration of LFG from waste on the City-owned property at Site 6 to the adjacent residential areas.
- Modelling results using the 2021 monitored contaminants at the LFG venting system at Site 6 indicate that the system is in compliance with the predictions outlined as part of the ECA for the system.

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1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the City of Barrie (City), to carry out an Annual Monitoring Program for seven Historical Waste Sites located within the City of Barrie along Bunker's and Dymont's Creeks, located between Anne Street and Bradford Street, approximately 300 to 400 metres west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 3 and December 6, 2021 for the three waste disposal sites referred to as Sites 4, 5 and 6 located along Dymont's Creek (see Figures 1 and 2). Sites 1, 2, 3, and 7 are discussed in a separate report. This work program is intended to constitute an assessment relative to the potential changes to impact of the landfills and to report on the operation and monitoring of the landfill gas controls installed at Site 6 and monitored under Environmental Compliance Approval (ECA) No. 3118-BD5KTE, dated June 14, 2019.

Between 2011 and 2013, Golder conducted an assessment of nine Historical Waste Sites within the City, following the requirements of the Ministry of the Environment, Conservation and Parks (Ministry, MECP or precursors) D-4 Studies and of the Environmental Site Assessment process. The nine sites were part of an identified list of landfills in Ontario, developed by the Ministry on the basis of information largely collected in a 1979 study (Ministry of the Environment, 1979), supplemented with information available up to 1994 when the Ministry finalized the Waste Inventory. The locations of the landfills in Barrie were identified based on generalized street descriptions and were reported to be operated from 1956 to 1964, pre-dating the Ministry's Environmental Protection Act (1973). As these waste sites were largely "unorganized" (i.e., none of them were approved under a Ministry process) their exact locations and character were not known.

Following the initial studies, a total of seven landfills were identified, four located along Bunker's Creek and three located along Dymont's Creek. These landfills are located on lands currently developed as parkland, residential, commercial, and industrial land use.

The areas of waste fill have been identified and impact on the environment assessed on the basis of groundwater, surface water and soil gas standards. Whereas the sites largely contain inert fill, waste fill was identified at most of the landfills; key indicators of the impact of the waste fill were identified.

Parameters associated with impacts from municipal waste typically include elevated concentrations of chloride, sodium, metals including iron, manganese and phosphorous, nitrogen compounds including ammonia and low concentrations of chlorinated volatile organic compounds (VOC) from products co-disposed in the waste. A monitoring program was recommended to monitor the future environmental conditions at the landfills, largely relative to surface water quality in Bunker's and Dymont's Creek and relative to the potential for explosive levels of soil-gas (i.e., the methane in landfill gas, LFG). The Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance. Standards for LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%).

2.0 BACKGROUND

2.1 Historic Waste Site Investigations

Three Sites identified in the Ministry Waste Disposal Site Inventory within the City of Barrie are located adjacent to Dymont's Creek:

- Site 4 - Sanford Street and Brock Street: Located on the east side of Sanford Street, north of Brock Street - closed in 1961 – Ministry Site No. X 4104;
- Site 5 - Innisfil Street and Brock Street: Located between Innisfil Street and Sanford Street, north of Brock Street (known as Brock Park) – closed in 1962 – Ministry Site No. X 4105; and
- Site 6 - John Street and Innisfil Street: Located southwest of the intersection of Innisfil Street and John Street – closed in 1963 – Ministry Site No. X 4106.

The findings of the earlier investigations estimated the approximate areal extent of waste as illustrated on Figure 2. It is noted that the delineation of waste extent was limited to investigation sites accessible to the City (i.e., City owned lands). Access to the southern portion of Site 6, including south of 15 Frederick Street located on the south side of Frederick Street nearest the dead-end, was limited due to forest cover. Access to Site 4 was limited to the publicly owned adjacent road allowances.

The landfill sites are more or less continuous on both sides of Dymont's Creek (and herein referred to as the "Dymont's Creek Landfills"), and are bounded by Anne Street to the west, Bradford Street to the east, John Street to the north, and Brock Street to the south. In the area of Site 4, the available information indicates that the waste extends north of the creek and onto the private properties and south to the middle of the property occupied by an apartment building at 111 Sanford Street. The waste at Site 6 reportedly extends to the western limit of 113 John Street, but not as far as the building foundation and it is reported that waste may extend onto the southern portions of these properties. According to previous reports, waste extends onto the 15 Frederick Street property.

The material within the Dymont's Creek Landfills consists of coarse soil fill overlying thin layers of waste material. The identified waste consisted primarily of solid materials (e.g., glass, plastic, bricks and metal) considered to be relatively inert however, putrescible materials including animal hides were encountered in boreholes MW-D3, E2-6 (a previously drilled borehole located west of GP-D12), and GP-D5 in Sites 5 and 6. These waste materials were odorous and also contained black organic material. Industrial fabric was encountered at one location (borehole E2-6, west of GP-D12). The overall thickness of the waste ranges from 0.05 m at several locations to a maximum of 4.37 m. The maximum depth of waste extends to 7.87 metres below ground surface (mbgs), on the north side of Dymont's Creek, in the southwest portion of Site 6. With the exception of the area near borehole GP-D13 (Site 6), there is a minimum of 1.0 m of cover fill above the top of the waste and direct human contact with the identified waste material is not considered likely. Waste is located directly below the topsoil at GP-D13 and direct human contact with the waste in these areas of thinner cover is possible.

Landfill gas is generated by the decay of organic material typically contained in municipal waste and consists largely of methane and carbon dioxide. Landfill gas (as defined by the presence of elevated methane concentrations) is not present outside of Site 5, nor in the monitored areas surrounding Site 4, within the City-owned rights-of-way. This is based on the absence of detectable methane at locations GP-D15, GP-D16, GP-D17, GP-D19, GP-D7, former GP-D25 (subsequently abandoned) and former GP-D28 (abandoned). Additional investigations within the private properties on Site 4 would be required to confirm the presence and extent of LFG on Site 4;

Methane monitoring at a well installed for a D-4 study of at 168 Bradford Street, immediately northeast of this site indicated no LFG was present in 2018. No information has been provided on this well since that time.

2.2 Site 6 Investigations and Remedial Measures

The historical investigations of the Site 6 area and subsequent monitoring indicated that there is no detectable methane north of Site 6, in the John Street, Frederick Street and Robert Street Right of Way (outside of waste limits), at locations GP-D20 through GP-D24. Elevated concentrations of methane are regularly detected in the waste fill within Site 6.

The extent of LFG migration relative to some private residences in the area of Frederick Street is not known as waste is interpreted to extend onto these private properties. In order to address the risk that methane/LFG from waste on City lands may migrate off-site, the City constructed a passive venting system between October 2019 and June 2020 along the northern and northeastern perimeter of the City-owned Site 6 property. Design and construction of the Barrier and Passive Venting System was approved through Environmental Compliance Approval for Air (ECA Air) No. 3118-BD5KTE, dated June 14, 2019 (Appendix E).

The passive venting system consists of a 202 m long steel sheet-pile cut-off wall at the limits of City owned lands at the north and east sides of Site 6 (see Figure 2). The sheet pile depths range from 1 m to 2.8 m below ground, just below the estimated deepest level of the water table. A shallow (approximately 1.2 m deep) sand-filled vent trench is located two metres inside (landfill side) of the cut-off wall; a 150 mm diameter vent pipe is located within the trench, connected to a series of vertical vent poles (GVP1 to GVP3), which passively release LFG within the trench. The vent poles consist of a 6 m high hollow and tapered galvanized steel pole fitted with a 100 mm diameter wind turbine at the top founded on a concrete pier. The design for this system is outlined in Golder (2020b).

3.0 SCOPE AND FIELD INVESTIGATION METHODS

3.1 Monitoring Program

The 2021 monitoring program is listed below. Landfill gas monitoring is to be completed semi-annually including once under frozen ground conditions. Surface water samples are collected semi-annually, in the spring and the fall. The program was modified in 2020 to incorporate additional voluntary sampling of soil-gas monitors; the Gas Venting Pole (GVP) sampling was added to address Condition 2.2 of ECA No. 3118-BD5KTE.

Based on the presence of trichloroethylene (TCE) at SWD2 in September 2020, an additional surface water sampling event took place in spring 2021 to assist in assessment of TCE concentration trends.

Perimeter Landfill Gas Probes (outside of the waste fill)
GP-D7, GP-D15, GP-D16, GP-D17, GP-D19, GP-D20, GP-D21, GP-D22, GP-D23, GP-D24, GP-D26, and GP-D27
Landfill Gas Probes in Waste
GP-D1, GP-D2, GP-D3, GP-D8, GP-D13, and GP-D14
Gas Venting Poles (GVP)
GVP1, GVP2 and GVP3
Surface Water Sampling Locations
SWD1, SWD2, SWD3, SWD4, SWD5

Note: Shaded wells included to assess performance of the LFG controls at Site 6.

The following scope of work was implemented for the 2021 monitoring program.

- Measurement of water levels and landfill gas monitoring in February/March 2021 (frozen ground) and September/October 2021 at select locations;
- Surface water quality samples were collected at the five established surface water monitoring locations on May 10 and September 17, 2021;
- Analysis of the surface water samples for major ions and indicators, metals, polycyclic aromatic hydrocarbons (PAH), volatile organic compounds (VOC) and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4) during both sampling events; and,
- Semi-annual measurement of LFG concentrations in in February/March (frozen ground) and September/October 2021 at the perimeter landfill gas probes.. The GVP were monitored in February and December 2021.

3.2 Landfill Gas Sampling

A portable, high volume pump (10 L/min) was used to purge three times the volume of each gas probe prior to sampling; the wells were outfitted with a valve and cap to prevent atmospheric influence. Readings including the

relative concentrations of carbon dioxide (CO₂), methane (CH₄), and oxygen (O₂) were obtained from the gas probes using a calibrated GEM 2000 landfill gas monitor.

Table 5 provides a summary of LFG readings in the gas probes. Figure 5 provides a summary of methane gas concentrations in plan view. Concentrations of methane are typically higher under frozen ground conditions (i.e., in winter).

In some locations, groundwater was close to the top of the screens (i.e., 90% or more of the screen was saturated at GP-D1, GP-D3 [September 2021 only], GP-D13 and GP-D14). As a result, monitoring results at these locations in 2021 were not representative of the soil gas concentrations, as noted in Section 5.

Methane has not previously been detected in wells constructed outside the waste (i.e., to the immediate west or east of Site 4 and wells constructed at greater distances to the north and south in the John and Brock Street rights-of-way) but is consistently present in wells within the waste. Accordingly, the 2021 monitoring program at these sites was limited to the gas probes located outside the waste to assess migration toward adjacent properties, with the exceptions of those sampled as part of the GVP sampling in Site 6.

3.3 Gas Probe / Well Decommissioning

The monitoring wells and gas probes located within the waste on City-owned lands, and which are no longer monitored, should be checked annually to ensure they are in good condition (e.g., the surface casing is stable and locked). The City may wish to retain these wells in some areas where sampling may be required for future studies. If these wells are to be abandoned, they should be decommissioned by a licenced water well contractor. There were no wells/probes decommissioned in 2021.

3.4 Surface Water Sampling

Five surface water samples (SWD1 through SWD5) along Dymont's Creek were collected on May 10 and again on September 17, 2021 (see Figure 2 for sampling locations). No evidence of leachate seeps, including sheen or discolouration of the water column, within the areas next to the sampling locations. Golder also visually assessed the length of the creek from the bank during each sampling event and no visible leachate seeps (e.g., sheen or discolouration) were noted.

Samples were collected from downstream (SWD1) to upstream (SWD3) locations to prevent cross-contamination. To prevent spillage of preservatives and ensure collection of a representative sample, a clean, dry amber glass jar was used to collect each sample from the middle of the water column and was subsequently poured into laboratory supplied sampling containers. At the time of sampling, the surface water samples were placed in coolers with ice and subsequently submitted to the commercial analytical laboratory under chain-of-custody procedures. Each surface water sample was submitted for laboratory analysis of VOC, metals, PHC, PAH, and major ions and indicators. **Table 1** below provides a summary of the measured field parameters for the surface water samples submitted for laboratory analysis.

Table 1: Summary of Surface Water Sample Field Data – Dymont's Creek Landfills – 2021

Sample I.D.	Location Relative to Closed Landfills	Date	Field pH	Field Temp. (°C)	Field Cond. (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)
SWD1	Downstream	May 10	7.57	6.54	1066	18.21	289
		Sept. 17	8.91	17.82	1155	7.65	12.9
SWD2	Between Sites 5 and 6	May 10	7.91	7.26	1081	13.35	246.9
		Sept. 17	8.85	18.53	1152	7.83	-63.9
SWD3	Upstream	May 10	7.95	7.47	1076	10.76	268.9
		Sept. 17	9.01	19.27	1149	8.14	-8.8
SWD4	Site 5	May 10	7.34	7.11	1078	9.97	30.3
		Sept. 17	8.94	18.17	1155	7.77	47.0
SWD5	Site 6	May 10	7.97	7.45	1101	13.04	294.3
		Sept. 17	9.09	19.05	1145	7.91	68.0

Notes:

µS/cm = micro Siemens per centimetre
 mg/L = milligrams per litre
 mV = millivolts

3.5 Analytical Program

Golder retained the services of Bureau Veritas Laboratories of Mississauga, Ontario. Bureau Veritas is accredited by the Standards Council of Canada/Canadian Association of Environmental Analytical Laboratories (CAEAL) program. Analytical methods are reported by the laboratories on the Laboratory Certificates of Analysis provided in Appendix C.

Analytical methods are reported by the laboratories on the Bureau Veritas Laboratory Certificates of Analysis provided in Appendix C.

3.5.1 Quality Assurance/Quality Control

Relative Percent Difference (RPD) is calculated where results for both the original and duplicate samples are at concentrations of greater than five times the laboratory reportable detection limits (RDL). Field duplicate surface water samples with calculated RPD values greater than 50% are considered questionable.

The standard analytical methods and procedures used, as well as internal laboratory method blanks, duplicates and surrogate recoveries for organic analyses are also provided on the laboratory Certificates of Analysis provided in Appendix C.

The laboratory maintains in-house quality assurance/quality control (QA/QC) programs to govern sample analysis. Standard QA/QC protocols include the analysis of method blanks, matrix spikes and 10% replicates for each sample batch. In addition to the quality control employed by the laboratories, the following QA/QC samples were also submitted during the work program:

- Two surface water field duplicate samples (DUP-1, a duplicate of SW-D2 in May 2021, and SWD-DUP1, a duplicate of SW-D5 in September 2021) were submitted for analysis of analyzed parameters during the work program;
- One blind field blank sample was submitted for analysis of analyzed parameters in September 2021, collected during the September 2021 surface water sampling event; and
- Two trip blank samples were submitted for analysis of VOC only, in May and September 2021, during the surface water sampling events.

4.0 GROUNDWATER AND SURFACE WATER RESULTS

4.1 Groundwater Elevations and Flow

The interpreted groundwater flow direction in the area of the landfills is toward Dymont's Creek and ultimately to the east toward Lake Simcoe. As previously recommended by Golder, groundwater quality has not been monitored at the landfills since 2017.

A summary of groundwater elevations obtained from the on-site monitoring wells and gas probes is provided in **Table B-1** (Appendix B).

Groundwater elevations measured during the February 2021 sampling program ranged from 220.06 masl (at GP-D7) to 223.79 masl (at GP-D20).

Groundwater elevations measured during the September 2021 sampling program ranged from 220.08 masl (at GP-D7) to 223.80 masl (at GP-D20).

Figure 3 illustrates the groundwater flow direction based on the available information from the wells in this study in February 2021. Groundwater flow is interpreted to be easterly overall, but locally it flows to the topographic low formed by Dymont's Creek. At Site 4, shallow groundwater flow is interpreted to be toward Dymont's Creek, however, there are a limited number of monitoring locations in this area and a component of groundwater may flow north-easterly and potentially flows east to adjacent properties before discharging to Dymont's Creek northeast of monitoring well MW-D7. At Sites 5 and 6, shallow groundwater is interpreted to be toward Dymont's Creek. Groundwater originating from within the waste fill areas would not likely impact adjacent properties outside the estimated waste limits, as groundwater would flow away from these properties.

4.2 Analytical Results

Laboratory Certificates of Analysis for surface water are provided in Appendix C. The analytical results for surface water samples were compared to the respective PWQO for surface water and are summarized in **Tables 6 through 8** following the text of the report.

Surface water sample locations for which the analytical results exceed the various standards used for comparison are provided on Figure 4. Un-ionized ammonia concentrations are shown on Figure 4 as this parameter is present in waste and represents a potential impact to aquatic organisms.

4.2.1 VOC, Metals, Major Ions, PHC and PAH

Surface water quality in samples collected from five locations along Dymont's Creek (see Figure 2) met the PWQO for the analyzed parameters with the exceptions of the following:

- May 10, 2021:
 - **Iron at all sampling locations** ranging in concentration from 0.81 mg/L (SWD3 – Site 6) to 1.70 mg/L (SWD4 – located between Innisfil Street and Bradford Streets, Site 5), all greater than the PWQO of 0.3 mg/L; and,
- September 17, 2021:
 - **Iron at all sampling locations** ranging in concentration from 0.67 mg/L (SWD5 – located between John Street and Innisfil Street, Site 6) to 0.78 mg/L (SWD1 – located west of Bradford Street, Site 4), all greater than the PWQO of 0.3 mg/L; and

- **Un-ionized ammonia at all sampling locations** ranging in concentration from 0.052 mg/L (SWD3 – Site 6) to 0.11 mg/L (SWD1 – Site 4), greater than the PWQO of 0.02 mg/L.

It is noted that iron concentrations in Dymont's Creek upstream of the landfill sites exceeded the PWQO during both sampling events. In May 2021, the concentration of iron in the surface water sampling locations was higher than in September 2021 at the same locations. This is likely due to the elevated flow and the associated increased sediment content. Whereas somewhat higher concentrations of iron are observed at the downstream sampling location SWD1 (0.78 mg/L), the landfills are not appreciably impacting the quality of the creek.

Ammonia, a common landfill indicator, was present at low concentrations within the stream samples, ranging from 0.14 to 0.60 mg/L in May and 0.15 mg/L to 0.42 mg/L in September 2021, consistent with previous results (concentrations ranging between 0.07 mg/L to 0.86 mg/L between 2012 and 2020). The un-ionized ammonia proportion, calculated based on field pH and temperature, ranged from 0.003 mg/L (SWD3) to 0.014 mg/L (SWD1), below the PWQO of 0.02 mg/L in May 2021.

In September 2021, un-ionized ammonia ranged from 0.007 mg/L (SWD5 – Site 6) to 0.019 mg/L (SWD1 – Site 4), below the PWQO of 0.02 mg/L which is slightly higher than in May 2021. Based on our review of previous calculated un-ionized ammonia concentrations, the total ammonia concentrations have not changed over time and the temperatures in the stream have remained relatively consistent over time (17 to 18°C in September). Water temperatures during May exhibited much lower values than in September, resulting in higher un-ionized ammonia concentrations during the Fall event.

In 2020, there was an increased concentration of TCE at SWD2 (37 µg/L) compared to concentrations historically detected at this location; only one reported historical value was above the detection limit (0.52 µg/L in 2019). Low but detectable concentrations of TCE were detected at downstream locations SWD4 and SWD1 including in 2020 (3.6 and 2.9 µg/L, respectively). TCE was not detected in the upstream sample location (SWD3) in 2020 and thus it was interpreted that this parameter may originate from baseflow discharge in the area of Site 6. The presence of TCE associated with off-site sources to the west of the Dymont's Creek Landfills is a known issue and is not part of the scope of this report. The TCE in the stream is considered to be most likely related to these upgradient sources.

In 2021, SWD2 TCE was detected at concentrations of 0.48 (0.51 µg/L in the duplicate sample) in May 2021 and 1.5 µg/L in September 2021. Low concentrations of TCE continued to be detected at downstream locations SWD4 and SWD1 in 2021 (ranging between 3.6 to 5.3 µg/L and 2.9 and 4.5 µg/L, respectively). The 2021 concentrations were below the PWQO of 20 µg/L. No detectable concentrations of TCE were reported in the upstream sample, SWD3, in 2020 or 2021. Continued semi-annual surface water sampling is recommended to gather data to assess if continued further actions are necessary relative to the closed landfills monitoring program. There is a known TCE plume in the upper aquifer upgradient of this creek, where detectable concentrations of TCE are present. Based on the groundwater flow (Figure 3), a portion of the TCE plume may discharge to Dymont's creek in the areas of Site 6 and is not believed to be related to the closed landfills.

Surface water is the ultimate receptor for potential groundwater impacts from the historical landfills. Based on the surface water results obtained during this investigation during the May and September 2021 sampling event, it is concluded that the landfills are not adversely effecting surface water quality of Dymont's Creek. Whereas some exceedances are noted for iron and the presence of TCE continues, the relative trends are not considered to represent an immediate issue requiring action beyond ongoing sampling and assessment described herein.

4.2.2 Indicator Parameters

In the absence of a PWQO, relative comparisons can be made regarding general water quality for parameters such as electrical conductivity (1,200 to 1,700 $\mu\text{S}/\text{cm}$) and chloride (220 to 340 mg/L), consistent across all sampling locations, however, generally higher in May than in September in 2021, which is likely indicative of higher baseflow from road salt applied along the adjacent roadways. The concentrations of the indicator parameters are similar in all surface water samples. This indicates that the landfills have minimal impact on Dymont's Creek.

4.2.3 Quality Assurance/Quality Control

Based on a comparison between the laboratory and field pH readings in September 2021, it has been determined that the elevated field pH readings were inaccurate. Whereas the pH meter was calibrated prior to sampling, the meter was not providing accurate results in the field.

Blind field duplicate surface water samples were collected during the 2021 work program from SWD2 in May 2021 and from SWD5 in September 2021. Concentrations of VOC, PHC and PAH parameters were less than the laboratory RDL and RPD values could therefore not be calculated. For detectable metal and inorganic parameters, RPD values for field duplicate samples, where calculable, were less than 14% and are therefore considered acceptable.

Concentrations of analyzed parameters in the trip blank and field blank samples were less than their respective laboratory detection limits, except for total aluminum (0.034 mg/L) and chloroform (4.1 $\mu\text{g}/\text{L}$) in the field blank prepared in September 2021. There are no PWQO for these parameters. Total aluminum concentrations in the analyzed surface water samples in 2021 remained consistent with previous sampling events. Chloroform was not detected in the samples collected in 2021. The presence of chlorogorm in the field blank was reviewed with Bureau Veritas Laboratories who were unable to identify a potential source of the chloroform in the laboratory. The presence of these parameters in the field blank sample does not significantly alter the findings of this investigation.

Surrogate standard recoveries outside the range, typically, of 50 to 130% are indicative of questionable results for the tested parameters. The reported surrogate recoveries were within the acceptable range, except for D8-Acenaphthylene (6.3%), which is below the acceptable range; however, the lab reported the overall quality control for this analysis meets acceptability criteria and are considered acceptable on this basis.

Matrix spike recoveries outside the typical range for individual parameters are indicative of questionable results for the tested parameters. The reported matrix spike recoveries are within the acceptable range, except for several PAH parameters, including acenaphthene (36%), acenaphthylene (32%), anthracene (43%), benzo(a)pyrene (37%), 2-methylnaphthalene (45%), and perylene (44%) in May 2021. The laboratory reported that although the recovery for these parameters are outside control limits, the overall quality control for these analyses met acceptability criteria. There were no detectable concentrations of these PAH parameters in the analyzed surface water samples and as such, the lower PAH recovery does not significantly alter the findings of this investigation.

Based on the above, the associated analytical results generally appear to be representative and reproducible.

5.0 LANDFILL GAS

Figure 5 provides a summary plan-view of the highest methane gas concentrations at monitored landfill gas probe locations at the Dymont's Creek Landfills, measured in February/March 2022 (under frozen ground conditions). Concentrations of methane gas above the LEL represent a potential safety hazard at adjacent buildings, as methane within the soil can potentially accumulate within enclosed spaces and result in conditions where open flame or a spark could cause an explosion.

Table 2 below provides a summary of 2021 methane gas concentrations recorded under frozen ground conditions. Data from the winter (February) 2021 is also included for gas probes located immediately outside of the cut-off wall (i.e., GP-D8, D20 and D23); monitoring of these monitoring locations relative to the LFG control system is further discussed in Section 6. Historical results, up to and including 2021, are provided on **Table 5** following the text of the report.

Results from the 2021 sampling program are provided in the table below to support the findings of this report.

Table 2: Summary of 2021 Methane Concentrations - Dymont's Creek Landfills

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)
Site 4					
GP-D7	0.76 - 2.29	Sand and gravel	3-Feb-21	2.05	CH ₄ = 0.0
			20-Sep-21	2.03	CH ₄ = 0.0
GP-D26	1.07 – 4.12	Sand, trace to some gravel, trace silt (FILL), overlying sand	3-Mar-21	2.86	CH ₄ = 0.0
			17-Sep-21	2.79	CH ₄ = 0.0
GP-D27	0.91 – 3.96	Sand, some gravel, trace silt (FILL) to sand and gravel, some silt, trace asphalt debris (FILL), overlying sand	3-Mar-21	2.48	CH ₄ = 0.0
			17-Sep-21	2.46	CH ₄ = 0.0
Site 5					
GP-D15	0.61 – 2.14	Surficial cover overlying sand	3-Feb-21	2.14	CH ₄ = 0.0
			17-Sep-21	2.14	CH ₄ = 0.0
GP-D16	1.22 – 2.74	Fine Sand, trace gravel	3-Feb-21	2.31	CH ₄ = 0.0
			17-Sep-21	2.24	CH ₄ = 0.0
GP-D17	0.99 – 2.51	Sand, some gravel, trace silt, (FILL) overlying sand, some silt	3-Mar-21	2.21	CH ₄ = 0.0
			17-Sep-21	2.15	CH ₄ = 0.0
GP-D19	1.22 – 2.74	Sand	3-Feb-21	2.75	CH ₄ = 0.0
			17-Sep-21	2.75	CH ₄ = 0.0

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)
Site 6					
GP-D1	1.53 – 3.05	Waste	3-Feb-21	1.65	CH ₄ = 0.1
			17-Sep-21	1.70	CH ₄ = 0.0
GP-D2	1.52 – 3.05	Construction debris (asphalt) and sand fill	3-Feb-21	2.42	CH ₄ = 3.3
			17-Sep-21	2.40	CH ₄ = 0.0
GP-D3**	0.31 – 1.83	Surficial cover overlying waste	3-Feb-21	0.83	CH ₄ = 34.3
			17-Sep-21	0.41	CH ₄ = 12.5
GP-D8	1.53 – 3.05	Sand fill overlying waste	3-Feb-21	1.94	CH ₄ = 0.0
			17-Sep-21	1.96	CH ₄ = 0.0
GP-D13**	0.46 – 1.98	Waste	3-Feb-21	0.35	CH ₄ = 10.0
			17-Sep-21	Not measured	CH ₄ = 10.3
			6-Oct-21	0.34	CH ₄ = 22.2
GP-D14	1.52 – 3.05	Silty sand to fine sand (FILL)	3-Feb-21	1.59	CH ₄ = 0.8
			17-Sep-21	1.41	CH ₄ = 0.2
GP-D20	1.37 – 4.42	Sand, trace silt, trace organics (FILL), overlying sand	3-Feb-21	3.45	CH ₄ = 0.0
			17-Sep-21	3.45	CH ₄ = 0.0
GP-D21	1.22 – 4.27	Sand, trace gravel, trace silt, trace rootlets (FILL), overlying sand	3-Feb-21	3.38	CH ₄ = 0.0
			17-Sep-21	3.28	CH ₄ = 0.0
GP-D22	1.52 – 4.57	Sand, some gravel, trace silt (FILL), overlying sand	3-Mar-21	3.93	CH ₄ = 0.0
			17-Sep-21	3.86	CH ₄ = 0.0
GP-D23	0.91 – 3.96	Sand, some gravel, trace silt, trace asphalt debris (FILL), overlying sand	3-Mar-21	2.93	CH ₄ = 0.0
			17-Sep-21	2.68	CH ₄ = 0.0
GP-D24	2.44 – 5.49	Sand, some gravel, trace silt (FILL), overlying sand	3-Mar-21	4.04	CH ₄ = 0.0
			17-Sep21	3.99	CH ₄ = 0.0
Notes: CH4 = methane CO2 = carbon dioxide O2 = oxygen ** Headspace methane concentration is greater than 5% by volume, the lower explosive limit of methane. Water level tape broke at GP-D13; remeasured in October.					

Elevated methane was not detected at the gas probes located adjacent to Sites 4, 5 and 6. This is consistent with recent historical results for these locations.

Methane was not detected at any of the residential locations adjacent Site 6 to the north (i.e., GP-D20 through GP-D24) or at GP-D8 located on the northern edge of the fill area south of John Street. Low but detectable concentrations of methane are consistently measured at GP-D14, located on the eastern edge of the fill area of Site 6. The water table at GP-D14 is typically found at a depth of approximately 1.5 m below grade, at or near the top of the gas probe screen. When the screen is most exposed (i.e., when the water table declines to its lowest levels), the methane concentration is at or near the Lower Explosive Limit.

In September 2021, GP-D13, Golder noted a bubbling in the water column which is considered to be associated with degassing of the well. The bubbling quickly dissipated after the well was opened as the pressure within the well equilibrated with atmospheric pressure. Golder was also not able to collect a water level at GP-D13 during the September 17, 2021 sampling event due to a damaged water level tape. The water level measured on October 6, 2021 was consistent with past water levels; the LFG readings were also within historical normal ranges. The bubbling was also noted in October but dissipated relatively quickly once the well was opened. The condition of the well is not notably different based on visual observation. The noted bubbling is presumed to reflect higher soil-gas pressures, however there are no accompanying evident trends of water levels or methane concentrations.

6.0 PASSIVE VENTING SYSTEM MONITORING

Section 6 of this annual report satisfies the requirements outlined in Condition 2.2 of the ECA No. 3118-BD5KTE, which requires the annual report to include:

- the frequency of monitoring adopted;
- the concentration of contaminants discharging in the air;
- the wind speeds and wind directions recorded at the time of monitoring; and
- the results of dispersion calculations, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to air.

There were no complaints received by the City relating to the operation of this system in 2021. No repairs or maintenance of the system was undertaken.

6.1 Summary of Gas Monitoring Well Results

Performance of the passive venting and cut-off wall LFG control measures installed at Site 6 is, in part, assessed through monitoring of the gas probes located immediately outside of the cut-off wall (i.e., GP-D8, D20 and D23). Results from these locations in the winter of 2020, prior to construction of the LFG control measures, indicated there was no methane present at any of these locations. This is similarly the case for the recorded methane concentrations following construction of the LFG control measures, including the winter (February/March) and fall (September) of 2021 at all three probes. The results indicate that off-site migration of methane in soil-gas from the landfill on City-owned lands in Site 6 is not occurring.

Sampling of the landfill gas probes within the waste at Site 6 in 2021 indicated results consistent with historical data collected at this Site. Elevated concentrations of methane are noted at GP-D3 (12.5% to 34.3%) and GP-D13 (10.0% to 22.2%). These concentrations are greater than those reported in 2020 but are consistent with those reported in previous years. This is consistent with the expected elevated concentrations of methane within waste materials of this age. Following the completion of the 2022 monitoring program, it is recommended that the potential for reduction of the sampling program relative to the LFG control measures at Site 6 be evaluated.

6.2 Summary of Passive Gas Vent System Monitoring Results

A semi-annual monitoring frequency is required at the three gas venting poles (GVP1 to GVP3); one of the monitoring rounds is completed under frozen ground conditions (February/March). As part of the gas vent monitoring completed at the Site in 2021, methane (%LEL and %CH₄), carbon dioxide (% volume) and oxygen (% volume) and flow rates were recorded.

A summary of the gas probe monitoring is provided in **Table 3** below. The methane, carbon dioxide and oxygen readings were recorded using a calibrated GEM 5000. Flow rate of landfill gas venting upward within the vent system poles were measured using a VelociCalc ventilation meter. The methane readings measured in the GVP were between 0.0 % to 0.2% by volume. The maximum reading of 0.2% was reported at GVP2 on December 6, 2021.

Table 3: Summary of 2021 Gas Venting Pole Monitoring

Location	Date	CH ₄ (% volume)	CO ₂ (% volume)	O ₂ (% volume)	Flow Rate (cfm)
GVP1	4-Feb-21	0.1	3.1	17.1	4.0
	6-Dec-21	0.0	0.3	20.0	5.6
GVP2	4-Feb-21	0.0	1.7	18.6	4.7
	6-Dec-21	0.2	1.4	19.0	6.4
GVP3	4-Feb-21	0.0	0.2	20.7	6.1
	6-Dec-21	0.0	0.2	20.9	6.7

6.3 Landfill Gas Passive Vent Sampling Results

Samples were collected semi-annually from all GVP (GVP1 through GVP3) on February 4 and December 6, 2021. Samples were analyzed for methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and VOC. Gas samples were collected in Tedlar bags using a lung box apparatus with a Gilair™ pump and submitted to Bureau Veritas Laboratories for analysis. Due to an equipment shortage related to supply issues associated with the Covid-19 pandemic, Bureau Veritas Laboratories only had 2 Tedlar bags that were used for sampling VOC. Two additional Tedlar bags were provided by Maxim Environmental; one was used to collect the VOC sample at GVP3 and the second was used as a laboratory blank. These sample results were used to update the emission rates and maximum predicted off-site concentrations. Laboratory Certificates of Analysis for the gas venting pole samples are provided in Appendix C. A summary of the landfill gas chemistry results is provided in **Table F-1** (Appendix F).

6.4 Summary of Wind Speed and Direction

Meteorological data was taken from Environment Canada for the Barrie-Oro DDD (Station Number 6117700, available: climate.weatheroffice.gc.ca/climateData/canada_e.html; accessed: January 18, 2022). This station is located approximately 20 kilometres (km) north of the Site. This weather station is considered to be adequate to represent Site weather conditions during the sampling periods. A summary of the weather conditions (precipitation, temperature, wind direction and average wind speed) during the semi-annual sampling events is provided in **Table 4** below.

Table 4: Summary of 2021 Weather Conditions during Gas Venting Pole Monitoring

Date	Time	Temperature (°C)	Barometric Pressure (kPa)	Wind Speed (km/h)	Wind Direction (°)
February 4	1:00pm	0.0	97.75	8	180
	2:00pm	1.2	97.70	7	150
	3:00pm	1.2	97.56	11	130
	4:00pm	1.0	97.49	7	130
	5:00pm	-1.0	97.37	7	110

Date	Time	Temperature (°C)	Barometric Pressure (kPa)	Wind Speed (km/h)	Wind Direction (°)
December 6	12:00pm	2.7	96.33	25	270
	1:00pm	2.7	96.32	19	270
	2:00pm	1.9	96.39	27	260
	3:00pm	1.5	96.43	26	260
	4:00pm	0.9	96.53	30	260

6.5 Concentrations of Contaminants Discharging to Air

An Emission Summary and Dispersion Modelling (ESDM) report (Golder, 2019) was originally prepared in 2019 as part of an application for an Environmental Compliance Approval (ECA) for emissions to air under Section 9 of the Environmental Protection Act. Condition 2.2 of the ECA states that the emission calculations and dispersion modelling used to support this ESDM are to be updated annually using the results of the monitoring completed in the previous calendar year, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05. A summary of the methodology and results used to update the emission calculations and modelling with 2021 sampling data are included in the following section.

6.5.1 Gas Venting Poles

Emission rates of landfill gas constituents released through the passive vent poles were calculated using the maximum measured concentration (ppb or µg/m³) of each contaminant in any of the vents during each sampling round (**Table F-1**) and the average volumetric flow rate (m³/s) to determine an emission rate (g/s). Average flow rate for each vent, is provided in **Table 3**. The equations used to calculate the emission rates are provided below:

$$Concentration \left(\frac{\mu g}{m^3} \right) = Concentration (ppb) \times MW \left(\frac{g}{mol} \right) \times R \left(\frac{m^3 atm}{mol K} \right) \times T (K) \times \frac{1}{p(atm)} \times \frac{1 ppm}{1000 ppb}$$

Where:

- MW = Molecular Weight at 25°C and 1 atmosphere
- R = Ideal gas constant
- P= atmospheric pressure (atm)
- T = Temperature (K)

$$Emission Rate \left(\frac{g}{s} \right) = Concentration \left(\frac{\mu g}{m^3} \right) \times volumetric flow rate \left(\frac{m^3}{s} \right) \times \frac{1g}{1000000 \mu g}$$

The purpose of the passive vent sampling is to provide further understanding of the concentrations of the contaminants discharging to air and to confirm that the assessment completed as part of the 2019 ESDM Report (Golder, 2019) does not underestimate the predicted off-site air quality impacts from the passive venting system.

Sampling was completed for the analytical laboratory standard suite of 66 Volatile Organic Compounds (VOC) over the course of 2021. This list of VOC includes many contaminants common to landfill gas including for example, vinyl chloride. Of these 66 compounds, 23 compounds were sampled at concentrations greater than the

detection limit for at least one vent and during at least one sampling round. For contaminants that were not found at concentrations greater than the detection limit, emission rates were calculated using a concentration equal to the detectable limit for that compound. The detailed emission rate calculations are included in **Appendix F**.

An updated Source Summary Table of all emissions from the venting poles is included in **Table F-3**.

6.6 Dispersion Modelling

Dispersion modelling was conducted in accordance with the MECP publication “*Guideline A-11: Air Dispersion Modelling Guideline for Ontario, Version, 3.0*”, dated February 2017 (ADMGO) PIBS 5165e03.

Compliance was assessed using the AERMOD dispersion modelling system and s.20 standards guidelines.

The AERMOD modelling system is made up of the AERMOD dispersion model, the AERMET meteorological pre-processor, the AERMAP terrain pre-processor and the BPIP building downwash pre-processor. The AERMET pre-processor was not used in this assessment, however the most current version of the appropriate pre-processed MECP meteorological dataset was used.

The following is a list of the model and pre-processors which were used in this assessment, along with the version numbers:

- AERMOD dispersion model (v. 19191)
- AERMAP surface preprocessor (v. 18081)

The emission rates used in the dispersion model were calculated as described in Section 6.5. These emission rates are further described in the Emission Rate Calculations provided in Appendix F.

6.6.1 Dispersion Modelling Input Summary Table

The passive venting system was modelled using the source parametrization in the 2019 ESDM report (Golder, 2019), with the exception of the flow rates for the vent poles that were updated to reflect the 2021 measured data. Maximum ground level concentrations were predicted at and beyond the property line.

As per the 2019 ESDM report (Golder, 2019), one modelling run was completed for the vent poles.

An updated Dispersion Modelling Source Summary Table is provided as **Table F-4**. Copies of the dispersion modelling files are provided in **Appendix F**.

6.6.2 Meteorology, Surrounding Land Use and Terrain

In this assessment, the AERMOD model was run using a Ministry pre-processed five-year dispersion meteorological dataset (i.e., surface and profile files), last updated in 2018, in accordance with paragraph 1 of s.13(1) of O.Reg.419/05. As the Landfill is located in the MECP Central Region, the meteorological data set for Toronto is used. Furthermore, the land use surrounding the Facility is characterized as urban and therefore the “Urban” meteorological dataset is used.

Terrain data used in this assessment was obtained from the Ministry. The Canadian Digital Elevation Model (CDEM) data in GeoTIFF format used in this assessment is: ‘cdem_dem_031D.tif’.

6.6.3 Receptors

Receptor locations are consistent with the 2019 ESDM report (Golder, 2019).

6.6.4 Averaging Periods and Conversions

Section 20 of O. Reg. 419/05 applies to this Landfill. Many of these standards and guidelines are based on 1-hour and 24-hour averaging times, which are averaging times that are easily provided by AERMOD. In cases where a standard and/or guideline has an averaging period that AERMOD is not designed to predict (e.g., ½-hr or 30-day), a conversion to the appropriate averaging period was completed using the MECP recommended conversion factors, as documented in the ADMGO and the MECP *Technical Bulletin Methodology for Modelling Assessments with 10-Minute Average Standards and Guidelines under O. Reg. 419/05*, dated April 2008.

6.6.5 Dispersion Modelling Options

The options used in the AERMOD dispersion model are summarized in the table below.

Modelling Parameter	Description	Used in the Assessment?
DFAULT	Specifies that regulatory default options will be used	Yes
CONC	Specifies that concentration values will be calculated	Yes
AVERTIME	Time averaging periods calculated	1-hr, 24-hr, Annual

6.7 Maximum Predicted Concentrations

The POI concentrations listed in the updated Emission Summary Table (**Table F-5**), were compared against the applicable s.20 standards and guidelines listed as Benchmark 1 in the *Air Contaminants Benchmark (ACB) List*, dated April 2018 (List of Ministry POI Limits).

Contaminants released by the Facility that do not have Benchmark 1 standards or guidelines in the ACB List are considered to be 'Contaminants with No MECP POI Limits'. Where applicable, predicted POI concentrations of 'Contaminants with No MECP POI Limits' were screened against the Benchmark 2 screening levels in the ACB List or the *de minimus* limit. Predicted concentrations of all 'Contaminants with No MECP POI Limits' were found to be below the corresponding Benchmark 2 screening level or *de minimus* limit.

Based on the results of modelling the 2021 monitored contaminants, the predicted concentrations of all the contaminants with MECP POI limits were less than 1% of their corresponding POI limits and less than the predicted concentrations identified in the 2019 ESDM report (Golder, 2019) thus illustrating that the assumptions used in the 2019 ESDM report (Golder, 2019) do not underestimate emissions from the passive venting system and the Site is operating in compliance with Ontario Regulation 419/05. Condition 2.3 of the ECA Air No. 3118-BD5KTE states that upon submission of the third annual report for the passive venting system (i.e., the 2022 Annual Monitoring Report), the City may amend the monitoring requirements with approval from the District Manager.

7.0 SUMMARY AND DISCUSSION

7.1 Surface Water Quality

Ammonia, a common landfill indicator, was present at low concentrations within the stream samples, ranging from 0.14 to 0.60 mg/L in May and 0.15 mg/L to 0.42 mg/L in September 2021, consistent with previous results (concentrations ranging between 0.07 mg/L to 0.86 mg/L between 2012 and 2020). The un-ionized ammonia proportion, calculated based on field pH and temperature, ranged from 0.003 mg/L (SWD3) to 0.014 mg/L (SWD1), below the PWQO of 0.02 mg/L in May 2021.

In September 2021, un-ionized ammonia ranged from 0.007 mg/L (SWD5 – Site 6) to 0.019 mg/L (SWD1 – Site 4), below the PWQO of 0.02 mg/L; however, slightly higher than in May 2021. Based on our review of previous calculated un-ionized ammonia concentrations, the total ammonia concentrations have not changed over time and the temperatures in the stream have remained relatively consistent over time (17 to 18°C in September), although the May event had much lower creek temperatures than the September event, which is likely the reason for the lower un-ionized ammonia concentrations during the Spring event.

Concentrations of iron above the PWQO is typical of surface water quality throughout the City and are not considered to indicate landfill related impacts. In May 2021, the concentration of iron in the surface water sampling locations was higher than in September 2021 at the same locations. This is likely due to the elevated flow and the associated increased sediment content. Whereas somewhat higher concentrations of iron are observed at the downstream sampling location SWD1 (0.78 mg/L), the landfills are not appreciably impacting the quality of the creek.

The presence of elevated TCE at a location downstream from Site 6 in 2020 was considered to be from an off-site source and in 2021 returned to lower values (below the PWQO of 20 µg/L). Further evaluation of data collected in 2022 will be completed to determine if additional steps are required.

Surface water is the ultimate receptor for potential groundwater impacts from the historical landfills. Based on the surface water results obtained during this investigation during the May and September 2021 sampling event, it is concluded that the landfills are not adversely effecting surface water quality of Dymen's Creek. Whereas some exceedances are noted for iron and the presence of TCE continues, the relative trends are not considered to represent an immediate issue requiring action beyond ongoing sampling and assessment described herein.

7.2 Off-Site Landfill Gas Monitoring

Methane was not detected in wells constructed surrounding Site 4. As noted in earlier reporting (Golder, 2013), there are historical data and reports indicating that evaluation of LFG with the area of Site 4 was completed, however conditions within the waste or the adjacent building have not been confirmed on these private lands.

Elevated methane (i.e., above 1%) is not present within gas probes located adjacent to Site 5. The results of the available data are similar to historical observations.

Elevated methane (i.e., above 1%) is not present within gas probes located adjacent to Site 6. The results of the available data are similar to historical observations. As discussed in Section 7.3, the LFG control measures installed by the City at Site 6 are considered to be managing impacts from waste on the City property.

The waste has been in place at these landfill sites for over 50 years and therefore LFG generation is expected to decline slowly. Provided that other controlling conditions at or near the waste fill areas, for example water table

elevation, permeability of the soil cover, etc. do not change, off-site methane concentrations are expected to remain within the range of recent results.

7.3 Site 6 Landfill Gas Controls

A cut-off wall and passive venting system were constructed as LFG control measures at Site 6 in 2021 and are permitted under ECA 3118-BD5KTE. These measures are located along the northern and northeastern perimeter of the City-owned property.

Elevated methane concentrations are present within the waste in 2021 at concentrations of up to 34.3% (GP-D3), consistent with earlier results. No methane was detected at the probes outside of the cut-off wall (i.e., at GP-D8, D-20 and D-23). Monitoring at the three gas vent poles (GVP1 to GVP3) in February and December 2021 indicated methane concentrations of between 0.0 % to 0.2% by volume.

The maximum predicted concentrations from dispersion modelling of the vent stack data were below the relevant air quality criteria and less than the maximum predicted concentrations identified in the 2019 ESDM report that supports the ECA. This illustrates that the assumptions used in the 2019 ESDM report provide a conservative assessment of emissions from the passive venting system, which is operating in compliance with the ECA.

Based on the presence of methane in the venting pipes and the absence of methane in the gas probes outside of the cut-off wall, it is concluded that the LFG control measures at Site 6 are effective at controlling off-site migration of LFG from waste on the City-owned property to the adjacent residential areas. The requirement for monitoring of the passive venting system should be evaluated following the 2022 monitoring program.

8.0 LIMITATIONS

This report was prepared for the exclusive use of the City of Barrie and has been prepared as part of environmental due diligence activities and is not intended to be utilized as supporting documentation for a Record of Site Condition under Ontario Regulation 153/04.

Golder's professional services for this assignment addressed only the geo-environmental (chemical) aspects of the subsurface conditions at this Site. Any geotechnical (physical) aspects, including engineering recommendations for the design and construction of building foundations, pavements, underground servicing and the like are outside the terms of reference for this report and have not been investigated or addressed.

This report is based on data and information collected during the subsurface environmental investigations conducted by Golder and is based solely on-site conditions encountered at the time of the field work (i.e., 2021), as described in this report.

In evaluating the Site, Golder has relied in good faith on information provided by others and evaluated only conditions at a limited number of test locations. Only limited chemical analyses of soil samples were carried out. It should be noted that the results of an investigation of this nature should, in no way, be construed as a warranty that the Sites are free from any and all contamination from past or current practices.

We accept no responsibility for any deficiency, misstatements or inaccuracies contained in this report as a result of omission, misinterpretations or fraudulent acts of the persons interviewed. Golder accepts no responsibility for any reduction in property value, either real or perceived, as a result of the reporting of factual information herein.

This assessment was carried out using existing historical information as available from various agencies and no assurance is made regarding the accuracy or completeness of this information.

If additional information is obtained during future work at the sites, including excavations, borings, or other studies, and/or if conditions exposed during construction are different from those encountered in this assessment, Golder should be requested to re-evaluate the conclusions presented in this report and provide amendments as required.

Signature Page

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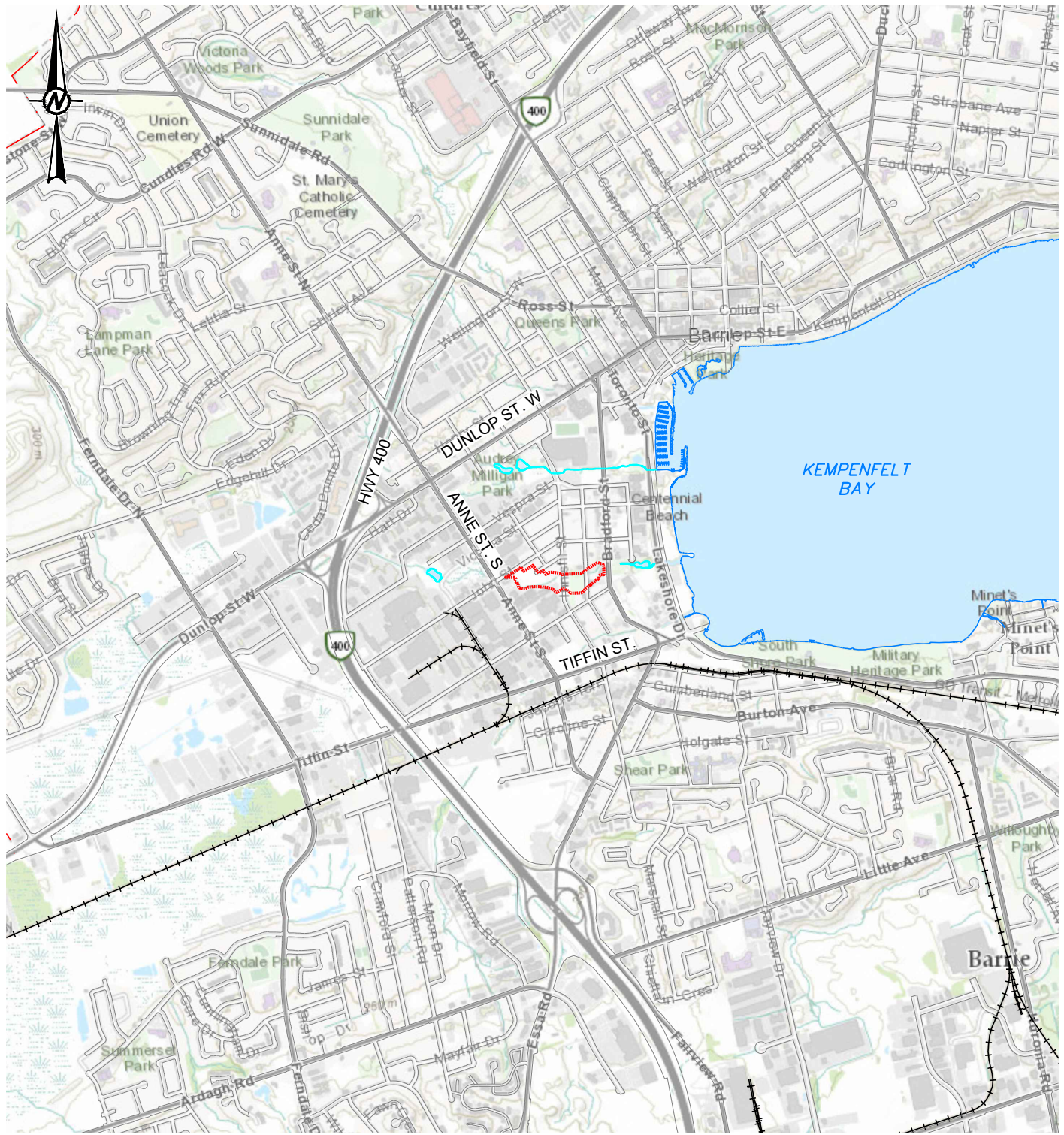
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9.0 REFERENCES

The following references were reviewed for the purposes of preparing this report:

- By-Law No. 2009-141. The Corporation of the City of Barrie Comprehensive Zoning By-Law, August 10, 2009. Map last updated January 2011.
- Golder Associates Ltd., 2013. *D-4 Study and Environmental Assessment – Final Report, Dymont’s Creek Landfills, City of Barrie*. Report prepared for the City of Barrie, dated April 2013.
- Golder Associates Ltd., 2014. *Supplemental Environmental Investigations – Final Report, City of Barrie Dymont’s Creek Historical Landfills*. Report prepared for the City of Barrie, dated September 2014.
- Golder Associates Ltd., 2019. *Emission Summary and Dispersion Modelling Report*. Report prepared for the City of Barrie, dated March 6, 2019.
- Golder Associates Ltd., 2020. *Site 06 Historic Landfill – Passive Landfill Gas Barrier / Venting System*. As-built drawings prepared for the City of Barrie, dated June 18, 2020.
- Golder Associates Ltd., 2021a. *Dymont’s Creek Landfill - 2020 Annual Monitoring Program Report*. Report prepared for the City of Barrie, dated March 22, 2021.
- Golder Associates Ltd., 2021b. 2020 VOC Plume Monitoring Program, City of Barrie. Report prepared for the City of Barrie, dated March 2021.
- Ministry of Environment, Conservation and Parks, 2011. *Soil, Groundwater, and Sediment Standards, Part XV.1 Environment Protection Act*, dated April 15, 2011.
- Ministry of Environment and Energy, 1994. *Provincial Water Quality Objectives*, dated July 1994.

FIGURES



 D4 Assessment Area

NOTES:

1. Datum is NAD UTM 83 Zone 17
2. Mapping Based on County of Simcoe Municipal Base
3. 500 m Offset D4 Assessment as per City of Barrie 2009 Official Plan



CLIENT
CITY OF BARRIE

PROJECT
DYMENT'S CREEK HISTORICAL LANDFILLS
2021 ANNUAL MONITORING REPORT

CONSULTANT

YYYY-MM-DD 2021-12-02

DESIGNED

PREPARED STB

REVIEWED CLG

APPROVED

 **GOLDER**

TITLE
REGIONAL LOCATION MAP

PROJECT NO.
1111700043

CONTROL
0004

REV.
A

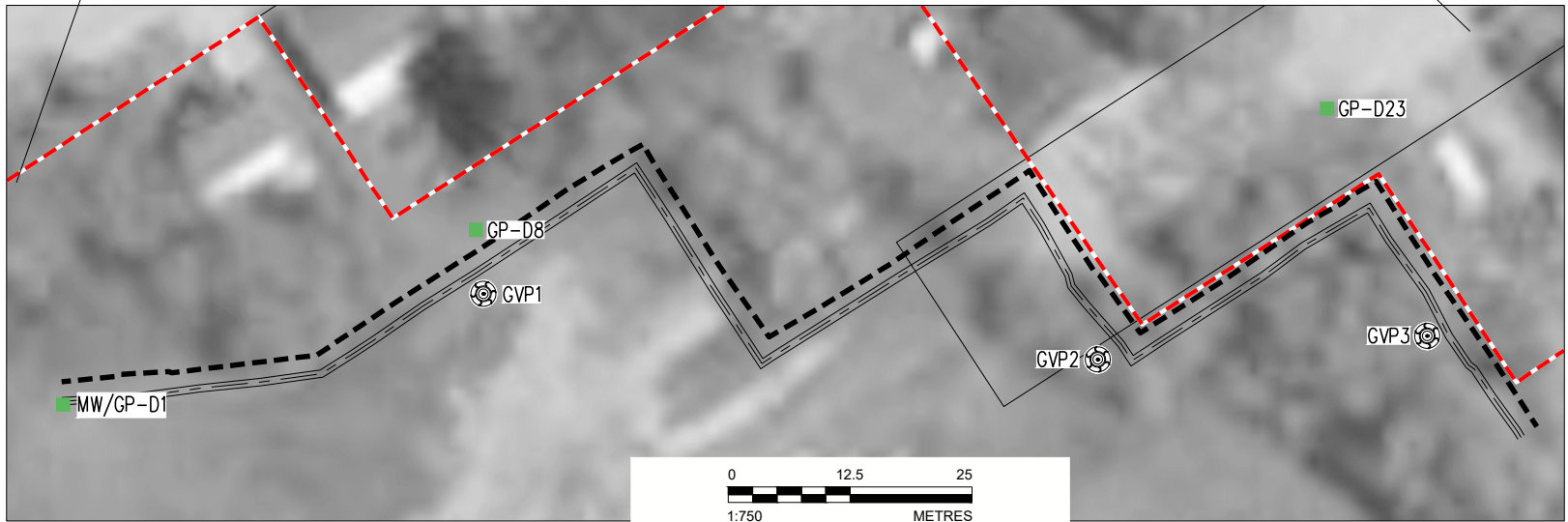
FIGURE
1

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LEGEND:	
	Estimated Waste Limit
	Alignment of Sheet Pile Wall
	Gas Vent Trench
	Gas Probe
	Monitoring Well
	Monitoring Well / Gas Probe
	Surface Water Sampling Location
	Monitoring Well Completed by Others
	City of Barrie Monitoring Well
	Gas Venting Pole

CLOSE-UP OF SITE 6 LANDFILL GAS VENTING SYSTEM



NOTES:

1. Datum is NAD83 Zone 17
2. All Mapped Boundaries, Limits, and Interpolated Features are Approximate
3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
4. Image County of Simcoe 2018, Site Features are Approximate
5. Site 6 Operational from 1962-1963, Site 5 Operational from 1961-1962, and Site 4 Operational from 1960-1961

CLIENT
CITY OF BARRIE

PROJECT
DYMENT'S CREEK HISTORICAL LANDFILLS
2021 ANNUAL MONITORING REPORT

CONSULTANT

wsp **GOLDER**

YYYY-MM-DD 2021-12-02

DESIGNED

PREPARED STB

REVIEWED CLG

APPROVED

TITLE
SAMPLING LOCATION MAP

PROJECT NO.
1111700043

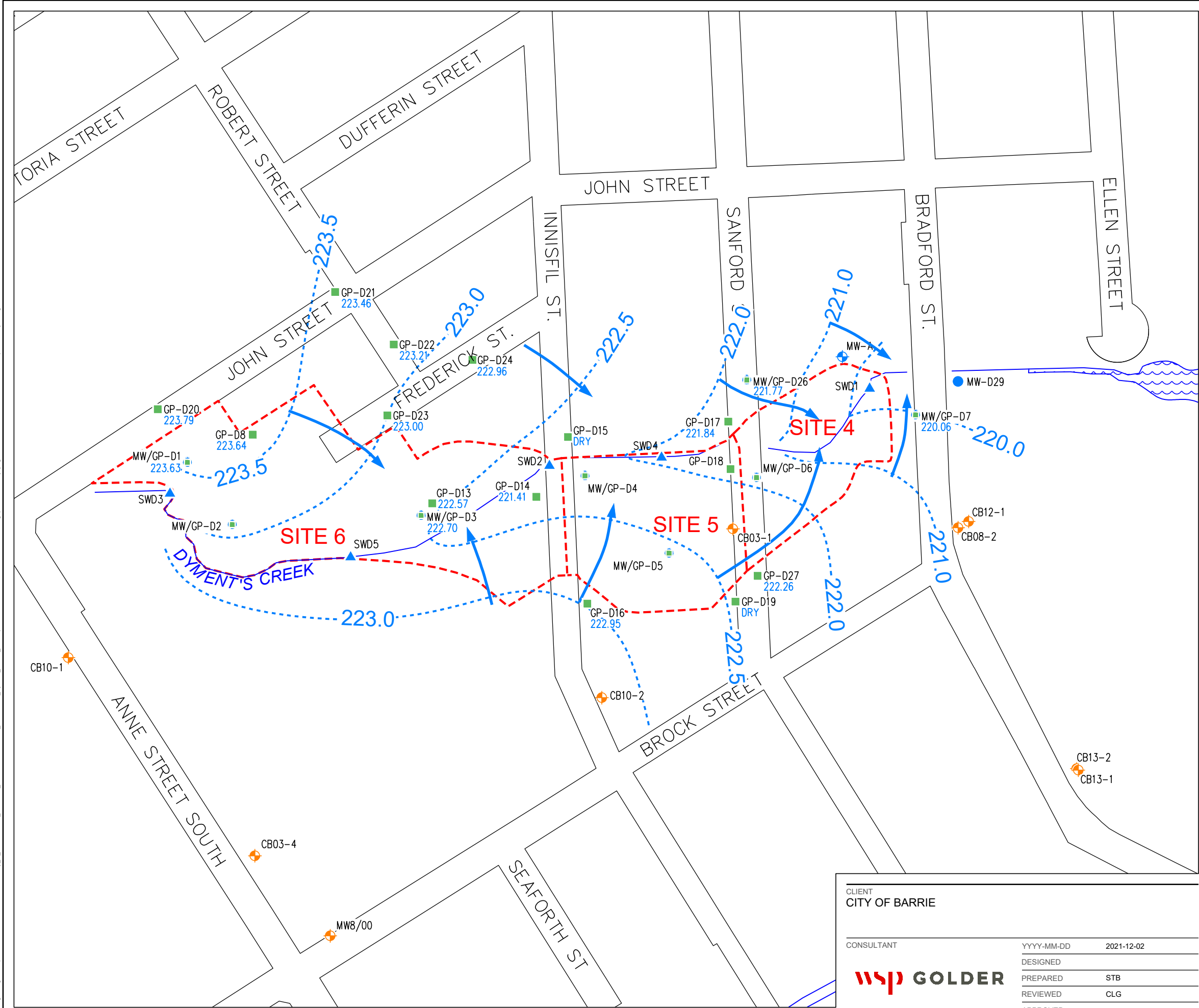
CONTROL
0004

REV.
A

FIGURE
2

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3S/B

Path: \\golder-gis.com\planning\data\office\Ontario\SNM\Clients\City of Barrie\Historic_Landfills\00_PROJ\111700043-0004-HS-0003.dwg | Last Edited By: jregier Date: 2022-02-15 Time: 3:54:38 PM | Printed By: JRegier Date: 2022-02-15 Time: 3:59:21 PM



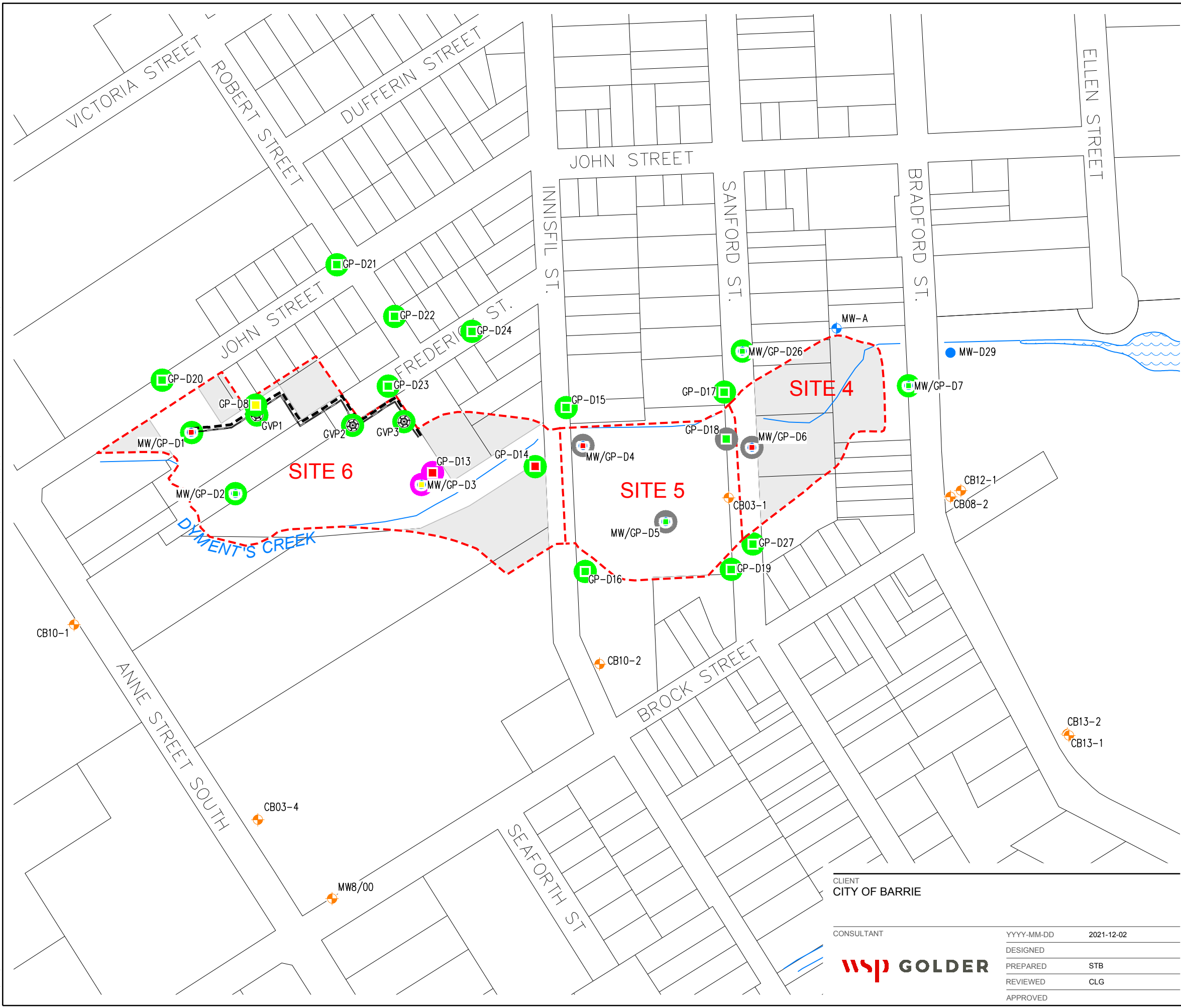
LEGEND:

- Estimated Waste Limit
- Surface Water Station
- Gas Probe
- Monitoring Well / Gas Probe
- Monitoring Well Completed by Others
- City of Barrie Monitoring Well
- Interpolated Equipotential Line
- Interpolated Groundwater Flow Direction
- Shallow Static Water Elevation (masl)

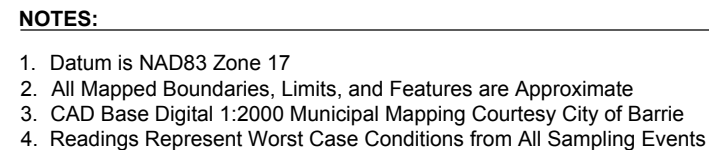
- NOTES:**
1. Datum is NAD83 Zone 17
 2. All Mapped Boundaries, Limits, and Features are Approximate
 3. CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
 4. Shallow Static Water Elevations Taken February 3, 2021

CLIENT CITY OF BARRIE		PROJECT DYMET'S CREEK HISTORICAL LANDFILLS 2021 ANNUAL MONITORING REPORT	
CONSULTANT wsp GOLDER	YYYY-MM-DD	2021-12-02	TITLE GROUNDWATER ELEVATIONS FEBRUARY 2021
	DESIGNED		PROJECT NO. 1111700043
	PREPARED	STB	CONTROL 0004
	REVIEWED	CLG	REV. A
APPROVED		FIGURE 3	

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



	Estimated Waste Limit
	Alignment of Sheet Pile Wall
	Gas Vent Trench
	Gas Probe (Typical Screen Saturation <50%)
	Gas Probe (Typical Screen Saturation 50% - 90%)
	Gas Probe (Typical Screen Saturation >90%)
	Monitoring Well
	Monitoring Well / Gas Probe (Typical Screen Saturation <50%)
	Monitoring Well / Gas Probe (Typical Screen Saturation 50% - 90%)
	Monitoring Well / Gas Probe (Typical Screen Saturation >90%)
	Monitoring Well Completed by Others
	City of Barrie Monitoring Well
	Gas Venting Pole
	<0.2% Methane Gas Concentration
	0.2% - 4.9% Methane Gas Concentration
	>5.0% Methane Gas Concentration
	Methane Gas Concentration Not Monitored
	Privately Owned Property Within Estimated Landfill Limits



PROJECT NO. 1111700043	CONTROL 0004	REV. A	FIGURE 5
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TABLES

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D1		Site 6	28-Jun-12	0.0	0.0	17.8	82.2
GP-D1	1.86	Site 6	17-Sep-12	No Reading Taken			
GP-D1		Site 6	18-Oct-12	0.4	4.8	11.3	83.5
GP-D1	1.67	Site 6	03-Dec-12	0.0	2.2	16.4	81.4
GP-D1	1.65	Site 6	18-Dec-12	0.5	1.3	17.9	80.3
GP-D1	1.46	Site 6	04-Apr-13	0.0	2.1	12.7	85.2
GP-D1	1.64	Site 6	20-Jun-13	0.0	2.1	17.6	80.3
GP-D1	1.68	Site 6	22-Aug-13	0.1	5.8	12.9	81.2
GP-D1	1.71	Site 6	11-Oct-13	0.1	0.9	20.1	79.0
GP-D1	1.68	Site 6	13-Dec-13	0.1	1.0	22.3	76.6
GP-D1	1.76	Site 6	12-Feb-14	0.0	1.6	21.1	77.3
GP-D1	1.62	Site 6	27-Nov-14	0.0	1.1	20.6	78.3
GP-D1	1.62	Site 6	11-Mar-15	0.1	1.1	21.1	77.7
GP-D1	1.83	Site 6	21-Sep-15	0.0	4.7	17.0	78.3
GP-D1	1.57	Site 6	14-Dec-15	1.1	1.6	18.5	78.8
GP-D1	1.31	Site 6	28-Feb-17	0.0	0.1	22.0	77.9
GP-D1	1.42	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D1	1.88	Site 6	29-Aug-19	0.0	2.4	17.6	80.0
GP-D1	1.61	Site 6	09-Mar-20	0.0	1.2	18.2	80.6
GP-D1	2.37	Site 6	11-Sep-20	0.0	1.6	19.9	78.5
GP-D1	1.65	Site 6	03-Feb-21	0.1	0.8	20.8	78.3
GP-D1	1.70	Site 6	17-Sep-21	0.0	1.0	20.8	78.2
GP-D2		Site 6	15-Jun-12	9.2	-	-	-
GP-D2		Site 6	28-Jun-12	6.6	5.9	11.2	76.4
GP-D2	2.62	Site 6	17-Sep-12	No Reading Taken			
GP-D2		Site 6	18-Oct-12	10.4	12.0	8.8	68.8
GP-D2	2.42	Site 6	03-Dec-12	15.8	14.1	4.9	65.2
GP-D2	2.36	Site 6	18-Dec-12	18.6	15.5	2.2	63.7
GP-D2	2.16	Site 6	04-Apr-13	16.8	12.7	1.4	69.1
GP-D2	2.43	Site 6	20-Jun-13	19.6	13.5	1.4	65.5
GP-D2	2.62	Site 6	22-Aug-13	16.8	6.3	2.1	64.7
GP-D2	2.48	Site 6	11-Oct-13	20.6	16.7	3.0	59.7
GP-D2	2.42	Site 6	13-Dec-13	13.6	10.8	11.0	64.6
GP-D2	2.54	Site 6	12-Feb-14	17.0	13.8	4.7	64.5
GP-D2	2.37	Site 6	27-Nov-14	21.0	15.7	4.5	58.8
GP-D2	2.37	Site 6	11-Mar-15	16.7	14.3	1.1	67.9
GP-D2	2.55	Site 6	21-Sep-15	15.4	18.8	2.3	63.5
GP-D2	2.21	Site 6	14-Dec-15	19.2	16.3	1.2	63.3
GP-D2	1.95	Site 6	14-Mar-16	22.3	13.5	0.6	63.6
GP-D2	2.63	Site 6	06-Sep-16	1.2	11.7	7.1	80.0
GP-D2	2.06	Site 6	28-Feb-17	9.0	13.7	0.7	76.6
GP-D2	2.07	Site 6	23-Feb-18	8.5	14.8	10.6	75.2
GP-D2	2.42	Site 6	09-Mar-20	0.0	12.3	2.6	85.1
GP-D2	2.42	Site 6	03-Feb-21	3.3	13.5	1.4	81.8
GP-D2	2.40	Site 6	17-Sep-21	0.0	14.5	3.8	81.7

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D3	0.81	Site 6	21-Mar-12	65.2	11.0	4.0	19.7
GP-D3		Site 6	22-Mar-12	57.3	12.0	4.1	26.6
GP-D3		Site 6	28-Jun-12	23.1	15.7	5.7	54.3
GP-D3	1.20	Site 6	17-Sep-12	No Reading Taken			
GP-D3		Site 6	18-Oct-12	35.1	19.0	6.9	30.0
GP-D3	0.81	Site 6	03-Dec-12	29.4	11.1	12.4	47.1
GP-D3	0.91	Site 6	18-Dec-12	11.5	5.3	17.1	66.1
GP-D3	0.74	Site 6	04-Apr-13	18.2	3.6	15.5	62.7
GP-D3	0.98	Site 6	20-Jun-13	17.8	9.7	10.3	62.2
GP-D3	1.23	Site 6	22-Aug-13	43.8	24.7	2.7	29.2
GP-D3	0.94	Site 6	11-Oct-13	25.2	11.5	13.3	49.9
GP-D3	0.97	Site 6	13-Dec-13	10.8	5.5	19.6	64.1
GP-D3	1.03	Site 6	12-Feb-14	50.7	16.9	2.8	29.6
GP-D3		Site 6	27-Nov-14	Well Damaged- No Reading Taken			
GP-D3		Site 6	11-Mar-15	Well Damaged- No Reading Taken			
GP-D3		Site 6	21-Sep-15	Well Damaged- No Reading Taken			
GP-D3	0.79	Site 6	14-Dec-15	19.4	7.9	15.1	57.6
GP-D3	0.38	Site 6	14-Mar-16	5.0	1.1	21.4	72.6
GP-D3	1.83	Site 6	06-Sep-16	18.4	17.3	7.1	57.2
GP-D3	0.62	Site 6	28-Feb-17	0.3	0.4	21.8	77.5
GP-D3	0.45	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D3	0.79	Site 6	09-Mar-20	13.9	4.2	15.3	66.6
GP-D3	0.93	Site 6	11-Sep-20	8.1	6.5	15.1	70.3
GP-D3	0.83	Site 6	03-Feb-21	34.3	9.8	11.2	44.7
GP-D3	0.41	Site 6	17-Sep-21	12.5	6.9	15.8	64.8
GP-D7		Site 4	15-Jun-12	0.0	-	-	-
GP-D7		Site 4	28-Jun-12	0.0	0.8	14.2	85.0
GP-D7	1.88	Site 4	17-Sep-12	No Reading Taken			
GP-D7		Site 4	18-Oct-12	0.0	0.3	20.1	79.6
GP-D7	1.85	Site 4	03-Dec-12	0.0	1.1	16.7	82.2
GP-D7	1.85	Site 4	18-Dec-12	0.0	1.2	16.5	82.3
GP-D7	1.70	Site 4	04-Apr-13	0.0	0.4	19.2	80.4
GP-D7	1.75	Site 4	20-Jun-13	0.0	0.7	14.0	85.3
GP-D7	1.92	Site 4	22-Aug-13	0.0	2.6	13.7	83.6
GP-D7	1.85	Site 4	11-Oct-13	0.0	1.1	17.6	81.2
GP-D7	1.85	Site 4	13-Dec-13	0.0	0.7	20.8	78.5
GP-D7	1.94	Site 4	13-Feb-14	0.0	1.5	19.2	79.3
GP-D7	1.87	Site 4	27-Nov-14	0.0	1.5	16.9	81.6
GP-D7	1.87	Site 4	11-Mar-15	0.0	0.6	21.3	78.1
GP-D7	2.09	Site 4	21-Sep-15	0.0	3.9	12.4	83.7
GP-D7	2.04	Site 4	14-Dec-15	0.0	2.0	15.0	83.0
GP-D7	1.76	Site 4	28-Feb-17	0.0	0.5	17.4	82.1
GP-D7	2.02	Site 4	08-Sep-17	0.0	3.0	13.3	83.7
GP-D7	1.87	Site 4	23-Feb-18	0.7	0.4	20.9	78.0
GP-D7	2.02	Site 4	04-Sep-18	0.0	3.4	12.7	83.9
GP-D7	1.80	Site 4	01-Apr-19	0.0	0.0	20.8	79.2
GP-D7	2.03	Site 4	29-Aug-19	1.0	0.2	19.5	79.3
GP-D7	1.78	Site 4	14-Feb-20	0.0	0.0	20.6	79.4
GP-D7	2.06	Site 4	11-Sep-20	0.0	1.7	16.0	82.3
GP-D7	2.05	Site 4	03-Feb-21	0.0	0.7	18.0	81.3
GP-D7	2.03	Site 4	20-Sep-21	0.0	2.0	15.4	82.6

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D18		Site 5	15-Jun-12	0.0	-	-	-
GP-D8		Site 6	15-Jun-12	0.0	-	-	-
GP-D8		Site 6	28-Jun-12	0.0	0.0	18.1	81.9
GP-D8		Site 6	18-Oct-12	0.2	0.8	20.3	78.8
GP-D8	1.99	Site 6	03-Dec-12	0.2	0.5	20.8	78.5
GP-D8	1.96	Site 6	18-Dec-12	0.0	0.5	21.0	78.5
GP-D8	1.79	Site 6	04-Apr-13	0.0	0.3	20.3	79.4
GP-D8	1.91	Site 6	20-Jun-13	0.1	0.5	19.3	80.1
GP-D8	2.11	Site 6	22-Aug-13	0.0	0.9	20.2	78.9
GP-D8	2.04	Site 6	11-Oct-13	0.1	0.5	21.0	78.4
GP-D8	1.96	Site 6	13-Dec-13	0.0	0.5	20.8	78.7
GP-D8	2.10	Site 6	12-Feb-14	0.0	0.8	22.6	76.6
GP-D8	1.76	Site 6	27-Nov-14	0.0	0.8	21.0	78.2
GP-D8	1.76	Site 6	11-Mar-15	0.0	0.9	21.8	77.3
GP-D8	2.14	Site 6	21-Sep-15	0.0	1.4	20.8	77.8
GP-D8	1.93	Site 6	14-Dec-15	0.2	0.6	20.5	78.7
GP-D8	1.66	Site 6	14-Mar-16	0.1	0.3	22.2	77.4
GP-D8	2.18	Site 6	06-Sep-16	0.1	1.1	19.0	79.8
GP-D8	1.57	Site 6	28-Feb-17	0.0	0.4	21.6	78.0
GP-D8	2.00	Site 6	08-Sep-17	0.1	0.8	20.6	78.5
GP-D8	1.39	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D8	2.92	Site 6	04-Sep-18	0.0	0.8	20.2	79.0
GP-D8	1.78	Site 6	01-Apr-19	0.0	0.6	19.7	79.6
GP-D8	2.18	Site 6	29-Aug-19	0.0	0.4	19.7	79.9
GP-D8	1.80	Site 6	14-Feb-20	0.0	0.3	20.1	79.6
GP-D8	2.03	Site 6	11-Sep-20	0.0	1.9	19.8	78.3
GP-D8	1.94	Site 6	03-Feb-21	0.0	0.5	20.6	78.9
GP-D8	1.96	Site 6	17-Sep-21	0.0	0.3	21.7	78.0

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

Well ID	Water (mbgs)	Site	Sample Date	Landfill Gas Readings - GEM 2000			
				CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D13	0.37	Site 6	03-Dec-12	20.4	7.4	15.7	56.5
GP-D13	0.39	Site 6	18-Dec-12	20.8	7.2	15.7	56.3
GP-D13	0.26	Site 6	04-Apr-13	5.1	1.4	19.5	74.4
GP-D13	0.42	Site 6	20-Jun-13	24.0	5.6	14.1	57.4
GP-D13	0.68	Site 6	22-Aug-13	16.8	5.9	16.1	58.2
GP-D13	0.43	Site 6	11-Oct-13	20.6	8.3	15.2	53.6
GP-D13	0.44	Site 6	13-Dec-13	42.5	12.7	15.8	29.0
GP-D13	0.45	Site 6	12-Feb-14	28.5	7.9	14.9	48.7
GP-D13	0.35	Site 6	27-Nov-14	15.0	4.7	17.8	62.5
GP-D13	0.35	Site 6	11-Mar-15	27.6	6.6	14.6	51.2
GP-D13	0.62	Site 6	21-Sep-15	20.2	8.5	16.6	54.7
GP-D13	0.30	Site 6	14-Dec-15	46.8	14.7	7.5	31.0
GP-D13	0.16	Site 6	14-Mar-16	26.7	6.6	14.8	51.9
GP-D13	0.70	Site 6	06-Sep-16	29.3	9.9	11.5	49.2
GP-D13	0.18	Site 6	28-Feb-17	12.0	3.0	18.7	66.3
GP-D13	0.54	Site 6	08-Sep-17	41.6	13.2	8.1	35.1
GP-D13	0.10	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D13	0.59	Site 6	04-Sep-18	35.2	9.1	11.2	44.5
GP-D13	0.53	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D13	0.72	Site 6	29-Aug-19	15.2	3.7	16.4	64.7
GP-D13	0.43	Site 6	14-Feb-20	14.6	2.8	13.2	69.4
GP-D13	0.35	Site 6	03-Feb-21	10.0	1.9	19.6	68.5
GP-D13	not measured	Site 6	17-Sep-21	10.3	2.4	19.0	68.3
GP-D13	0.34	Site 6	06-Oct-21	22.2	10.7	9.3	57.8
GP-D14		Site 6	15-Jun-12	0.5	-	-	-
GP-D14		Site 6	15-Jun-12	3.4	-	-	-
GP-D14		Site 6	28-Jun-12	0.2	0.0	18.5	81.3
GP-D14	1.70	Site 6	17-Sep-12	No Reading Taken			
GP-D14		Site 6	18-Oct-12	0.0	0.0	21.3	78.7
GP-D14	1.49	Site 6	03-Dec-12	0.0	0.1	21.3	78.6
GP-D14	1.53	Site 6	18-Dec-12	0.0	0.1	21.2	78.7
GP-D14	1.32	Site 6	04-Apr-13	0.0	0.0	21.0	79.0
GP-D14	1.66	Site 6	20-Jun-13	0.2	0.3	19.4	80.1
GP-D14	1.75	Site 6	22-Aug-13	0.1	0.2	20.8	78.9
GP-D14	1.62	Site 6	11-Oct-13	0.1	0.0	21.4	78.5
GP-D14	1.62	Site 6	13-Dec-13	0.0	1.7	22.1	76.2
GP-D14	1.65	Site 6	12-Feb-14	0.0	0.6	20.8	78.6
GP-D14	1.36	Site 6	27-Nov-14	0.2	0.6	21.6	77.6
GP-D14	1.36	Site 6	11-Mar-15	0.0	1.6	20.9	77.5
GP-D14	1.75	Site 6	21-Sep-15	0.0	4.8	17.2	78.0
GP-D14	1.63	Site 6	14-Dec-15	0.4	2.0	18.7	78.9
GP-D14	1.11	Site 6	14-Mar-16	1.2	0.6	22.3	76.9
GP-D14	1.77	Site 6	06-Sep-16	6.9	15.7	5.3	72.1
GP-D14	1.64	Site 6	25-Nov-16	0.5	0.3	20.2	79.0
GP-D14	1.30	Site 6	27-Feb-17	1.6	1.0	21.3	76.1
GP-D14	1.69	Site 6	08-Sep-17	3.3	10.4	11.3	75.0
GP-D14	1.16	Site 6	23-Feb-18	0.1	0.1	21.8	78.0
GP-D14	1.70	Site 6	04-Sep-18	1.3	7.5	12.6	78.6
GP-D14	1.55	Site 6	01-Apr-19	0.2	0.3	20.1	79.4
GP-D14	1.74	Site 6	29-Aug-19	0.0	5.4	15.4	79.2
GP-D14	1.56	Site 6	14-Feb-20	0.1	0.1	19.7	80.1
GP-D14	1.71	Site 6	11-Sep-20	0.3	4.9	16.9	77.9
GP-D14	1.59	Site 6	03-Feb-21	0.8	3.4	18.7	77.1
GP-D14	1.41	Site 6	17-Sep-21	0.2	5.6	14.5	79.7

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D15	1.98	Site 5	03-Dec-12	0.0	1.6	19.8	78.6
GP-D15	1.99	Site 5	18-Dec-12	0.0	1.9	19.8	78.3
GP-D15	1.89	Site 5	04-Apr-13	0.0	1.2	19.8	79.0
GP-D15	1.99	Site 5	20-Jun-13	0.0	1.1	19.7	79.1
GP-D15	2.15	Site 5	22-Aug-13	0.1	3.4	18.0	78.4
GP-D15	2.07	Site 5	11-Oct-13	0.1	0.6	20.9	78.4
GP-D15	2.00	Site 5	13-Dec-13	0.0	2.6	22.0	75.4
GP-D15	2.10	Site 5	12-Feb-14	0.0	1.9	21.9	76.2
GP-D15	1.87	Site 5	27-Nov-14	0.0	2.2	19.7	78.1
GP-D15	1.87	Site 5	11-Mar-15	0.0	1.5	21.3	77.2
GP-D15	2.17	Site 5	21-Sep-15	0.0	4.4	18.0	77.6
GP-D15	1.92	Site 5	14-Dec-15	0.0	2.2	18.9	78.9
GP-D15	1.79	Site 5	27-Feb-17	0.0	1.0	21.1	77.9
GP-D15	1.97	Site 5	08-Sep-17	0.0	2.9	18.5	78.6
GP-D15	1.90	Site 5	23-Feb-18	0.0	0.1	22.0	77.9
GP-D15	2.01	Site 5	04-Sep-18	0.0	3.9	17.1	79.0
GP-D15	1.86	Site 5	01-Apr-19	0.0	0.2	20.4	79.4
GP-D15	2.01	Site 5	29-Aug-19	0.0	3.2	17.0	79.8
GP-D15	1.88	Site 5	14-Feb-20	0.0	0.0	20.8	79.2
GP-D15	2.14	Site 5	03-Feb-21	0.0	1.5	20.4	78.1
GP-D15	2.14	Site 5	17-Sep-21	0.0	4.0	16.8	79.2
GP-D16		Site 5	28-Jun-12	0.0	0.2	18.4	81.4
GP-D16	2.40	Site 5	17-Sep-12	No Reading Taken			
GP-D16		Site 5	18-Oct-12	0.0	2.8	18.2	79.0
GP-D16	2.34	Site 5	03-Dec-12	0.0	2.5	19.1	78.4
GP-D16	2.33	Site 5	18-Dec-12	0.0	2.3	19.1	78.6
GP-D16	2.18	Site 5	04-Apr-13	0.0	2.7	16.9	80.4
GP-D16	2.19	Site 5	20-Jun-13	0.0	2.7	15.6	81.7
GP-D16	2.39	Site 5	22-Aug-13	0.1	2.2	19.1	78.6
GP-D16	2.38	Site 5	11-Oct-13	0.1	1.7	19.7	78.5
GP-D16	2.33	Site 5	13-Dec-13	0.0	2.9	21.8	75.3
GP-D16	2.45	Site 5	12-Feb-14	0.0	3.9	16.1	80.0
GP-D16	2.31	Site 5	27-Nov-14	0.0	3.4	19.1	77.5
GP-D16	1.87	Site 5	11-Mar-15	0.0	2.2	18.7	79.1
GP-D16	2.43	Site 5	21-Sep-15	0.0	2.9	18.4	78.7
GP-D16	2.41	Site 5	14-Dec-15	0.0	2.1	18.9	79.0
GP-D16	2.05	Site 5	27-Feb-17	0.0	1.4	20.6	78.0
GP-D16	2.24	Site 5	08-Sep-17	0.0	1.6	19.7	78.7
GP-D16	2.28	Site 5	23-Feb-18	0.0	0.0	22.1	77.9
GP-D16	2.40	Site 5	04-Sep-18	0.0	2.2	17.2	80.6
GP-D16	2.30	Site 5	01-Apr-19	0.0	0.0	20.7	79.3
GP-D16	2.41	Site 5	29-Aug-19	0.0	1.2	18.7	80.1
GP-D16	2.27	Site 5	14-Feb-20	0.0	0.1	20.6	79.3
GP-D16	2.31	Site 5	03-Feb-21	0.0	1.5	19.3	79.2
GP-D16	2.24	Site 5	17-Sep-21	0.0	1.7	19.9	78.4

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D17	2.08	Site 5	03-Dec-12	0.0	0.5	20.8	78.7
GP-D17	2.08	Site 5	19-Dec-12	0.0	0.5	20.6	78.9
GP-D17	1.97	Site 5	04-Apr-13	0.0	0.1	20.1	79.8
GP-D17	1.83	Site 5	20-Jun-13	0.0	1.1	15.8	83.1
GP-D17	2.21	Site 5	22-Aug-13	0.1	1.6	19.1	79.2
GP-D17	2.12	Site 5	11-Oct-13	0.1	0.8	20.7	78.4
GP-D17	2.04	Site 5	13-Dec-13	0.0	0.7	22.3	77.0
GP-D17	2.16	Site 5	25-Feb-14	0.0	0.7	21.4	77.9
GP-D17	2.04	Site 5	27-Nov-14	0.0	0.8	21.2	78.0
GP-D17	2.04	Site 5	12-Mar-15	0.0	0.7	22.0	77.3
GP-D17	2.23	Site 5	21-Sep-15	0.0	1.2	20.1	78.7
GP-D17	2.08	Site 5	14-Dec-15	0.0	0.5	20.3	79.2
GP-D17	1.81	Site 5	20-Mar-17	0.0	0.4	20.9	78.7
GP-D17	2.15	Site 5	08-Sep-17	0.0	1.1	19.9	79.0
GP-D17	2.05	Site 5	23-Feb-18	0.0	0.0	22.3	77.7
GP-D17	2.26	Site 5	04-Sep-18	0.0	1.4	18.8	79.8
GP-D17	2.00	Site 5	01-Apr-19	0.0	0.0	20.9	79.1
GP-D17	2.30	Site 5	29-Aug-19	0.0	1.3	16.8	81.9
GP-D17	2.04	Site 5	14-Feb-20	0.0	0.0	20.4	79.6
GP-D17	2.21	Site 5	11-Sep-20	0.0	1.0	19.5	79.5
GP-D17	2.21	Site 5	03-Mar-21	0.0	0.0	21.4	78.6
GP-D17	2.15	Site 5	17-Sep-21	0.0	1.2	19.6	79.2
GP-D19		Site 5	15-Jun-12	0.0	-	-	-
GP-D19		Site 5	28-Jun-12	0.0	0.0	18.8	81.2
GP-D19		Site 5	18-Oct-12	0.0	1.8	19.2	79.0
GP-D19	2.74	Site 5	03-Dec-12	0.0	1.4	20.0	78.6
GP-D19	2.74	Site 5	18-Dec-12	0.0	1.3	19.8	78.9
GP-D19	2.74	Site 5	04-Apr-13	0.0	2.6	14.0	83.4
GP-D19	2.74	Site 5	20-Jun-13	0.0	1.7	16.3	82.0
GP-D19	2.74	Site 5	22-Aug-13	0.1	1.4	19.7	78.8
GP-D19	2.74	Site 5	11-Oct-13	0.0	1.2	26.3	78.5
GP-D19	2.74	Site 5	13-Dec-13	0.0	1.3	20.1	78.6
GP-D19	2.37	Site 5	12-Feb-14	0.0	2.5	19.8	77.7
GP-D19	2.25	Site 5	27-Nov-14	0.0	2.0	20.3	77.7
GP-D19	2.25	Site 5	11-Mar-15	0.0	1.9	20.5	77.6
GP-D19	2.74	Site 5	21-Sep-15	0.0	2.3	19.5	78.2
GP-D19	2.74	Site 5	14-Dec-15	0.1	1.4	19.8	78.7
GP-D19	2.74	Site 5	28-Feb-17	0.0	1.1	21.3	77.6
GP-D19	2.74	Site 5	08-Sep-17	0.0	1.3	20.0	78.7
GP-D19	2.74	Site 5	23-Feb-18	0.0	0.1	22.0	77.9
GP-D19	2.74	Site 5	04-Sep-18	0.0	2.3	18.6	79.1
GP-D19	2.74	Site 5	01-Apr-19	0.1	0.3	20.2	79.4
GP-D19	2.74	Site 5	29-Aug-19	0.0	1.3	18.0	80.7
GP-D19	2.74	Site 5	14-Feb-20	0.0	0.1	20.7	79.2
GP-D19	2.75	Site 5	11-Sep-20	0.0	2.0	19.9	78.1
GP-D19	2.75	Site 5	03-Feb-21	0.0	0.9	19.9	79.2
GP-D19	2.75	Site 5	17-Sep-21	0.0	1.7	19.9	78.4

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
		Site 7	15-Jun-12	0.0	-	-	-
GP-D20	3.57	Site 6	22-Aug-13	0.0	1.9	19.0	79.1
GP-D20	3.51	Site 6	11-Oct-13	0.0	1.6	19.4	79.0
GP-D20	3.46	Site 6	13-Dec-13	0.0	0.2	21.7	78.1
GP-D20	3.58	Site 6	12-Feb-14	0.0	0.8	22.5	76.7
GP-D20	3.45	Site 6	27-Nov-14	0.0	0.9	20.9	78.2
GP-D20	3.45	Site 6	12-Mar-15	0.0	0.4	22.8	76.8
GP-D20	3.60	Site 6	21-Sep-15	0.0	1.9	20.1	78.0
GP-D20	3.46	Site 6	14-Dec-15	0.1	0.9	19.9	79.1
GP-D20	3.22	Site 6	27-Feb-17	0.0	0.4	20.4	79.2
GP-D20	3.49	Site 6	08-Sep-17	0.0	1.3	19.7	79.0
GP-D20	3.36	Site 6	23-Feb-18	0.0	0.6	21.2	78.2
GP-D20	3.51	Site 6	04-Sep-18	0.0	1.4	18.7	79.9
GP-D20	3.35	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D20	3.64	Site 6	29-Aug-19	0.0	1.1	18.6	80.3
GP-D20	3.33	Site 6	14-Feb-20	0.0	0.0	20.6	79.4
GP-D20	3.52	Site 6	11-Sep-20	0.0	1.4	19.9	78.7
GP-D20	3.45	Site 6	03-Feb-21	0.0	0.6	20.4	79.0
GP-D20	3.45	Site 6	17-Sep-21	0.0	1.5	19.3	79.2
GP-D21	3.50	Site 6	22-Aug-13	0.0	0.7	20.2	79.0
GP-D21	3.44	Site 6	11-Oct-13	0.0	0.5	21.1	78.4
GP-D21	3.36	Site 6	13-Dec-13	0.0	0.2	22.2	77.6
GP-D21	3.53	Site 6	12-Feb-14	0.0	0.4	22.8	76.8
GP-D21	3.34	Site 6	27-Nov-14	0.0	0.5	21.6	77.9
GP-D21	3.34	Site 6	12-Mar-15	0.0	0.3	22.8	76.9
GP-D21	3.55	Site 6	21-Sep-15	0.0	0.7	21.1	78.2
GP-D21	3.25	Site 6	14-Dec-15	0.1	0.2	20.7	79.0
GP-D21	3.03	Site 6	27-Feb-17	0.0	0.2	21.1	78.7
GP-D21	3.23	Site 6	23-Feb-18	0.0	0.1	22.1	77.8
GP-D21	3.28	Site 6	01-Apr-19	0.0	0.3	20.0	79.7
GP-D21	3.60	Site 6	29-Aug-19	0.0	0.5	19.1	80.4
GP-D21	3.30	Site 6	14-Feb-20	0.0	0.0	20.8	79.2
GP-D21	2.46	Site 6	11-Sep-20	0.0	0.6	20.5	78.9
GP-D21	3.38	Site 6	03-Feb-21	0.0	0.3	20.8	78.9
GP-D21	3.28	Site 6	17-Sep-21	0.0	0.5	20.9	78.6
GP-D22	4.03	Site 6	22-Aug-13	0.0	0.7	20.0	79.3
GP-D22	3.97	Site 6	11-Oct-13	0.0	0.5	20.8	78.7
GP-D22	3.88	Site 6	13-Dec-13	0.0	0.3	22.8	76.9
GP-D22	4.04	Site 6	25-Feb-14	0.0	0.2	22.2	77.6
GP-D22	3.82	Site 6	25-Nov-14	0.0	0.1	21.9	77.8
GP-D22	3.82	Site 6	12-Mar-15	0.0	0.1	21.1	78.8
GP-D22	4.07	Site 6	21-Sep-15	0.0	0.8	21.1	78.1
GP-D22	3.75	Site 6	14-Dec-15	0.1	0.3	20.7	78.9
GP-D22	3.29	Site 6	27-Feb-17	0.0	0.2	21.3	78.5
GP-D22	3.85	Site 6	08-Sep-17	0.0	0.5	20.7	78.8
GP-D22	3.75	Site 6	23-Feb-18	0.0	0.1	22.0	77.9
GP-D22	3.97	Site 6	04-Sep-18	0.1	0.1	20.3	79.5
GP-D22	3.91	Site 6	01-Apr-19	0.0	0.2	20.7	79.1
GP-D22	4.12	Site 6	29-Aug-19	0.0	0.6	18.9	80.5
GP-D22	3.90	Site 6	14-Feb-20	0.0	0.2	20.4	79.4
GP-D22	3.98	Site 6	11-Sep-20	0.0	0.5	20.7	78.8
GP-D22	3.93	Site 6	03-Mar-21	0.0	0.0	21.3	78.7
GP-D22	3.86	Site 6	17-Sep-21	0.0	0.4	20.5	79.1

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D23	2.88	Site 6	22-Aug-13	0.0	4.4	17.1	78.5
GP-D23	2.79	Site 6	11-Oct-13	0.0	0.3	21.2	78.5
GP-D23	2.71	Site 6	13-Dec-13	0.0	0.3	22.7	77.0
GP-D23	2.89	Site 6	25-Feb-14	0.0	2.3	21.2	76.5
GP-D23	2.71	Site 6	25-Nov-14	0.0	2.9	19.6	77.5
GP-D23	2.71	Site 6	16-Mar-15	0.1	2.3	20.6	77.0
GP-D23	2.90	Site 6	21-Sep-15	0.0	3.7	18.4	77.9
GP-D23	3.62	Site 6	14-Dec-15	0.0	2.7	18.5	78.8
GP-D23	2.59	Site 6	27-Feb-17	0.0	0.6	21.0	78.4
GP-D23	2.72	Site 6	08-Sep-17	0.0	4.5	17.3	78.2
GP-D23	2.56	Site 6	23-Feb-18	0.0	0.1	22.2	77.7
GP-D23	3.02	Site 6	04-Sep-18	0.0	0.4	20.0	79.6
GP-D23	2.92	Site 6	01-Apr-19	0.0	0.1	20.4	79.5
GP-D23	2.96	Site 6	29-Aug-19	0.0	4.4	15.7	79.9
GP-D23	3.93	Site 6	14-Feb-20	0.0	0.0	20.9	79.1
GP-D23	2.93	Site 6	03-Mar-21	0.0	0.0	20.9	79.1
GP-D23	2.68	Site 6	17-Sep-21	0.0	4.2	16.6	79.2
GP-D24	5.14	Site 6	22-Aug-13	0.0	1.0	20.0	79.0
GP-D24	4.07	Site 6	11-Oct-13	0.1	0.5	21.0	78.4
GP-D24	3.98	Site 6	13-Dec-13	0.0	0.3	22.8	76.9
GP-D24		Site 6	12-Feb-14	Well Buried- No Reading Taken			
GP-D24	4.01	Site 6	03-Apr-14	0.0	0.6	21.4	78.0
GP-D24	3.99	Site 6	25-Nov-14	0.0	1.0	21.4	77.7
GP-D24	3.99	Site 6	12-Mar-15	Well Buried- No Reading Taken			
GP-D24	4.18	Site 6	21-Sep-15	0.0	1.3	20.6	78.1
GP-D24	3.28	Site 6	14-Dec-15	0.0	0.6	20.3	79.1
GP-D24	3.76	Site 6	27-Feb-17	0.0	0.4	21.3	78.3
GP-D24	3.90	Site 6	08-Sep-17	0.2	1.2	20.2	78.4
GP-D24	3.87	Site 6	23-Feb-18	0.0	0.1	22.2	77.7
GP-D24	4.13	Site 6	04-Sep-18	0.0	0.9	19.6	79.5
GP-D24	4.11	Site 6	01-Apr-19	0.0	0.0	20.8	79.2
GP-D24	4.22	Site 6	30-Aug-19	0.0	1.2	19.0	79.8
GP-D24	4.12	Site 6	14-Feb-20	0.0	0.0	20.1	79.9
GP-D24	4.09	Site 6	11-Sep-20	0.0	1.0	20.5	78.5
GP-D24	4.04	Site 6	03-Mar-21	0.0	0.0	21.3	78.7
GP-D24	3.99	Site 6	17-Sep-21	0.0	0.9	20.2	78.9
GP-D26	2.81	Site 4	22-Aug-13	0.1	1.0	19.8	79.1
GP-D26	2.77	Site 4	11-Oct-13	0.1	0.6	20.9	78.4
GP-D26	2.67	Site 4	13-Dec-13	0.0	0.4	22.7	76.9
GP-D26	2.80	Site 4	25-Feb-14	0.0	0.5	21.8	77.7
GP-D26	2.68	Site 4	27-Nov-14	0.0	0.6	21.2	78.2
GP-D26	2.68	Site 4	12-Mar-15	0.0	0.3	22.5	77.2
GP-D26	2.88	Site 4	22-Sep-15	0.0	1.2	21.0	77.8
GP-D26	2.72	Site 4	14-Dec-15	0.0	0.3	20.4	79.3
GP-D26	2.41	Site 4	28-Feb-17	0.0	0.2	21.6	78.2
GP-D26	2.79	Site 4	08-Sep-17	0.0	0.8	20.1	79.1
GP-D26	2.70	Site 4	23-Feb-18	0.0	0.3	21.9	77.8
GP-D26	2.90	Site 4	04-Sep-18	0.0	1.0	19.3	79.7
GP-D26	2.82	Site 4	01-Apr-19	0.0	0.2	20.6	79.2
GP-D26	2.95	Site 4	29-Aug-19	0.0	0.8	19.4	79.8
GP-D26	2.80	Site 4	14-Feb-20	0.0	0.0	20.7	79.3
GP-D26	2.86	Site 4	03-Mar-21	0.0	0.0	21.4	78.6
GP-D26	2.79	Site 4	17-Sep-21	0.0	1.1	19.4	79.5

Table 5
Landfill Gas Concentrations (% methane by volume)
Dymont's Creek Landfills

Well ID	Water (mbgs)	Site	Sample Date	Landfill Gas Readings - GEM 2000			
				CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-D27	2.53	Site 4	22-Aug-13	0.1	4.2	15.3	80.4
GP-D27	2.58	Site 4	11-Oct-13	0.1	1.9	18.7	79.3
GP-D27	2.53	Site 4	13-Dec-13	0.0	3.5	18.1	78.4
GP-D27	2.71	Site 4	25-Feb-14	0.0	2.5	18.3	79.2
GP-D27	2.58	Site 4	25-Nov-14	0.0	5.9	13.7	80.4
GP-D27	2.58	Site 4	12-Mar-15	0.0	3.9	17.2	78.9
GP-D27	2.66	Site 4	21-Sep-15	0.0	6.1	13.3	80.6
GP-D27	2.62	Site 4	14-Dec-15	0.0	1.7	18.1	80.2
GP-D27	2.29	Site 4	28-Feb-17	0.0	3.7	15.3	81.0
GP-D27	2.44	Site 4	08-Sep-17	0.0	3.5	16.4	80.1
GP-D27	2.46	Site 4	23-Feb-18	0.0	0.0	22.4	77.6
GP-D27	2.63	Site 4	04-Sep-18	0.0	4.3	15.1	80.6
GP-D27	2.58	Site 4	01-Apr-19	0.0	0.0	20.8	79.2
GP-D27	2.63	Site 4	29-Aug-19	0.0	4.8	14.1	81.1
GP-D27	2.60	Site 4	14-Feb-20	0.0	0.2	20.5	79.2
GP-D27	2.48	Site 4	03-Mar-21	0.0	0.9	19.3	79.8
GP-D27	2.46	Site 4	17-Sep-21	0.0	6.1	13.1	80.8

Notes:

NM = not measured

bold and shaded indicates a methane concentration above 5%, the lower explosive limit of methane

Table 8
Surface Water Analytical Results
Polynuclear Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dymont's Creek

Surface Water Location				SWD1													
Sampling Location				West of Bradford Street													
Sampling Date				23-Apr-13	23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18		05-Sep-19	11-Sep-20	10-May-21	17-Sep-21
Parameter	Units	RDL	PWQO							Duplicate of SWD1			Duplicate of SWD1				
Polynuclear Aromatic Hydrocarbons																	
Naphthalene	ug/L	0.1	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthylene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Fluorene	ug/L	0.1	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010
Phenanthrene	ug/L	0.1	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.050 (1)	<0.010
Anthracene	ug/L	0.1	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Fluoranthene	ug/L	0.1	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Pyrene	ug/L	0.1	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010
Benzo(a)anthracene	ug/L	0.1	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.0085 (1)	<0.010
Chrysene	ug/L	0.05	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(b)fluoranthene	ug/L	0.05	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Benzo(k)fluoranthene	ug/L	0.05	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(a)pyrene	ug/L	0.01	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Dibenzo(a,h)anthracene	ug/L	0.1	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0075 (1)	<0.010
Benzo(g,h,i)perylene	ug/L	0.1	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.1	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
2-methylnaphthalene	ug/L	0.1	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010

Notes:
(1) RDL exceeds criteria
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 8
Surface Water Analytical Results
Polynuclear Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dymont's Creek

Surface Water Location				SWD2														
Sampling Location				West of Innisfil Street														
Sampling Date				23-Apr-13		23-Aug-13	11-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	10-May-21	17-Sep-21
Parameter	Units	RDL	PWQO		Duplicate of SWD2					Duplicate of SWD2							Duplicate of SWD2	
Polynuclear Aromatic Hydrocarbons																		
Naphthalene	ug/L	0.1	7	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010
Acenaphthylene	ug/L	0.1	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010
Acenaphthene	ug/L	0.1	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010
Fluorene	ug/L	0.1	0.2	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	<0.010
Phenanthrene	ug/L	0.1	0.03	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.050 (1)	<0.050 (1)	<0.010
Anthracene	ug/L	0.1	0.0008	<0.1	<0.1	< 0.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010 (1)	<0.010
Fluoranthene	ug/L	0.1	0.0008	<0.1	<0.1	0.85	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010 (1)	<0.010
Pyrene	ug/L	0.1	NO	<0.1	<0.1	< 0.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.020	<0.010
Benzo(a)anthracene	ug/L	0.1	0.0004	<0.1	<0.1	< 0.7	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.0085 (1)	<0.0085 (1)	<0.010
Chrysene	ug/L	0.05	0.0001	<0.05	<0.05	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.0085 (1)	<0.010
Benzo(b)fluoranthene	ug/L	0.05	NO	<0.05	<0.05	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.0085	<0.010
Benzo(k)fluoranthene	ug/L	0.05	0.0002	<0.05	<0.05	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.0085 (1)	<0.010
Benzo(a)pyrene	ug/L	0.01	NO	<0.01	<0.01	< 0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0075	<0.0090
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	NO	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.0085	<0.010
Dibenzo(a,h)anthracene	ug/L	0.1	0.002	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0075 (1)	<0.0075 (1)	<0.010
Benzo(g,h,i)perylene	ug/L	0.1	0.00002	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.0085	<0.010
Biphenyl	ug/L	0.05	0.2	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.1	2	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010
2-methylnaphthalene	ug/L	0.1	2	<0.1	<0.1	< 0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.10	<0.010

- Notes:
- (1) RDL exceeds criteria
 - 1. NO = No objective
 - 2. µg/L = Microgram per Litre
 - 3. RDL = Laboratory Reportable Detection Limit
 - 4. PWQO = Provincial Water Quality Objectives, July, 1994
 - 5. Bold type and shaded indicates an exceedance of the PWQO
 - 6. Italicized indicates the RDL is above the PWQO

Table 8
Surface Water Analytical Results
Polynuclear Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dyment's Creek

Surface Water Location				SWD3												
Sampling Location				South of John Street												
Sampling Date				23-Apr-13	23-Apr-13	11-Dec-13	26-Nov-14		24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21
Parameter	Units	RD L	PWQO					Duplicate of SWD3								
Polynuclear Aromatic Hydrocarbons																
Naphthalene	ug/L	0.1	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthylene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Fluorene	ug/L	0.1	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010
Phenanthrene	ug/L	0.1	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.050 (1)	<0.010
Anthracene	ug/L	0.1	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Fluoranthene	ug/L	0.1	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Pyrene	ug/L	0.1	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010
Benzo(a)anthracene	ug/L	0.1	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.0085 (1)	<0.010
Chrysene	ug/L	0.05	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(b)fluoranthene	ug/L	0.05	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Benzo(k)fluoranthene	ug/L	0.05	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(a)pyrene	ug/L	0.01	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Dibenzo(a,h)anthracene	ug/L	0.1	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0075 (1)	<0.010
Benzo(g,h,i)perylene	ug/L	0.1	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.1	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.057	<0.050	<0.10	<0.010
2-methylnaphthalene	ug/L	0.1	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010

Notes:
(1) RDL exceeds criteria
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 8
Surface Water Analytical Results
Polynuclear Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dymont's Creek

Surface Water Location				SWD4											
Sampling Location				Between Innisfil and Bradford Streets											
Sampling Date				23-Apr-13	11-Dec-13		26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21
Parameter	Units	RDL	PWQO			Duplicate of SWD4									
Polynuclear Aromatic Hydrocarbons															
Naphthalene	ug/L	0.1	7	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthylene	ug/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Acenaphthene	ug/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
Fluorene	ug/L	0.1	0.2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010
Phenanthrene	ug/L	0.1	0.03	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.050 (1)	<0.010
Anthracene	ug/L	0.1	0.0008	< 0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Fluoranthene	ug/L	0.1	0.0008	< 0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010
Pyrene	ug/L	0.1	NO	< 0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010
Benzo(a)anthracene	ug/L	0.1	0.0004	< 0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.0085 (1)	<0.010
Chrysene	ug/L	0.05	0.0001	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(b)fluoranthene	ug/L	0.05	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Benzo(k)fluoranthene	ug/L	0.05	0.0002	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010
Benzo(a)pyrene	ug/L	0.01	NO	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	NO	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Dibenzo(a,h)anthracene	ug/L	0.1	0.002	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0075 (1)	<0.010
Benzo(g,h,i)perylene	ug/L	0.1	0.00002	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010
Biphenyl	ug/L	0.05	0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.1	2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010
2-methylnaphthalene	ug/L	0.1	2	< 0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010

Notes:
(1) RDL exceeds criteria
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

Table 8
Surface Water Analytical Results
Polynuclear Aromatic Hydrocarbons
City of Barrie Historic Waste Sites Dymont's Creek

Surface Water Location				SWD5												FIELD BLANK
Sampling Location				Between John and Innisfil Streets												
Sampling Date				23-Apr-13	11-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	10-May-21	17-Sep-21	17-Sep-21	17-Sep-21
Parameter	Units	RDL	PWQO												Duplicate of SWD5	
Polynuclear Aromatic Hydrocarbons																
Naphthalene	ug/L	0.1	7	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.010
Acenaphthylene	ug/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.010
Acenaphthene	ug/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.010
Fluorene	ug/L	0.1	0.2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.010	<0.010
Phenanthrene	ug/L	0.1	0.03	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.050 (1)	<0.010	<0.010	<0.010
Anthracene	ug/L	0.1	0.0008	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010	<0.010	<0.010
Fluoranthene	ug/L	0.1	0.0008	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010 (1)	<0.010	<0.010	<0.010
Pyrene	ug/L	0.1	NO	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.020	<0.010	<0.010	<0.010
Benzo(a)anthracene	ug/L	0.1	0.0004	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.0085 (1)	<0.010	<0.010	<0.010
Chrysene	ug/L	0.05	0.0001	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010	<0.010	<0.010
Benzo(b)fluoranthene	ug/L	0.05	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.010	<0.010
Benzo(k)fluoranthene	ug/L	0.05	0.0002	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085 (1)	<0.010	<0.010	<0.010
Benzo(a)pyrene	ug/L	0.01	NO	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0075	<0.0090	<0.0090	<0.0090
Indeno(1,2,3-c,d)pyrene	ug/L	0.1	NO	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.010	<0.010
Dibenzo(a,h)anthracene	ug/L	0.1	0.002	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0075 (1)	<0.010	<0.010	<0.010
Benzo(g,h,i)perylene	ug/L	0.1	0.00002	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.0085	<0.010	<0.010	<0.010
Biphenyl	ug/L	0.05	0.2	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.1	2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.010
2-methylnaphthalene	ug/L	0.1	2	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.10	<0.010	<0.010	<0.010

Notes:
(1) RDL exceeds criteria
1. NO = No objective
2. µg/L = Microgram per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994
5. Bold type and shaded indicates an exceedance of the PWQO
6. Italicized indicates the RDL is above the PWQO

APPENDIX A

2021 Sampling Locations

Table A-1
City of Barrie Dymont's Creek Landfills
2021 Sampling Locations and Elevations

11-1170-0043

Well	Monitoring Pipe Elevations (masl)	Ground Surface Elevations (masl)	Well Screen Elevations (masl)	
			Top of Screen (masl)	Bottom of Screen (masl)
Site 4				
GP-D7	222.79	222.11	221.35	219.83
GP-D26	224.51	224.63	223.56	220.51
GP-D27	224.60	224.74	223.83	220.78
Site 5				
GP-D15	225.44	224.54	223.92	222.40
GP-D16	226.16	225.25	224.04	222.51
GP-D17	223.94	224.04	223.05	221.53
GP-D19	226.33	225.34	224.12	222.60
Site 6				
GP-D1	226.16	225.28	223.75	222.23
GP-D2	226.09	225.20	223.67	222.15
GP-D3	224.59	223.53	223.22	221.7
GP-D8	226.51	225.58	224.05	222.53
GP-D13	223.81	222.93	222.47	220.95
GP-D14	228.47	227.59	226.06	224.54
GP-D20	228.16	227.25	225.88	222.83
GP-D21	227.82	226.84	225.62	222.57
GP-D22	227.03	227.15	225.62	222.58
GP-D23	225.73	225.93	225.01	221.97
GP-D24	226.79	227.00	224.56	221.51

Notes:

masl - metres above sea level

APPENDIX B

Groundwater Elevations

Table B-1
Groundwater Elevations
Dymont's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D1	226.16	225.28	3.93	3.05	1.52	223.75	222.23	2012-09-17	2.74	1.86	223.41
								2012-12-03	2.55	1.67	223.61
								2012-12-18	2.53	1.65	223.63
								2013-04-04	2.34	1.46	223.82
								2013-06-20	2.52	1.64	223.64
								2013-08-22	2.72	1.84	223.44
								2013-10-11	2.59	1.71	223.56
								2013-12-13	2.56	1.68	223.60
								2014-02-12	2.64	1.76	223.52
								2014-11-27	2.50	1.62	223.66
								2015-03-11	2.71	1.83	223.45
								2015-09-21	2.71	1.83	223.45
								2015-12-14	2.45	1.57	223.70
								2017-02-28	2.19	1.31	223.97
								2018-02-23	2.30	1.42	223.86
								2019-08-29	2.76	1.88	223.40
								2020-03-09	2.49	1.61	223.67
								2020-09-11	3.25	2.37	222.91
								2021-02-03	2.53	1.65	223.63
								2021-09-17	2.58	1.70	223.58
GP-D2	226.09	225.20	3.94	3.05	1.52	223.67	222.15	2012-09-17	3.52	2.62	222.57
								2012-12-03	3.31	2.42	222.78
								2012-12-18	3.25	2.36	222.84
								2013-04-04	3.05	2.16	223.04
								2013-06-20	3.32	2.43	222.77
								2013-08-22	3.51	2.62	222.58
								2013-10-11	3.37	2.48	222.72
								2013-12-13	3.32	2.42	222.78
								2014-02-12	3.43	2.54	222.66
								2014-11-27	3.27	2.37	222.83
								2015-03-11	3.48	2.59	222.61
								2015-09-21	3.45	2.55	222.64
								2015-12-14	3.11	2.21	222.99
								2016-03-14	2.85	1.95	223.25
								2016-09-06	3.52	2.63	222.57
								2017-02-28	2.95	2.06	223.14
								2018-02-23	2.96	2.07	223.13
								2020-03-09	3.31	2.42	222.78
								2021-02-03	3.31	2.42	222.78
								2021-09-17	3.29	2.40	222.80

Table B-1
Groundwater Elevations
Dymert's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D3	224.59	223.53	2.89	1.83	1.52	223.22	221.70	2012-03-21	1.87	0.81	222.72
								2012-09-17	2.26	1.20	222.33
								2012-12-03	1.87	0.81	222.71
								2012-12-18	1.97	0.91	222.62
								2013-04-04	1.80	0.74	222.79
								2013-06-20	2.04	0.98	222.55
								2013-08-22	2.29	1.23	222.30
								2013-10-11	2.00	0.94	222.59
								2013-12-13	2.03	0.97	222.55
								2014-02-12	2.09	1.03	222.49
								2014-11-27	Damaged	NA	NA
								2015-03-11	Damaged	NA	NA
								2015-09-21	Damaged	NA	NA
								2015-12-14	1.85	0.79	222.74
								2016-03-14	1.44	0.38	223.14
								2016-09-06	dry	dry	NA
								2017-02-28	1.69	0.62	222.90
								2018-02-23	1.51	0.45	223.08
								2020-03-09	1.85	0.79	222.74
								2020-09-11	1.99	0.93	222.60
								2021-02-03	1.89	0.83	222.70
								2021-09-17	1.47	0.41	223.12
MW-D7	222.80	222.10	5.01	4.30	1.52	219.32	217.80	2012-06-27	2.70	2.00	220.10
								2012-06-29	2.65	1.94	220.16
								2012-08-21	2.64	1.94	220.16
								2012-09-17	2.56	1.85	220.25
								2013-04-22	2.32	1.62	220.48
								2013-06-20	2.44	1.74	220.36
								2013-08-21	2.59	1.89	220.21
								2013-12-11	2.52	1.82	220.28
								2014-11-25	2.60	1.90	220.20
								2015-03-11	2.65	1.95	220.15
								2015-09-21	2.78	2.08	220.02
								2015-12-14	2.68	1.98	220.12
								2016-09-08	2.78	2.08	220.02
								2017-02-28	2.46	1.75	220.35
								2017-09-08	2.71	2.01	220.09
								2018-02-23	2.56	1.86	220.24
								2018-09-04	2.70	1.99	220.11
								2020-09-11	2.58	1.87	220.23

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D7	222.79	222.11	2.97	2.29	1.52	221.35	219.83	2012-09-17	2.56	1.88	220.24
								2012-12-03	2.53	1.85	220.27
								2012-12-18	2.53	1.85	220.27
								2013-04-04	2.39	1.70	220.41
								2013-06-20	2.43	1.75	220.36
								2013-08-22	2.60	1.92	220.20
								2013-10-11	2.53	1.85	220.26
								2013-12-13	2.53	1.85	220.26
								2014-02-13	2.62	1.94	220.17
								2014-11-27	2.56	1.87	220.24
								2015-03-11	2.45	1.77	220.34
								2015-09-21	2.77	2.09	220.02
								2015-12-14	2.73	2.04	220.07
								2017-02-28	2.45	1.76	220.35
								2017-09-08	2.70	2.02	220.10
								2018-02-23	2.55	1.87	220.24
								2018-09-04	2.70	2.02	220.09
								2019-04-01	2.48	1.80	220.31
								2019-08-29	2.71	2.03	220.09
								2020-02-14	2.47	1.78	220.33
								2020-09-11	2.74	2.06	220.05
								2021-02-03	2.73	2.05	220.06
								2021-09-20	2.72	2.03	220.08
GP-D8	226.51	225.58	3.98	3.05	1.52	224.05	222.53	2012-12-03	2.92	1.99	223.59
								2012-12-18	2.89	1.96	223.62
								2013-04-04	2.72	1.79	223.79
								2013-06-20	2.84	1.91	223.67
								2013-08-22	3.05	2.11	223.46
								2013-10-11	2.97	2.04	223.53
								2013-12-13	2.89	1.96	223.61
								2014-02-12	3.03	2.10	223.48
								2014-11-27	2.69	1.76	223.82
								2015-03-11	3.06	2.13	223.45
								2015-09-21	3.07	2.14	223.44
								2015-12-14	2.86	1.93	223.65
								2016-03-14	2.59	1.66	223.92
								2016-09-06	3.11	2.18	223.39
								2017-02-28	2.50	1.57	224.01
								2017-09-08	2.93	2.00	223.58
								2018-02-23	2.33	1.39	224.18
								2019-09-04	3.85	2.92	222.66
								2019-04-01	2.71	1.78	223.79
								2019-08-29	3.11	2.18	223.40
								2020-02-14	2.73	1.80	223.78
								2020-09-11	2.96	2.03	223.55
								2021-02-03	2.87	1.94	223.64
								2021-09-17	2.89	1.96	223.62

Table B-1
Groundwater Elevations
Dymont's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D13	223.77	222.93	2.82	1.98	1.52	222.47	220.95	2012-12-03	1.25	0.37	222.56
								2012-12-18	1.27	0.39	222.54
								2013-04-04	1.14	0.26	222.67
								2013-06-20	1.30	0.42	222.51
								2013-08-22	1.53	0.68	222.24
								2013-10-11	1.28	0.43	222.50
								2013-12-13	1.29	0.44	222.49
								2014-02-12	1.30	0.45	222.47
								2014-11-27	1.20	0.35	222.57
								2015-03-11	1.37	0.53	222.40
								2015-09-21	1.46	0.62	222.31
								2015-12-14	1.14	0.30	222.63
								2016-03-14	1.00	0.16	222.77
								2016-09-06	1.54	0.70	222.23
								2017-02-28	1.02	0.18	222.75
								2017-09-08	1.39	0.54	222.38
								2018-02-23	0.94	0.10	222.83
								2019-09-04	1.44	0.59	222.34
								2019-04-01	1.37	0.53	222.40
								2019-08-29	1.56	0.72	222.21
								2020-02-14	1.27	0.43	222.50
GP-D14	223.89	223.00	3.93	3.05	1.52	221.47	219.95	2021-02-03	1.20	0.35	222.57
								2021-09-17	nm	nm	na
								2021-10-06	1.18	0.34	222.59
								2012-09-17	2.59	1.70	221.30
								2012-12-03	2.37	1.49	221.51
								2012-12-18	2.42	1.53	221.47
								2013-04-04	2.21	1.32	221.68
								2013-06-20	2.54	1.66	221.34
								2013-08-22	2.63	1.75	221.25
								2013-10-11	2.50	1.62	221.39
								2013-12-13	2.51	1.62	221.38
								2014-02-12	2.54	1.65	221.35
								2014-11-27	2.25	1.36	221.64
								2015-03-11	2.56	1.68	221.33
								2015-09-21	2.63	1.75	221.25
								2015-12-14	2.51	1.63	221.38
								2016-03-14	2.00	1.11	221.89
								2016-09-06	2.65	1.77	221.24
								2016-11-25	2.52	1.64	221.37
								2017-02-27	2.18	1.30	221.71
								2017-09-08	2.57	1.69	221.31
								2018-02-23	2.04	1.16	221.85
								2018-09-04	2.58	1.70	221.31
								2019-04-01	2.44	1.55	221.45
								2019-08-29	2.63	1.74	221.26
								2020-02-14	2.45	1.56	221.44
								2020-09-11	2.59	1.71	221.29
								2021-02-03	2.47	1.59	221.41
								2021-09-17	2.29	1.41	221.60

Table B-1
Groundwater Elevations
Dymont's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D15	225.44	224.54	3.05	2.14	1.52	223.91	222.39	2012-12-03	2.88	1.98	222.56
								2012-12-18	2.89	1.99	222.55
								2013-04-04	2.80	1.89	222.64
								2013-06-20	2.89	1.99	222.55
								2013-08-22	3.06	2.15	222.38
								2013-10-11	2.97	2.07	222.47
								2013-12-13	2.90	2.00	222.54
								2014-02-12	3.01	2.10	222.43
								2014-11-27	2.77	1.87	222.67
								2015-03-11	2.90	2.00	222.54
								2015-09-21	3.08	2.17	222.36
								2015-12-14	2.82	1.92	222.62
								2017-02-27	2.69	1.79	222.75
								2017-09-08	2.87	1.97	222.57
								2018-02-23	2.80	1.90	222.64
								2018-09-04	2.91	2.01	222.53
								2019-04-01	2.76	1.86	222.68
								2019-08-29	2.91	2.01	222.53
								2020-02-14	2.78	1.88	222.66
								2021-02-03	dry	na	NA
								2021-09-17	dry	na	NA
GP-D16	226.16	225.25	3.65	2.74	1.52	224.04	222.51	2012-09-17	3.31	2.40	222.85
								2012-12-03	3.25	2.34	222.91
								2012-12-18	3.24	2.33	222.92
								2013-04-04	3.09	2.18	223.07
								2013-06-20	3.10	2.19	223.06
								2013-08-22	3.29	2.39	222.87
								2013-10-11	3.29	2.38	222.87
								2013-12-13	3.24	2.33	222.92
								2014-02-12	3.36	2.45	222.80
								2014-11-27	3.22	2.31	222.94
								2015-03-11	2.99	2.09	223.17
								2015-09-21	3.34	2.43	222.82
								2015-12-14	3.32	2.41	222.84
								2017-02-27	2.96	2.05	223.20
								2017-09-08	3.15	2.24	223.01
								2018-02-23	3.18	2.28	222.98
								2018-09-04	3.30	2.40	222.86
								2019-04-01	3.20	2.30	222.96
								2019-08-29	3.31	2.41	222.85
								2020-02-14	3.18	2.27	222.98
								2021-02-03	3.21	2.31	222.95
								2021-09-17	3.14	2.24	223.02

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D17	223.94	224.04	2.41	2.52	1.52	223.05	221.53	2012-12-03	1.98	2.08	221.96
								2012-12-19	1.98	2.08	221.96
								2013-04-04	1.87	1.97	222.07
								2013-06-20	1.73	1.83	222.21
								2013-08-22	2.11	2.21	221.83
								2013-10-11	2.02	2.12	221.92
								2013-12-13	1.94	2.04	222.00
								2014-02-12	2.06	2.16	221.88
								2014-11-27	1.94	2.04	222.00
								2015-03-12	2.11	2.21	221.83
								2015-09-21	2.13	2.23	221.81
								2015-12-14	1.98	2.08	221.96
								2017-03-20	1.71	1.81	222.23
								2017-09-08	2.04	2.15	221.90
								2018-02-23	1.95	2.05	221.99
								2018-09-04	2.16	2.26	221.78
								2019-04-01	1.90	2.00	222.04
								2019-08-29	2.20	2.30	221.74
								2020-02-14	1.94	2.04	222.00
								2020-09-11	2.11	2.21	221.83
								2021-03-03	2.11	2.21	221.84
								2021-09-17	2.05	2.15	221.89
GP-D19	226.33	225.34	3.73	2.74	1.52	224.12	222.60	2012-12-03	dry	dry	NA
								2012-12-18	dry	dry	NA
								2013-04-04	dry	dry	NA
								2013-06-20	dry	dry	NA
								2013-08-22	dry	dry	NA
								2013-10-11	dry	dry	NA
								2013-12-13	dry	dry	NA
								2014-02-12	3.36	2.37	222.97
								2014-11-27	3.24	2.25	223.09
								2015-03-11	dry	dry	NA
								2015-09-21	dry	dry	NA
								2015-12-14	dry	dry	NA
								2017-02-28	dry	dry	NA
								2017-09-08	dry	dry	NA
								2018-02-23	dry	dry	NA
								2018-09-04	dry	dry	NA
								2019-04-01	dry	dry	NA
								2019-08-29	dry	dry	NA
								2020-02-14	dry	dry	NA
								2020-09-11	3.74	2.75	222.59
								2021-02-03	dry	dry	NA
								2021-09-17	dry	dry	NA

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D20	228.16	227.25	5.33	4.42	3.05	225.88	222.83	2013-08-22	4.48	3.57	223.67
								2013-10-11	4.42	3.51	223.73
								2013-12-13	4.37	3.46	223.79
								2014-02-12	4.49	3.58	223.67
								2014-11-27	4.36	3.45	223.80
								2015-03-12	4.51	3.60	223.65
								2015-09-21	4.51	3.60	223.65
								2015-12-14	4.37	3.46	223.79
								2017-02-27	4.13	3.22	224.03
								2017-09-08	4.40	3.49	223.75
								2018-02-23	4.27	3.36	223.89
								2018-09-04	4.42	3.51	223.74
								2019-04-01	4.26	3.35	223.90
								2019-08-29	4.55	3.64	223.61
								2020-02-14	4.24	3.33	223.92
								2020-09-11	4.43	3.52	223.72
								2021-02-03	4.36	3.45	223.79
								2021-09-17	4.36	3.45	223.80
GP-D21	227.82	226.84	5.24	4.27	3.05	225.62	222.57	2013-08-22	4.48	3.50	223.34
								2013-10-11	4.42	3.44	223.40
								2013-12-13	4.34	3.36	223.48
								2014-02-12	4.50	3.53	223.32
								2014-11-27	4.32	3.34	223.50
								2015-03-12	4.52	3.55	223.30
								2015-09-21	4.52	3.55	223.29
								2015-12-14	4.22	3.25	223.59
								2017-02-27	4.01	3.03	223.81
								2018-02-23	4.21	3.23	223.61
								2019-04-01	4.25	3.28	223.57
								2019-08-29	4.57	3.60	223.25
								2020-02-14	4.28	3.30	223.54
								2020-09-11	3.43	2.46	224.38
								2021-02-03	4.35	3.38	223.46
								2021-09-17	4.25	3.28	223.57

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D22	227.03	227.15	4.45	4.57	3.05	225.63	222.58	2013-08-22	3.91	4.03	223.11
								2013-10-11	3.85	3.97	223.18
								2013-12-13	3.75	3.88	223.27
								2014-02-25	3.92	4.04	223.11
								2014-11-25	3.70	3.82	223.33
								2015-03-12	3.95	4.07	223.08
								2015-09-21	3.95	4.07	223.08
								2015-12-14	3.63	3.75	223.40
								2017-02-27	3.17	3.29	223.86
								2017-09-08	3.73	3.85	223.30
								2018-02-23	3.63	3.75	223.40
								2018-09-04	3.85	3.97	223.18
								2019-04-01	3.79	3.91	223.24
								2019-08-29	4.00	4.12	223.03
								2020-02-14	3.78	3.90	223.25
								2020-09-11	3.86	3.98	223.17
								2021-03-03	3.81	3.93	223.21
								2021-09-17	3.74	3.86	223.29
GP-D23	225.73	225.93	3.77	3.96	3.05	225.02	221.97	2013-08-22	2.69	2.88	223.05
								2013-10-11	2.60	2.79	223.14
								2013-12-13	2.52	2.71	223.21
								2014-02-25	2.69	2.89	223.04
								2014-11-25	2.51	2.71	223.22
								2016-03-16	2.55	2.74	223.18
								2015-09-21	2.71	2.90	223.03
								2015-12-14	2.43	2.62	223.31
								2017-03-28	1.71	1.90	224.03
								2017-09-08	2.52	2.72	223.21
								2018-02-23	2.37	2.56	223.37
								2018-09-04	2.83	3.02	222.90
								2019-04-01	2.73	2.92	223.01
								2019-08-29	2.76	2.96	222.97
								2020-02-14	3.74	3.93	221.99
								2021-03-03	2.74	2.93	223.00
								2021-09-17	2.49	2.68	223.24

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D24	226.79	227.00	5.28	5.49	3.05	224.56	221.51	2013-08-22	4.93	5.14	221.87
								2013-10-11	3.86	4.07	222.93
								2013-12-13	3.77	3.98	223.03
								2014-02-12	Buried	NA	NA
								2014-11-25	3.78	3.99	223.01
								2015-03-12	Buried	NA	NA
								2015-09-21	3.97	4.18	222.83
								2015-12-14	3.07	3.28	223.72
								2017-02-27	3.55	3.76	223.24
								2017-09-08	3.69	3.90	223.11
								2018-02-23	3.66	3.87	223.14
								2018-09-04	3.92	4.13	222.87
								2019-04-01	3.90	4.11	222.89
								2019-08-30	4.01	4.22	222.78
								2020-02-14	3.91	4.12	222.88
								2020-09-11	3.88	4.09	222.91
								2021-03-03	3.83	4.04	222.96
								2021-09-17	3.78	3.99	223.01
MW-D26	224.50	224.57	4.31	4.39	3.05	223.23	220.19	2013-08-22	2.59	2.67	221.91
								2013-12-11	2.55	2.63	221.94
								2014-11-25	2.60	2.68	221.90
								2015-03-12	2.75	2.83	221.75
								2015-09-22	2.76	2.84	221.73
								2015-12-14	2.62	2.69	221.88
								2016-09-08	2.65	2.73	221.84
								2017-02-28	2.32	2.40	222.17
								2017-09-08	2.67	2.75	221.82
								2018-02-23	0.31	0.39	224.19
								2019-08-29	2.84	2.92	221.66
								2021-09-17	2.68	2.76	221.82
GP-D26	224.51	224.63	4.00	4.12	3.05	223.56	220.51	2013-08-22	2.70	2.81	221.81
								2013-10-11	2.66	2.77	221.86
								2013-12-13	2.55	2.67	221.96
								2014-02-25	2.68	2.80	221.83
								2014-11-27	2.57	2.68	221.94
								2015-03-12	2.75	2.86	221.76
								2015-09-22	2.76	2.88	221.75
								2015-12-14	2.61	2.72	221.91
								2017-02-28	2.30	2.41	222.22
								2017-09-08	2.68	2.79	221.84
								2018-02-23	2.58	2.70	221.93
								2018-09-04	2.79	2.90	221.73
								2019-04-01	2.71	2.82	221.81
								2019-08-29	2.83	2.95	221.68
								2020-02-14	2.69	2.80	221.83
								2021-03-03	2.75	2.86	221.77
								2021-09-17	2.68	2.79	221.83

Table B-1
Groundwater Elevations
Dyment's Creek Landfills

Well ID	Monitoring Pipe Elevation (masl)	Ground Elevation (masl)	Depth to Bottom of Well (mbmp)	Depth to Bottom of Well (mbgs)	Screen Length (m)	Top of Screen Elevation (masl)	Base of Well Elevation (masl)	Date	Depth to Groundwater (mbmp)	Depth to Groundwater (mbgs)	Groundwater Elevation (masl)
GP-D27	224.60	224.74	3.83	3.96	3.05	223.83	220.78	2013-08-22	2.39	2.53	222.21
								2013-10-11	2.45	2.58	222.15
								2013-12-13	2.39	2.53	222.21
								2014-02-25	2.57	2.71	222.03
								2014-11-25	2.45	2.58	222.15
								2015-03-12	2.55	2.68	222.05
								2015-09-21	2.53	2.66	222.07
								2015-12-14	2.49	2.62	222.12
								2017-02-28	2.16	2.29	222.44
								2017-09-08	2.31	2.44	222.29
								2018-02-23	2.32	2.46	222.28
								2018-09-04	2.50	2.63	222.10
								2019-04-01	2.45	2.58	222.16
								2019-08-29	2.50	2.63	222.10
								2020-02-14	2.47	2.60	222.13
								2021-03-03	2.35	2.48	222.26
								2021-09-17	2.33	2.46	222.27

masl = metres above sea level
mbmp = metres below monitoring pipe
mbgs = metres below ground surface

APPENDIX C

Laboratory Certificates of Analysis



Your Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 42761

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2021/02/18
Report #: R6523218
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C131838

Received: 2021/02/05, 08:42

Sample Matrix: Air
Samples Received: 3

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Hydrogen Sulfide	3	N/A	2021/02/05	CAM SOP-00220	GC/FPD
Matrix Gases (1)	1	N/A	2021/02/05	CAM SOP-00225	GC/TCD
Matrix Gases (1)	2	N/A	2021/02/08	CAM SOP-00225	GC/TCD
Volatile Organics in Air (ug/m3)	3	N/A	2021/02/05	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	3	N/A	2021/02/05	BRL SOP-00304	EPA TO-15 m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) Argon interferes with Oxygen and is included in the reported Oxygen concentration. The atmosphere contains about 0.9% Argon.

(2) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas Laboratories for a period of 5 calendar days or as contractually agreed from the date of this report, after



Your Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 42761

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2021/02/18
Report #: R6523218
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C131838

Received: 2021/02/05, 08:42

which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cristina (Maria) Bacchus, Project Manager

Email: maria.bacchus@bureauveritas.com

Phone# (905)817-5763

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This report has been generated and distributed using a secure automated process.

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



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

COMPRESSED GAS PARAMETERS (AIR)

BV Labs ID		OTV855			OTV855			OTV856		
Sampling Date		2021/02/04 14:45			2021/02/04 14:45			2021/02/04 15:15		
COC Number		42761			42761			42761		
	UNITS	GVP1	RDL	QC Batch	GVP1 Lab-Dup	RDL	QC Batch	GVP2	RDL	QC Batch
Fixed Gases										
Oxygen	% v/v	18.4	0.1	7189913	18.6	0.1	7189913	20.0	0.1	7189913
Carbon Monoxide	% v/v	<0.1	0.1	7189913	<0.1	0.1	7189913	<0.1	0.1	7189913
Methane	% v/v	<0.1	0.1	7189913	<0.1	0.1	7189913	<0.1	0.1	7189913
Carbon Dioxide	% v/v	2.7	0.1	7189913	2.7	0.1	7189913	1.5	0.1	7189913
Gas										
Hydrogen sulfide	ppmv	<0.7	0.7	7186943				<0.7	0.7	7186943
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate										

BV Labs ID		OTV856			OTV857		
Sampling Date		2021/02/04 15:15			2021/02/04 15:45		
COC Number		42761			42761		
	UNITS	GVP2 Lab-Dup	RDL	QC Batch	GVP3	RDL	QC Batch
Fixed Gases							
Oxygen	% v/v				21.8	0.1	7189913
Carbon Monoxide	% v/v				<0.1	0.1	7189913
Methane	% v/v				<0.1	0.1	7189913
Carbon Dioxide	% v/v				<0.1	0.1	7189913
Gas							
Hydrogen sulfide	ppmv	<0.7	0.7	7186943	<0.7	0.7	7186943
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (AIR)

BV Labs ID		OTV855			OTV856		OTV857		
Sampling Date		2021/02/04 14:45			2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761			42761		42761		
	UNITS	GVP1	RDL	QC Batch	GVP2	RDL	GVP3	RDL	QC Batch
Volatile Organics									
Dichlorodifluoromethane (FREON 12)	ppbv	5.49	0.40	7186850	1.63	0.40	0.51	0.40	7187940
1,2-Dichlorotetrafluoroethane	ppbv	37.3	0.34	7186850	6.55	0.34	0.40	0.34	7187940
Chloromethane	ppbv	<0.60	0.60	7186850	<0.60	0.60	<0.60	0.60	7187940
Vinyl Chloride	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Chloroethane	ppbv	<0.60	0.60	7186850	<0.60	0.60	<0.60	0.60	7187940
1,3-Butadiene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
Trichlorofluoromethane (FREON 11)	ppbv	0.49	0.40	7186850	0.61	0.40	<0.40	0.40	7187940
Ethanol (ethyl alcohol)	ppbv	179	2.0	7186850	115	2.0	84.2	2.0	7187940
Trichlorotrifluoroethane	ppbv	<0.30	0.30	7186850	<0.30	0.30	<0.30	0.30	7187940
2-propanol	ppbv	14.4	2.0	7186850	12.4	2.0	11.4	2.0	7187940
2-Propanone	ppbv	6.7	1.2	7186850	8.7	1.2	6.3	1.2	7187940
Methyl Ethyl Ketone (2-Butanone)	ppbv	<0.40	0.40	7186850	0.64	0.40	0.46	0.40	7187940
Methyl Isobutyl Ketone	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Methyl Butyl Ketone (2-Hexanone)	ppbv	<2.0	2.0	7186850	<2.0	2.0	<2.0	2.0	7187940
Methyl t-butyl ether (MTBE)	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Ethyl Acetate	ppbv	9.3	2.0	7186850	7.5	2.0	4.8	2.0	7187940
1,1-Dichloroethylene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
cis-1,2-Dichloroethylene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
trans-1,2-Dichloroethylene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Methylene Chloride(Dichloromethane)	ppbv	<1.2	1.2	7186850	<1.2	1.2	<1.2	1.2	7187940
Chloroform	ppbv	0.81	0.20	7186850	1.26	0.20	1.04	0.20	7187940
Carbon Tetrachloride	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,1-Dichloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,2-Dichloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Ethylene Dibromide	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,1,1-Trichloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,1,2-Trichloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,1,2,2-Tetrachloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
cis-1,3-Dichloropropene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
trans-1,3-Dichloropropene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,2-Dichloropropane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



BUREAU
VERITAS

BV Labs Job #: C131838

Report Date: 2021/02/18

Golder Associates Ltd

Client Project #: 11 1170 0043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (AIR)

BV Labs ID		OTV855			OTV856		OTV857		
Sampling Date		2021/02/04 14:45			2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761			42761		42761		
	UNITS	GVP1	RDL	QC Batch	GVP2	RDL	GVP3	RDL	QC Batch
Bromomethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Bromoform	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Bromodichloromethane	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Dibromochloromethane	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Trichloroethylene	ppbv	<0.20	0.20	7186850	0.30	0.20	<0.20	0.20	7187940
Tetrachloroethylene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Benzene	ppbv	0.24	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Toluene	ppbv	2.57	0.20	7186850	1.79	0.20	1.31	0.20	7187940
Ethylbenzene	ppbv	0.25	0.20	7186850	<0.20	0.20	0.21	0.20	7187940
p+m-Xylene	ppbv	0.70	0.40	7186850	0.49	0.40	0.48	0.40	7187940
o-Xylene	ppbv	0.27	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Styrene	ppbv	0.49	0.20	7186850	0.27	0.20	0.24	0.20	7187940
4-ethyltoluene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
1,3,5-Trimethylbenzene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
1,2,4-Trimethylbenzene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
Chlorobenzene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Benzyl chloride	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
1,3-Dichlorobenzene	ppbv	<0.80	0.80	7186850	<0.80	0.80	<0.80	0.80	7187940
1,4-Dichlorobenzene	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
1,2-Dichlorobenzene	ppbv	<0.20	0.20	7186850	0.37	0.20	<0.20	0.20	7187940
1,2,4-Trichlorobenzene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
Hexachlorobutadiene	ppbv	<1.0	1.0	7186850	<1.0	1.0	<1.0	1.0	7187940
Hexane	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Heptane	ppbv	1.11	0.60	7186850	0.96	0.60	<0.60	0.60	7187940
Cyclohexane	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Tetrahydrofuran	ppbv	<0.80	0.80	7186850	<0.80	0.80	<0.80	0.80	7187940
1,4-Dioxane	ppbv	<2.0	2.0	7186850	<2.0	2.0	<2.0	2.0	7187940
Naphthalene	ppbv	0.53	0.40	7186850	1.01	0.40	<0.40	0.40	7187940
Total Xylenes	ppbv	0.97	0.60	7186850	<0.60	0.60	<0.60	0.60	7187940
1,1,1,2-Tetrachloroethane	ppbv	<0.20	0.20	7186850	<0.20	0.20	<0.20	0.20	7187940
Vinyl Bromide	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Propene	ppbv	<3.7	3.7	7186850	<2.5	2.5	<1.5	1.5	7187940
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (AIR)

BV Labs ID		OTV855			OTV856		OTV857		
Sampling Date		2021/02/04 14:45			2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761			42761		42761		
	UNITS	GVP1	RDL	QC Batch	GVP2	RDL	GVP3	RDL	QC Batch
2,2,4-Trimethylpentane	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Carbon Disulfide	ppbv	<1.0	1.0	7186850	1.9	1.0	1.4	1.0	7187940
Vinyl Acetate	ppbv	<0.40	0.40	7186850	<0.40	0.40	<0.40	0.40	7187940
Surrogate Recovery (%)									
Bromochloromethane	%	82		7186850	96		98		7187940
D5-Chlorobenzene	%	85		7186850	93		93		7187940
Difluorobenzene	%	83		7186850	96		97		7187940
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



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VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (AIR)

BV Labs ID		OTV855		OTV856		OTV857		
Sampling Date		2021/02/04 14:45		2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761		42761		42761		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Calculated Parameters								
Dichlorodifluoromethane (FREON 12)	ug/m3	27.1	2.0	8.1	2.0	2.5	2.0	7186553
1,2-Dichlorotetrafluoroethane	ug/m3	261	2.4	45.8	2.4	2.8	2.4	7186553
Chloromethane	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	7186553
Vinyl Chloride	ug/m3	<0.51	0.51	<0.51	0.51	<0.51	0.51	7186553
Chloroethane	ug/m3	<1.6	1.6	<1.6	1.6	<1.6	1.6	7186553
1,3-Butadiene	ug/m3	<2.2	2.2	<2.2	2.2	<2.2	2.2	7186553
Trichlorofluoromethane (FREON 11)	ug/m3	2.7	2.2	3.4	2.2	<2.2	2.2	7186553
Ethanol (ethyl alcohol)	ug/m3	337	3.8	218	3.8	159	3.8	7186553
Trichlorotrifluoroethane	ug/m3	<2.3	2.3	<2.3	2.3	<2.3	2.3	7186553
2-propanol	ug/m3	35.5	4.9	30.4	4.9	28.0	4.9	7186553
2-Propanone	ug/m3	15.8	2.9	20.7	2.9	14.9	2.9	7186553
Methyl Ethyl Ketone (2-Butanone)	ug/m3	<1.2	1.2	1.9	1.2	1.4	1.2	7186553
Methyl Isobutyl Ketone	ug/m3	<1.6	1.6	<1.6	1.6	<1.6	1.6	7186553
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<8.2	8.2	<8.2	8.2	<8.2	8.2	7186553
Methyl t-butyl ether (MTBE)	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
Ethyl Acetate	ug/m3	33.6	7.2	27.1	7.2	17.4	7.2	7186553
1,1-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.79	0.79	7186553
cis-1,2-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.79	0.79	7186553
trans-1,2-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.79	0.79	7186553
Methylene Chloride(Dichloromethane)	ug/m3	<4.2	4.2	<4.2	4.2	<4.2	4.2	7186553
Chloroform	ug/m3	3.97	0.98	6.17	0.98	5.09	0.98	7186553
Carbon Tetrachloride	ug/m3	<1.3	1.3	<1.3	1.3	<1.3	1.3	7186553
1,1-Dichloroethane	ug/m3	<0.81	0.81	<0.81	0.81	<0.81	0.81	7186553
1,2-Dichloroethane	ug/m3	<0.81	0.81	<0.81	0.81	<0.81	0.81	7186553
Ethylene Dibromide	ug/m3	<1.5	1.5	<1.5	1.5	<1.5	1.5	7186553
1,1,1-Trichloroethane	ug/m3	<1.1	1.1	<1.1	1.1	<1.1	1.1	7186553
1,1,2-Trichloroethane	ug/m3	<1.1	1.1	<1.1	1.1	<1.1	1.1	7186553
1,1,2,2-Tetrachloroethane	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
cis-1,3-Dichloropropene	ug/m3	<0.91	0.91	<0.91	0.91	<0.91	0.91	7186553
trans-1,3-Dichloropropene	ug/m3	<0.91	0.91	<0.91	0.91	<0.91	0.91	7186553
1,2-Dichloropropane	ug/m3	<0.92	0.92	<0.92	0.92	<0.92	0.92	7186553
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (AIR)

BV Labs ID		OTV855		OTV856		OTV857		
Sampling Date		2021/02/04 14:45		2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761		42761		42761		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Bromomethane	ug/m3	<0.78	0.78	<0.78	0.78	<0.78	0.78	7186553
Bromoform	ug/m3	<4.1	4.1	<4.1	4.1	<4.1	4.1	7186553
Bromodichloromethane	ug/m3	<2.7	2.7	<2.7	2.7	<2.7	2.7	7186553
Dibromochloromethane	ug/m3	<3.4	3.4	<3.4	3.4	<3.4	3.4	7186553
Trichloroethylene	ug/m3	<1.1	1.1	1.6	1.1	<1.1	1.1	7186553
Tetrachloroethylene	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
Benzene	ug/m3	0.75	0.64	<0.64	0.64	<0.64	0.64	7186553
Toluene	ug/m3	9.69	0.75	6.74	0.75	4.95	0.75	7186553
Ethylbenzene	ug/m3	1.08	0.87	<0.87	0.87	0.92	0.87	7186553
p+m-Xylene	ug/m3	3.0	1.7	2.1	1.7	2.1	1.7	7186553
o-Xylene	ug/m3	1.18	0.87	<0.87	0.87	<0.87	0.87	7186553
Styrene	ug/m3	2.09	0.85	1.16	0.85	1.02	0.85	7186553
4-ethyltoluene	ug/m3	<4.9	4.9	<4.9	4.9	<4.9	4.9	7186553
1,3,5-Trimethylbenzene	ug/m3	<4.9	4.9	<4.9	4.9	<4.9	4.9	7186553
1,2,4-Trimethylbenzene	ug/m3	<4.9	4.9	<4.9	4.9	<4.9	4.9	7186553
Chlorobenzene	ug/m3	<0.92	0.92	<0.92	0.92	<0.92	0.92	7186553
Benzyl chloride	ug/m3	<5.2	5.2	<5.2	5.2	<5.2	5.2	7186553
1,3-Dichlorobenzene	ug/m3	<4.8	4.8	<4.8	4.8	<4.8	4.8	7186553
1,4-Dichlorobenzene	ug/m3	<1.2	1.2	<1.2	1.2	<1.2	1.2	7186553
1,2-Dichlorobenzene	ug/m3	<1.2	1.2	2.2	1.2	<1.2	1.2	7186553
1,2,4-Trichlorobenzene	ug/m3	<7.4	7.4	<7.4	7.4	<7.4	7.4	7186553
Hexachlorobutadiene	ug/m3	<11	11	<11	11	<11	11	7186553
Hexane	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
Heptane	ug/m3	4.6	2.5	3.9	2.5	<2.5	2.5	7186553
Cyclohexane	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
Tetrahydrofuran	ug/m3	<2.4	2.4	<2.4	2.4	<2.4	2.4	7186553
1,4-Dioxane	ug/m3	<7.2	7.2	<7.2	7.2	<7.2	7.2	7186553
Naphthalene	ug/m3	2.8	2.1	5.3	2.1	<2.1	2.1	7186553
Total Xylenes	ug/m3	4.2	2.6	<2.6	2.6	<2.6	2.6	7186553
1,1,1,2-Tetrachloroethane	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
Vinyl Bromide	ug/m3	<1.8	1.8	<1.8	1.8	<1.8	1.8	7186553
Propene	ug/m3	<6.4	6.4	<4.3	4.3	<2.6	2.6	7186553
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (AIR)

BV Labs ID		OTV855		OTV856		OTV857		
Sampling Date		2021/02/04 14:45		2021/02/04 15:15		2021/02/04 15:45		
COC Number		42761		42761		42761		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
2,2,4-Trimethylpentane	ug/m3	<1.9	1.9	<1.9	1.9	<1.9	1.9	7186553
Carbon Disulfide	ug/m3	<3.1	3.1	5.9	3.1	4.3	3.1	7186553
Vinyl Acetate	ug/m3	<1.4	1.4	<1.4	1.4	<1.4	1.4	7186553
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



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VERITAS

BV Labs Job #: C131838

Report Date: 2021/02/18

Golder Associates Ltd

Client Project #: 11 1170 0043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

TEST SUMMARY

BV Labs ID: OTV855

Sample ID: GVP1

Matrix: Air

Collected: 2021/02/04

Shipped:

Received: 2021/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7186943	N/A	2021/02/05	Iqbal Hasan
Matrix Gases	GC/TCD	7189913	N/A	2021/02/05	Shilpa Kataria
Volatile Organics in Air (ug/m3)	GC/MS	7186553	N/A	2021/02/05	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7186850	N/A	2021/02/05	Yao Liang Sun

BV Labs ID: OTV855 Dup

Sample ID: GVP1

Matrix: Air

Collected: 2021/02/04

Shipped:

Received: 2021/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Matrix Gases	GC/TCD	7189913	N/A	2021/02/08	Shilpa Kataria

BV Labs ID: OTV856

Sample ID: GVP2

Matrix: Air

Collected: 2021/02/04

Shipped:

Received: 2021/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7186943	N/A	2021/02/05	Iqbal Hasan
Matrix Gases	GC/TCD	7189913	N/A	2021/02/08	Shilpa Kataria
Volatile Organics in Air (ug/m3)	GC/MS	7186553	N/A	2021/02/05	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7187940	N/A	2021/02/05	Dany Marqass

BV Labs ID: OTV856 Dup

Sample ID: GVP2

Matrix: Air

Collected: 2021/02/04

Shipped:

Received: 2021/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7186943	N/A	2021/02/05	Iqbal Hasan

BV Labs ID: OTV857

Sample ID: GVP3

Matrix: Air

Collected: 2021/02/04

Shipped:

Received: 2021/02/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7186943	N/A	2021/02/05	Iqbal Hasan
Matrix Gases	GC/TCD	7189913	N/A	2021/02/08	Shilpa Kataria
Volatile Organics in Air (ug/m3)	GC/MS	7186553	N/A	2021/02/05	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7187940	N/A	2021/02/05	Dany Marqass



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VERITAS

BV Labs Job #: C131838

Report Date: 2021/02/18

Golder Associates Ltd

Client Project #: 11 1170 0043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

GENERAL COMMENTS

WS#7186850: Vinyl acetate exceeded 140% recovery in the reference standard. There were no positives found for this compound therefore the data should not be affected.

Matrix Gas Analysis: Results normalized to 100% dry volume.

WS# 7187940: 3 compounds were outside the 70-130% recovery criteria in the reference standard. These compounds meet the %RSD criteria in the continuing calibration standard. The failure of these 3 compounds is not believed to have an effect on the integrity of the results. Vinyl Acetate and Benzyl chloride exceeded 140% recovery in the reference standard. There were no positives found for this compound therefore the data should not be affected.

Sample OTV855 [GVP1] : Sample was analyzed at a 2X dilution. The DL's were adjusted accordingly.
Increased DL for propene due to interference from propane.

Sample OTV856 [GVP2] : Sample was analyzed at a 2X dilution. The DL's were adjusted accordingly.

Increased DL for Propene due to Propane interference.

Sample OTV857 [GVP3] : Sample was analyzed at a 2X dilution. The DL's were adjusted accordingly.

Increased DL for Propene due to Propane interference.

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7186553	RAE	RPD	Vinyl Chloride	2021/02/17	NC		%	25
			2-Propanone	2021/02/17	NC		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/02/17	NC		%	25
			Methyl Isobutyl Ketone	2021/02/17	NC		%	25
			Methyl t-butyl ether (MTBE)	2021/02/17	NC		%	25
			1,1-Dichloroethylene	2021/02/17	NC		%	25
			cis-1,2-Dichloroethylene	2021/02/17	NC		%	25
			trans-1,2-Dichloroethylene	2021/02/17	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/02/17	NC		%	25
			Chloroform	2021/02/17	NC		%	25
			Carbon Tetrachloride	2021/02/17	NC		%	25
			1,1-Dichloroethane	2021/02/17	NC		%	25
			1,2-Dichloroethane	2021/02/17	NC		%	25
			Ethylene Dibromide	2021/02/17	NC		%	25
			1,1,1-Trichloroethane	2021/02/17	NC		%	25
			1,1,2-Trichloroethane	2021/02/17	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/02/17	NC		%	25
			cis-1,3-Dichloropropene	2021/02/17	NC		%	25
			trans-1,3-Dichloropropene	2021/02/17	NC		%	25
			1,2-Dichloropropane	2021/02/17	NC		%	25
			Bromomethane	2021/02/17	NC		%	25
			Bromoform	2021/02/17	NC		%	25
			Trichloroethylene	2021/02/17	NC		%	25
			Tetrachloroethylene	2021/02/17	NC		%	25
			Benzene	2021/02/17	3.2		%	25
			Toluene	2021/02/17	NC		%	25
			Ethylbenzene	2021/02/17	NC		%	25
			p+m-Xylene	2021/02/17	NC		%	25
			o-Xylene	2021/02/17	NC		%	25
			Styrene	2021/02/17	NC		%	25
			Chlorobenzene	2021/02/17	NC		%	25
			1,4-Dichlorobenzene	2021/02/17	NC		%	25
			1,2-Dichlorobenzene	2021/02/17	NC		%	25
			1,2,4-Trichlorobenzene	2021/02/17	NC		%	25
			Hexachlorobutadiene	2021/02/17	NC		%	25
			Hexane	2021/02/17	2.5		%	25
			Naphthalene	2021/02/17	NC		%	25
			Total Xylenes	2021/02/17	NC		%	25
			1,1,1,2-Tetrachloroethane	2021/02/17	NC		%	25
			Vinyl Chloride	2021/02/17	NC		%	25
			2-Propanone	2021/02/17	4.3		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/02/17	NC		%	25
			Methyl Isobutyl Ketone	2021/02/17	NC		%	25
			Methyl t-butyl ether (MTBE)	2021/02/17	NC		%	25
			1,1-Dichloroethylene	2021/02/17	NC		%	25
			cis-1,2-Dichloroethylene	2021/02/17	NC		%	25
			trans-1,2-Dichloroethylene	2021/02/17	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/02/17	NC		%	25
			Chloroform	2021/02/17	NC		%	25
			Carbon Tetrachloride	2021/02/17	NC		%	25
			1,1-Dichloroethane	2021/02/17	NC		%	25



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,2-Dichloroethane	2021/02/17	NC		%	25
			Ethylene Dibromide	2021/02/17	NC		%	25
			1,1,1-Trichloroethane	2021/02/17	NC		%	25
			1,1,2-Trichloroethane	2021/02/17	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/02/17	NC		%	25
			cis-1,3-Dichloropropene	2021/02/17	NC		%	25
			trans-1,3-Dichloropropene	2021/02/17	NC		%	25
			1,2-Dichloropropane	2021/02/17	NC		%	25
			Bromomethane	2021/02/17	NC		%	25
			Bromoform	2021/02/17	NC		%	25
			Trichloroethylene	2021/02/17	NC		%	25
			Tetrachloroethylene	2021/02/17	NC		%	25
			Benzene	2021/02/17	NC		%	25
			Toluene	2021/02/17	NC		%	25
			Ethylbenzene	2021/02/17	NC		%	25
			p+m-Xylene	2021/02/17	NC		%	25
			o-Xylene	2021/02/17	NC		%	25
			Styrene	2021/02/17	NC		%	25
			Chlorobenzene	2021/02/17	NC		%	25
			1,4-Dichlorobenzene	2021/02/17	NC		%	25
			1,2-Dichlorobenzene	2021/02/17	NC		%	25
			1,2,4-Trichlorobenzene	2021/02/17	NC		%	25
			Hexachlorobutadiene	2021/02/17	NC		%	25
			Hexane	2021/02/17	NC		%	25
			Naphthalene	2021/02/17	NC		%	25
			Total Xylenes	2021/02/17	NC		%	25
			1,1,1,2-Tetrachloroethane	2021/02/17	NC		%	25
			Dichlorodifluoromethane (FREON 12)	2021/02/17	NC		%	25
			1,2-Dichlorotetrafluoroethane	2021/02/17	NC		%	25
			Chloromethane	2021/02/17	NC		%	25
			Vinyl Chloride	2021/02/17	NC		%	25
			Chloroethane	2021/02/17	NC		%	25
			1,3-Butadiene	2021/02/17	NC		%	25
			Trichlorofluoromethane (FREON 11)	2021/02/17	NC		%	25
			Ethanol (ethyl alcohol)	2021/02/17	NC		%	25
			Trichlorotrifluoroethane	2021/02/17	NC		%	25
			2-propanol	2021/02/17	NC		%	25
			2-Propanone	2021/02/17	NC		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/02/17	NC		%	25
			Methyl Isobutyl Ketone	2021/02/17	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2021/02/17	NC		%	25
			Methyl t-butyl ether (MTBE)	2021/02/17	NC		%	25
			Ethyl Acetate	2021/02/17	NC		%	25
			1,1-Dichloroethylene	2021/02/17	NC		%	25
			cis-1,2-Dichloroethylene	2021/02/17	NC		%	25
			trans-1,2-Dichloroethylene	2021/02/17	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/02/17	NC		%	25
			Chloroform	2021/02/17	NC		%	25
			Carbon Tetrachloride	2021/02/17	NC		%	25
			1,1-Dichloroethane	2021/02/17	NC		%	25
			1,2-Dichloroethane	2021/02/17	NC		%	25



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Ethylene Dibromide	2021/02/17	NC		%	25
			1,1,1-Trichloroethane	2021/02/17	NC		%	25
			1,1,2-Trichloroethane	2021/02/17	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/02/17	NC		%	25
			cis-1,3-Dichloropropene	2021/02/17	NC		%	25
			trans-1,3-Dichloropropene	2021/02/17	NC		%	25
			1,2-Dichloropropane	2021/02/17	NC		%	25
			Bromomethane	2021/02/17	NC		%	25
			Bromoform	2021/02/17	NC		%	25
			Bromodichloromethane	2021/02/17	NC		%	25
			Dibromochloromethane	2021/02/17	NC		%	25
			Trichloroethylene	2021/02/17	NC		%	25
			Tetrachloroethylene	2021/02/17	NC		%	25
			Benzene	2021/02/17	NC		%	25
			Toluene	2021/02/17	NC		%	25
			Ethylbenzene	2021/02/17	NC		%	25
			p+m-Xylene	2021/02/17	NC		%	25
			o-Xylene	2021/02/17	NC		%	25
			Styrene	2021/02/17	NC		%	25
			4-ethyltoluene	2021/02/17	NC		%	25
			1,3,5-Trimethylbenzene	2021/02/17	NC		%	25
			1,2,4-Trimethylbenzene	2021/02/17	NC		%	25
			Chlorobenzene	2021/02/17	NC		%	25
			Benzyl chloride	2021/02/17	NC		%	25
			1,3-Dichlorobenzene	2021/02/17	NC		%	25
			1,4-Dichlorobenzene	2021/02/17	NC		%	25
			1,2-Dichlorobenzene	2021/02/17	NC		%	25
			1,2,4-Trichlorobenzene	2021/02/17	NC		%	25
			Hexachlorobutadiene	2021/02/17	NC		%	25
			Hexane	2021/02/17	7.3		%	25
			Heptane	2021/02/17	NC		%	25
			Cyclohexane	2021/02/17	NC		%	25
			Tetrahydrofuran	2021/02/17	NC		%	25
			1,4-Dioxane	2021/02/17	NC		%	25
			Naphthalene	2021/02/17	NC		%	25
			Total Xylenes	2021/02/17	NC		%	25
			1,1,1,2-Tetrachloroethane	2021/02/17	NC		%	25
			Vinyl Bromide	2021/02/17	NC		%	25
			Propene	2021/02/17	NC		%	25
			2,2,4-Trimethylpentane	2021/02/17	3.6		%	25
			Carbon Disulfide	2021/02/17	NC		%	25
			Vinyl Acetate	2021/02/17	NC		%	25
7186850	LSY	Spiked Blank	Bromochloromethane	2021/02/05		97	%	60 - 140
			D5-Chlorobenzene	2021/02/05		101	%	60 - 140
			Difluorobenzene	2021/02/05		97	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/02/05		97	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2021/02/05		100	%	70 - 130
			Chloromethane	2021/02/05		95	%	70 - 130
			Vinyl Chloride	2021/02/05		99	%	70 - 130
			Chloroethane	2021/02/05		96	%	70 - 130
			1,3-Butadiene	2021/02/05		96	%	70 - 130



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Trichlorofluoromethane (FREON 11)	2021/02/05		95	%	70 - 130
			Ethanol (ethyl alcohol)	2021/02/05		68 (1)	%	70 - 130
			Trichlorotrifluoroethane	2021/02/05		99	%	70 - 130
			2-propanol	2021/02/05		102	%	70 - 130
			2-Propanone	2021/02/05		92	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/02/05		101	%	70 - 130
			Methyl Isobutyl Ketone	2021/02/05		98	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2021/02/05		96	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/02/05		99	%	70 - 130
			Ethyl Acetate	2021/02/05		94	%	70 - 130
			1,1-Dichloroethylene	2021/02/05		99	%	70 - 130
			cis-1,2-Dichloroethylene	2021/02/05		98	%	70 - 130
			trans-1,2-Dichloroethylene	2021/02/05		99	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/02/05		100	%	70 - 130
			Chloroform	2021/02/05		96	%	70 - 130
			Carbon Tetrachloride	2021/02/05		110	%	70 - 130
			1,1-Dichloroethane	2021/02/05		98	%	70 - 130
			1,2-Dichloroethane	2021/02/05		99	%	70 - 130
			Ethylene Dibromide	2021/02/05		96	%	70 - 130
			1,1,1-Trichloroethane	2021/02/05		103	%	70 - 130
			1,1,2-Trichloroethane	2021/02/05		95	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/02/05		97	%	70 - 130
			cis-1,3-Dichloropropene	2021/02/05		96	%	70 - 130
			trans-1,3-Dichloropropene	2021/02/05		102	%	70 - 130
			1,2-Dichloropropane	2021/02/05		96	%	70 - 130
			Bromomethane	2021/02/05		96	%	70 - 130
			Bromoform	2021/02/05		100	%	70 - 130
			Bromodichloromethane	2021/02/05		101	%	70 - 130
			Dibromochloromethane	2021/02/05		104	%	70 - 130
			Trichloroethylene	2021/02/05		97	%	70 - 130
			Tetrachloroethylene	2021/02/05		98	%	70 - 130
			Benzene	2021/02/05		98	%	70 - 130
			Toluene	2021/02/05		97	%	70 - 130
			Ethylbenzene	2021/02/05		93	%	70 - 130
			p+m-Xylene	2021/02/05		92	%	70 - 130
			o-Xylene	2021/02/05		93	%	70 - 130
			Styrene	2021/02/05		102	%	70 - 130
			4-ethyltoluene	2021/02/05		94	%	70 - 130
			1,3,5-Trimethylbenzene	2021/02/05		109	%	70 - 130
			1,2,4-Trimethylbenzene	2021/02/05		112	%	70 - 130
			Chlorobenzene	2021/02/05		98	%	70 - 130
			Benzyl chloride	2021/02/05		128	%	70 - 130
			1,3-Dichlorobenzene	2021/02/05		111	%	70 - 130
			1,4-Dichlorobenzene	2021/02/05		112	%	70 - 130
			1,2-Dichlorobenzene	2021/02/05		111	%	70 - 130
			1,2,4-Trichlorobenzene	2021/02/05		116	%	70 - 130
			Hexachlorobutadiene	2021/02/05		105	%	70 - 130
			Hexane	2021/02/05		94	%	70 - 130
			Heptane	2021/02/05		98	%	70 - 130
			Cyclohexane	2021/02/05		98	%	70 - 130
			Tetrahydrofuran	2021/02/05		100	%	70 - 130



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7186850	LSY	Method Blank	1,4-Dioxane	2021/02/05		93	%	70 - 130
			Naphthalene	2021/02/05		108	%	70 - 130
			Total Xylenes	2021/02/05		93	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/02/05		102	%	70 - 130
			Vinyl Bromide	2021/02/05		90	%	70 - 130
			Propene	2021/02/05		92	%	70 - 130
			2,2,4-Trimethylpentane	2021/02/05		101	%	70 - 130
			Carbon Disulfide	2021/02/05		89	%	70 - 130
			Vinyl Acetate	2021/02/05		168 (1)	%	70 - 130
			Bromochloromethane	2021/02/05		91	%	60 - 140
			D5-Chlorobenzene	2021/02/05		94	%	60 - 140
			Difluorobenzene	2021/02/05		92	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/02/05	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2021/02/05	<0.17		ppbv	
			Chloromethane	2021/02/05	<0.30		ppbv	
			Vinyl Chloride	2021/02/05	<0.10		ppbv	
			Chloroethane	2021/02/05	<0.30		ppbv	
			1,3-Butadiene	2021/02/05	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2021/02/05	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2021/02/05	<1.0		ppbv	
			Trichlorotrifluoroethane	2021/02/05	<0.15		ppbv	
			2-propanol	2021/02/05	<1.0		ppbv	
			2-Propanone	2021/02/05	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2021/02/05	<0.20		ppbv	
			Methyl Isobutyl Ketone	2021/02/05	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2021/02/05	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2021/02/05	<0.20		ppbv	
			Ethyl Acetate	2021/02/05	<1.0		ppbv	
			1,1-Dichloroethylene	2021/02/05	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2021/02/05	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2021/02/05	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2021/02/05	<0.60		ppbv	
			Chloroform	2021/02/05	<0.10		ppbv	
			Carbon Tetrachloride	2021/02/05	<0.10		ppbv	
			1,1-Dichloroethane	2021/02/05	<0.10		ppbv	
			1,2-Dichloroethane	2021/02/05	<0.10		ppbv	
			Ethylene Dibromide	2021/02/05	<0.10		ppbv	
			1,1,1-Trichloroethane	2021/02/05	<0.10		ppbv	
			1,1,2-Trichloroethane	2021/02/05	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2021/02/05	<0.10		ppbv	
			cis-1,3-Dichloropropene	2021/02/05	<0.10		ppbv	
			trans-1,3-Dichloropropene	2021/02/05	<0.10		ppbv	
			1,2-Dichloropropane	2021/02/05	<0.10		ppbv	
			Bromomethane	2021/02/05	<0.10		ppbv	
			Bromoform	2021/02/05	<0.20		ppbv	
			Bromodichloromethane	2021/02/05	<0.20		ppbv	
			Dibromochloromethane	2021/02/05	<0.20		ppbv	
			Trichloroethylene	2021/02/05	<0.10		ppbv	
			Tetrachloroethylene	2021/02/05	<0.10		ppbv	
			Benzene	2021/02/05	<0.10		ppbv	
			Toluene	2021/02/05	<0.10		ppbv	

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7186850	LSY	RPD	Ethylbenzene	2021/02/05	<0.10		ppbv	
			p+m-Xylene	2021/02/05	<0.20		ppbv	
			o-Xylene	2021/02/05	<0.10		ppbv	
			Styrene	2021/02/05	<0.10		ppbv	
			4-ethyltoluene	2021/02/05	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2021/02/05	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2021/02/05	<0.50		ppbv	
			Chlorobenzene	2021/02/05	<0.10		ppbv	
			Benzyl chloride	2021/02/05	<0.50		ppbv	
			1,3-Dichlorobenzene	2021/02/05	<0.40		ppbv	
			1,4-Dichlorobenzene	2021/02/05	<0.10		ppbv	
			1,2-Dichlorobenzene	2021/02/05	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2021/02/05	<0.50		ppbv	
			Hexachlorobutadiene	2021/02/05	<0.50		ppbv	
			Hexane	2021/02/05	<0.20		ppbv	
			Heptane	2021/02/05	<0.30		ppbv	
			Cyclohexane	2021/02/05	<0.20		ppbv	
			Tetrahydrofuran	2021/02/05	<0.40		ppbv	
			1,4-Dioxane	2021/02/05	<1.0		ppbv	
			Naphthalene	2021/02/05	<0.20		ppbv	
			Total Xylenes	2021/02/05	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2021/02/05	<0.10		ppbv	
			Vinyl Bromide	2021/02/05	<0.20		ppbv	
			Propene	2021/02/05	<0.50		ppbv	
			2,2,4-Trimethylpentane	2021/02/05	<0.20		ppbv	
			Carbon Disulfide	2021/02/05	<0.50		ppbv	
			Vinyl Acetate	2021/02/05	<0.20		ppbv	
			Dichlorodifluoromethane (FREON 12)	2021/02/05	5.5		%	25
			1,2-Dichlorotetrafluoroethane	2021/02/05	NC		%	25
			Chloromethane	2021/02/05	6.6		%	25
			Vinyl Chloride	2021/02/05	NC		%	25
			Chloroethane	2021/02/05	NC		%	25
			1,3-Butadiene	2021/02/05	NC		%	25
			Trichlorofluoromethane (FREON 11)	2021/02/05	6.5		%	25
			Ethanol (ethyl alcohol)	2021/02/05	NC		%	25
			Trichlorotrifluoroethane	2021/02/05	NC		%	25
			2-propanol	2021/02/05	NC		%	25
			2-Propanone	2021/02/05	4.0		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/02/05	1.9		%	25
			Methyl Isobutyl Ketone	2021/02/05	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2021/02/05	NC		%	25
			Methyl t-butyl ether (MTBE)	2021/02/05	NC		%	25
			Ethyl Acetate	2021/02/05	NC		%	25
			1,1-Dichloroethylene	2021/02/05	NC		%	25
			cis-1,2-Dichloroethylene	2021/02/05	NC		%	25
			trans-1,2-Dichloroethylene	2021/02/05	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/02/05	NC		%	25
			Chloroform	2021/02/05	NC		%	25
			Carbon Tetrachloride	2021/02/05	NC		%	25
			1,1-Dichloroethane	2021/02/05	NC		%	25
			1,2-Dichloroethane	2021/02/05	NC		%	25



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Ethylene Dibromide	2021/02/05	NC		%	25
			1,1,1-Trichloroethane	2021/02/05	NC		%	25
			1,1,2-Trichloroethane	2021/02/05	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/02/05	NC		%	25
			cis-1,3-Dichloropropene	2021/02/05	NC		%	25
			trans-1,3-Dichloropropene	2021/02/05	NC		%	25
			1,2-Dichloropropane	2021/02/05	NC		%	25
			Bromomethane	2021/02/05	NC		%	25
			Bromoform	2021/02/05	NC		%	25
			Bromodichloromethane	2021/02/05	NC		%	25
			Dibromochloromethane	2021/02/05	NC		%	25
			Trichloroethylene	2021/02/05	NC		%	25
			Tetrachloroethylene	2021/02/05	NC		%	25
			Benzene	2021/02/05	6.5		%	25
			Toluene	2021/02/05	0.93		%	25
			Ethylbenzene	2021/02/05	NC		%	25
			p+m-Xylene	2021/02/05	NC		%	25
			o-Xylene	2021/02/05	NC		%	25
			Styrene	2021/02/05	NC		%	25
			4-ethyltoluene	2021/02/05	NC		%	25
			1,3,5-Trimethylbenzene	2021/02/05	NC		%	25
			1,2,4-Trimethylbenzene	2021/02/05	NC		%	25
			Chlorobenzene	2021/02/05	NC		%	25
			Benzyl chloride	2021/02/05	NC		%	25
			1,3-Dichlorobenzene	2021/02/05	NC		%	25
			1,4-Dichlorobenzene	2021/02/05	NC		%	25
			1,2-Dichlorobenzene	2021/02/05	NC		%	25
			1,2,4-Trichlorobenzene	2021/02/05	NC		%	25
			Hexachlorobutadiene	2021/02/05	NC		%	25
			Hexane	2021/02/05	NC		%	25
			Heptane	2021/02/05	NC		%	25
			Cyclohexane	2021/02/05	NC		%	25
			Tetrahydrofuran	2021/02/05	NC		%	25
			1,4-Dioxane	2021/02/05	NC		%	25
			Naphthalene	2021/02/05	NC		%	25
			Total Xylenes	2021/02/05	NC		%	25
			1,1,1,2-Tetrachloroethane	2021/02/05	NC		%	25
			Vinyl Bromide	2021/02/05	NC		%	25
			Propene	2021/02/05	NC		%	25
			2,2,4-Trimethylpentane	2021/02/05	NC		%	25
			Carbon Disulfide	2021/02/05	NC		%	25
			Vinyl Acetate	2021/02/05	NC		%	25
7186943	IHO	Method Blank	Hydrogen sulfide	2021/02/05	<0.4		ppmv	
7186943	IHO	RPD [OTV856-01]	Hydrogen sulfide	2021/02/05	NC		%	20
7187940	DM2	Spiked Blank	Bromochloromethane	2021/02/05		105	%	60 - 140
			D5-Chlorobenzene	2021/02/05		106	%	60 - 140
			Difluorobenzene	2021/02/05		108	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/02/05		100	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2021/02/05		93	%	70 - 130
			Chloromethane	2021/02/05		90	%	70 - 130
			Vinyl Chloride	2021/02/05		92	%	70 - 130



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Chloroethane	2021/02/05		87	%	70 - 130
			1,3-Butadiene	2021/02/05		95	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/02/05		98	%	70 - 130
			Ethanol (ethyl alcohol)	2021/02/05		68 (1)	%	70 - 130
			Trichlorotrifluoroethane	2021/02/05		98	%	70 - 130
			2-propanol	2021/02/05		108	%	70 - 130
			2-Propanone	2021/02/05		92	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/02/05		108	%	70 - 130
			Methyl Isobutyl Ketone	2021/02/05		106	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2021/02/05		105	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/02/05		105	%	70 - 130
			Ethyl Acetate	2021/02/05		96	%	70 - 130
			1,1-Dichloroethylene	2021/02/05		99	%	70 - 130
			cis-1,2-Dichloroethylene	2021/02/05		98	%	70 - 130
			trans-1,2-Dichloroethylene	2021/02/05		101	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/02/05		101	%	70 - 130
			Chloroform	2021/02/05		95	%	70 - 130
			Carbon Tetrachloride	2021/02/05		118	%	70 - 130
			1,1-Dichloroethane	2021/02/05		99	%	70 - 130
			1,2-Dichloroethane	2021/02/05		99	%	70 - 130
			Ethylene Dibromide	2021/02/05		95	%	70 - 130
			1,1,1-Trichloroethane	2021/02/05		108	%	70 - 130
			1,1,2-Trichloroethane	2021/02/05		94	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/02/05		95	%	70 - 130
			cis-1,3-Dichloropropene	2021/02/05		100	%	70 - 130
			trans-1,3-Dichloropropene	2021/02/05		112	%	70 - 130
			1,2-Dichloropropane	2021/02/05		97	%	70 - 130
			Bromomethane	2021/02/05		88	%	70 - 130
			Bromoform	2021/02/05		100	%	70 - 130
			Bromodichloromethane	2021/02/05		100	%	70 - 130
			Dibromochloromethane	2021/02/05		106	%	70 - 130
			Trichloroethylene	2021/02/05		100	%	70 - 130
			Tetrachloroethylene	2021/02/05		100	%	70 - 130
			Benzene	2021/02/05		100	%	70 - 130
			Toluene	2021/02/05		100	%	70 - 130
			Ethylbenzene	2021/02/05		98	%	70 - 130
			p+m-Xylene	2021/02/05		99	%	70 - 130
			o-Xylene	2021/02/05		97	%	70 - 130
			Styrene	2021/02/05		108	%	70 - 130
			4-ethyltoluene	2021/02/05		99	%	70 - 130
			1,3,5-Trimethylbenzene	2021/02/05		116	%	70 - 130
			1,2,4-Trimethylbenzene	2021/02/05		123	%	70 - 130
			Chlorobenzene	2021/02/05		101	%	70 - 130
			Benzyl chloride	2021/02/05		143 (1)	%	70 - 130
			1,3-Dichlorobenzene	2021/02/05		112	%	70 - 130
			1,4-Dichlorobenzene	2021/02/05		110	%	70 - 130
			1,2-Dichlorobenzene	2021/02/05		111	%	70 - 130
			1,2,4-Trichlorobenzene	2021/02/05		114	%	70 - 130
			Hexachlorobutadiene	2021/02/05		111	%	70 - 130
			Hexane	2021/02/05		101	%	70 - 130
			Heptane	2021/02/05		107	%	70 - 130



BUREAU
VERITAS

BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7187940	DM2	Method Blank	Cyclohexane	2021/02/05		104	%	70 - 130
			Tetrahydrofuran	2021/02/05		106	%	70 - 130
			1,4-Dioxane	2021/02/05		97	%	70 - 130
			Naphthalene	2021/02/05		108	%	70 - 130
			Total Xylenes	2021/02/05		98	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/02/05		106	%	70 - 130
			Vinyl Bromide	2021/02/05		83	%	70 - 130
			Propene	2021/02/05		98	%	70 - 130
			2,2,4-Trimethylpentane	2021/02/05		104	%	70 - 130
			Carbon Disulfide	2021/02/05		87	%	70 - 130
			Vinyl Acetate	2021/02/05		180 (1)	%	70 - 130
			Bromochloromethane	2021/02/05		103	%	60 - 140
			D5-Chlorobenzene	2021/02/05		98	%	60 - 140
			Difluorobenzene	2021/02/05		103	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/02/05	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2021/02/05	<0.17		ppbv	
			Chloromethane	2021/02/05	<0.30		ppbv	
			Vinyl Chloride	2021/02/05	<0.10		ppbv	
			Chloroethane	2021/02/05	<0.30		ppbv	
			1,3-Butadiene	2021/02/05	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2021/02/05	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2021/02/05	<1.0		ppbv	
			Trichlorotrifluoroethane	2021/02/05	<0.15		ppbv	
			2-propanol	2021/02/05	<1.0		ppbv	
			2-Propanone	2021/02/05	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2021/02/05	<0.20		ppbv	
			Methyl Isobutyl Ketone	2021/02/05	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2021/02/05	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2021/02/05	<0.20		ppbv	
			Ethyl Acetate	2021/02/05	<1.0		ppbv	
			1,1-Dichloroethylene	2021/02/05	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2021/02/05	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2021/02/05	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2021/02/05	<0.60		ppbv	
			Chloroform	2021/02/05	<0.10		ppbv	
			Carbon Tetrachloride	2021/02/05	<0.10		ppbv	
			1,1-Dichloroethane	2021/02/05	<0.10		ppbv	
			1,2-Dichloroethane	2021/02/05	<0.10		ppbv	
			Ethylene Dibromide	2021/02/05	<0.10		ppbv	
			1,1,1-Trichloroethane	2021/02/05	<0.10		ppbv	
			1,1,2-Trichloroethane	2021/02/05	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2021/02/05	<0.10		ppbv	
			cis-1,3-Dichloropropene	2021/02/05	<0.10		ppbv	
			trans-1,3-Dichloropropene	2021/02/05	<0.10		ppbv	
			1,2-Dichloropropane	2021/02/05	<0.10		ppbv	
			Bromomethane	2021/02/05	<0.10		ppbv	
			Bromoform	2021/02/05	<0.20		ppbv	
			Bromodichloromethane	2021/02/05	<0.20		ppbv	
			Dibromochloromethane	2021/02/05	<0.20		ppbv	
			Trichloroethylene	2021/02/05	<0.10		ppbv	
			Tetrachloroethylene	2021/02/05	<0.10		ppbv	

BUREAU
VERITASBV Labs Job #: C131838
Report Date: 2021/02/18Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzene	2021/02/05	<0.10		ppbv	
			Toluene	2021/02/05	<0.10		ppbv	
			Ethylbenzene	2021/02/05	<0.10		ppbv	
			p+m-Xylene	2021/02/05	<0.20		ppbv	
			o-Xylene	2021/02/05	<0.10		ppbv	
			Styrene	2021/02/05	<0.10		ppbv	
			4-ethyltoluene	2021/02/05	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2021/02/05	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2021/02/05	<0.50		ppbv	
			Chlorobenzene	2021/02/05	<0.10		ppbv	
			Benzyl chloride	2021/02/05	<0.50		ppbv	
			1,3-Dichlorobenzene	2021/02/05	<0.40		ppbv	
			1,4-Dichlorobenzene	2021/02/05	<0.10		ppbv	
			1,2-Dichlorobenzene	2021/02/05	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2021/02/05	<0.50		ppbv	
			Hexachlorobutadiene	2021/02/05	<0.50		ppbv	
			Hexane	2021/02/05	<0.20		ppbv	
			Heptane	2021/02/05	<0.30		ppbv	
			Cyclohexane	2021/02/05	<0.20		ppbv	
			Tetrahydrofuran	2021/02/05	<0.40		ppbv	
			1,4-Dioxane	2021/02/05	<1.0		ppbv	
			Naphthalene	2021/02/05	<0.20		ppbv	
			Total Xylenes	2021/02/05	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2021/02/05	<0.10		ppbv	
			Vinyl Bromide	2021/02/05	<0.20		ppbv	
			Propene	2021/02/05	<0.52		ppbv	
			2,2,4-Trimethylpentane	2021/02/05	<0.20		ppbv	
			Carbon Disulfide	2021/02/05	<0.50		ppbv	
			Vinyl Acetate	2021/02/05	<0.20		ppbv	
7189913	SKT	Method Blank	Oxygen	2021/02/05	<0.1		% v/v	
			Carbon Monoxide	2021/02/05	<0.1		% v/v	
			Methane	2021/02/05	<0.1		% v/v	
			Carbon Dioxide	2021/02/05	<0.1		% v/v	
7189913	SKT	RPD [OTV855-01]	Oxygen	2021/02/08	0.76		%	20
			Carbon Monoxide	2021/02/08	NC		%	20
			Methane	2021/02/08	NC		%	20
			Carbon Dioxide	2021/02/08	0.37		%	20

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

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

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

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times \text{RDL}$).

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



BUREAU
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BV Labs Job #: C131838
Report Date: 2021/02/18

Golder Associates Ltd
Client Project #: 11 1170 0043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

VALIDATION SIGNATURE PAGE

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

Anke Macfarlane, Laboratory Manager, VOC

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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



Your Project #: 11-1170-0043
 Site Location: HWS BARRIE
 Your C.O.C. #: 826167-01-01

Attention: Dawn Hoyle

Golder Associates Ltd
 121 Commerce Park Drive
 Unit L
 Barrie, ON
 CANADA L4N 8X1

Report Date: 2021/05/25
 Report #: R6647174
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1D1709

Received: 2021/05/15, 12:13

Sample Matrix: Water
 # Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Dissolved Aluminum (0.2 u, clay free)	6	N/A	2021/05/19	CAM SOP-00447	EPA 6020B m
Alkalinity	5	N/A	2021/05/19	CAM SOP-00448	SM 23 2320 B m
Alkalinity	1	N/A	2021/05/20	CAM SOP-00448	SM 23 2320 B m
1,3-Dichloropropene Sum	7	N/A	2021/05/20		EPA 8260C m
Chloride by Automated Colourimetry	6	N/A	2021/05/19	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	5	N/A	2021/05/19	CAM SOP-00414	SM 23 2510 m
Conductivity	1	N/A	2021/05/20	CAM SOP-00414	SM 23 2510 m
Petroleum Hydrocarbons F2-F4 in Water (2)	6	2021/05/19	2021/05/20	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	6	N/A	2021/05/21	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	6	2021/05/20	2021/05/20	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	6	N/A	2021/05/19	CAM SOP-00447	EPA 6020B m
B[a]P Total Potency Equivalent (1, 3)	6	N/A	2021/05/22		CCME
PAH in Water by GC/MS (1)	6	2021/05/21	2021/05/22	AB SOP-00037/AB SOP- 00003	EPA 3510C/8270E m
Total Ammonia-N	6	N/A	2021/05/21	CAM SOP-00441	USGS I-2522-90 m
pH	5	2021/05/18	2021/05/19	CAM SOP-00413	SM 4500H+ B m
pH	1	2021/05/18	2021/05/20	CAM SOP-00413	SM 4500H+ B m
Field Measured pH (4)	6	N/A	2021/05/15		Field pH Meter
Sulphate by Automated Colourimetry	6	N/A	2021/05/19	CAM SOP-00464	EPA 375.4 m
Field Temperature (4)	6	N/A	2021/05/15		Field Thermometer
Un-ionized Ammonia	6	2021/05/17	2021/05/21	Auto Calc.	PWQO
Volatile Organic Compounds and F1 PHCs	7	N/A	2021/05/19	CAM SOP-00230	EPA 8260C m

Remarks:

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

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are



Your Project #: 11-1170-0043
Site Location: HWS BARRIE
Your C.O.C. #: 826167-01-01

Attention: Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2021/05/25
Report #: R6647174
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1D1709

Received: 2021/05/15, 12:13

reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

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

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

- (1) This test was performed by Bureau Veritas Calgary via Mississauga
- (2) All CCME PHC results met required criteria unless otherwise stated in the report. The CWS PHC methods employed by Bureau Veritas Laboratories conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following "Alberta Environment's Interpretation of the Reference Method for the Canada-Wide Standard for Petroleum Hydrocarbons in Soil Validation of Performance-Based Alternative Methods September 2003". Documentation is available upon request. Modifications from Reference Method for the Canada-wide Standard for Petroleum Hydrocarbons in Soil-Tier 1 Method: F2/F3/F4 data reported using validated cold solvent extraction instead of Soxhlet extraction.
- (3) B[a]P TPE is calculated using 1/2 of the RDL for non detect results as per Alberta Environment instructions. This protocol may not apply in other jurisdictions.
- (4) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas Laboratories.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

=====

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BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

CCME PAHS (WATER)

BV Labs ID			POT171	POT172	POT173	POT174	POT175		
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50		
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01		
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch

Polyaromatic Hydrocarbons

Benzo(a)pyrene Total Potency Equiv.	ug/L	-	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7369163
Acenaphthene	ug/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7369160
Acenaphthylene	ug/L	-	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7369160
Acridine	ug/L	-	<0.040	<0.040	<0.040	<0.040	<0.040	0.040	7369160
Anthracene	ug/L	0.0008	<0.010 (1)	<0.010 (1)	<0.010 (1)	<0.010 (1)	<0.010 (1)	0.010	7369160
Benzo(a)anthracene	ug/L	0.0004	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	0.0085	7369160
Benzo(b/j)fluoranthene	ug/L	-	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	7369160
Benzo(k)fluoranthene	ug/L	0.0002	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	0.0085	7369160
Benzo(g,h,i)perylene	ug/L	-	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	7369160
Benzo(c)phenanthrene	ug/L	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7369160
Benzo(a)pyrene	ug/L	-	<0.0075	<0.0075	<0.0075	<0.0075	<0.0075	0.0075	7369160
Benzo(e)pyrene	ug/L	-	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7369160
Chrysene	ug/L	0.0001	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	<0.0085 (1)	0.0085	7369160
Dibenzo(a,h)anthracene	ug/L	0.002	<0.0075 (1)	<0.0075 (1)	<0.0075 (1)	<0.0075 (1)	<0.0075 (1)	0.0075	7369160
Fluoranthene	ug/L	0.0008	<0.010 (1)	<0.010 (1)	<0.010 (1)	<0.010 (1)	<0.010 (1)	0.010	7369160
Fluorene	ug/L	0.2	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7369160
Indeno(1,2,3-cd)pyrene	ug/L	-	<0.0085	<0.0085	<0.0085	<0.0085	<0.0085	0.0085	7369160
1-Methylnaphthalene	ug/L	2	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7369160
2-Methylnaphthalene	ug/L	2	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7369160
Naphthalene	ug/L	7	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7369160
Phenanthrene	ug/L	0.03	<0.050 (1)	<0.050 (1)	<0.050 (1)	<0.050 (1)	<0.050 (1)	0.050	7369160
Perylene	ug/L	0.00007	<0.050 (1)	<0.050 (1)	<0.050 (1)	<0.050 (1)	<0.050 (1)	0.050	7369160
Pyrene	ug/L	-	<0.020	<0.020	<0.020	<0.020	<0.020	0.020	7369160
Quinoline	ug/L	10	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7369160

Surrogate Recovery (%)

D10-Anthracene	%	-	116	102	104	100	105		7369160
D14-Terphenyl	%	-	100	89	92	89	92		7369160
D8-Acenaphthylene	%	-	101	90	92	83	94		7369160

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Provincial Water Quality Objectives

Ref. to MOEE Water Management document dated Feb.1999

(1) RDL exceeds criteria



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

CCME PAHS (WATER)

BV Labs ID			POT171	POT172	POT173	POT174	POT175		
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50		
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01		
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch
D8-Naphthalene	%	-	72	66	67	56	73		7369160
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Provincial Water Quality Objectives									
Ref. to MOEE Water Management document dated Feb.1999									

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

CCME PAHS (WATER)

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
Polyaromatic Hydrocarbons					
Benzo(a)pyrene Total Potency Equiv.	ug/L	-	<0.010	0.010	7369163
Acenaphthene	ug/L	-	<0.10	0.10	7369160
Acenaphthylene	ug/L	-	<0.10	0.10	7369160
Acridine	ug/L	-	<0.040	0.040	7369160
Anthracene	ug/L	0.0008	<0.010 (1)	0.010	7369160
Benzo(a)anthracene	ug/L	0.0004	<0.0085 (1)	0.0085	7369160
Benzo(b/j)fluoranthene	ug/L	-	<0.0085	0.0085	7369160
Benzo(k)fluoranthene	ug/L	0.0002	<0.0085 (1)	0.0085	7369160
Benzo(g,h,i)perylene	ug/L	-	<0.0085	0.0085	7369160
Benzo(c)phenanthrene	ug/L	-	<0.050	0.050	7369160
Benzo(a)pyrene	ug/L	-	<0.0075	0.0075	7369160
Benzo(e)pyrene	ug/L	-	<0.050	0.050	7369160
Chrysene	ug/L	0.0001	<0.0085 (1)	0.0085	7369160
Dibenzo(a,h)anthracene	ug/L	0.002	<0.0075 (1)	0.0075	7369160
Fluoranthene	ug/L	0.0008	<0.010 (1)	0.010	7369160
Fluorene	ug/L	0.2	<0.050	0.050	7369160
Indeno(1,2,3-cd)pyrene	ug/L	-	<0.0085	0.0085	7369160
1-Methylnaphthalene	ug/L	2	<0.10	0.10	7369160
2-Methylnaphthalene	ug/L	2	<0.10	0.10	7369160
Naphthalene	ug/L	7	<0.10	0.10	7369160
Phenanthrene	ug/L	0.03	<0.050 (1)	0.050	7369160
Perylene	ug/L	0.00007	<0.050 (1)	0.050	7369160
Pyrene	ug/L	-	<0.020	0.020	7369160
Quinoline	ug/L	10	<0.20	0.20	7369160
Surrogate Recovery (%)					
D10-Anthracene	%	-	103		7369160
D14-Terphenyl	%	-	91		7369160
D8-Acenaphthylene	%	-	93		7369160
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					
(1) RDL exceeds criteria					



**BUREAU
VERITAS**

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

CCME PAHS (WATER)

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
D8-Naphthalene	%	-	73		7369160
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

RESULTS OF ANALYSES OF WATER

BV Labs ID			POT171		POT172		POT173		
Sampling Date			2021/05/10 09:20		2021/05/10 10:40		2021/05/10 12:20		
COC Number			826167-01-01		826167-01-01		826167-01-01		
	UNITS	Criteria	SWD-01	RDL	SWD-02	RDL	SWD-03	RDL	QC Batch
Calculated Parameters									
Hardness (CaCO3)	mg/L	-	330	1.0	330	1.0	320	1.0	7356865
Total Un-ionized Ammonia	mg/L	0.02	0.0037	0.00061	0.0059	0.00073	0.0022	0.00081	7356172
Field Measurements									
Field Temperature	Celsius	-	6.54	N/A	7.26	N/A	7.47	N/A	ONSITE
Field Measured pH	pH	6.5:8.5	7.57		7.91		7.95		ONSITE
Inorganics									
Total Ammonia-N	mg/L	-	0.59	0.050	0.40	0.050	0.14	0.050	7361311
Conductivity	umho/cm	-	1700	1.0	1700	1.0	1600	1.0	7359368
pH	pH	6.5:8.5	8.23		8.23		8.20		7359370
Dissolved Sulphate (SO4)	mg/L	-	29	1.0	28	1.0	30	1.0	7358777
Alkalinity (Total as CaCO3)	mg/L	-	280	1.0	280	1.0	280	1.0	7359357
Dissolved Chloride (Cl-)	mg/L	-	340	5.0	340	5.0	320	5.0	7358770
No Fill	No Exceedance Exceeds 1 criteria policy/level Exceeds both criteria/levels								
Grey									
Black									
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Provincial Water Quality Objectives									
Ref. to MOEE Water Management document dated Feb.1999									
N/A = Not Applicable									



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

RESULTS OF ANALYSES OF WATER

BV Labs ID			POT174		POT175		POT176											
Sampling Date			2021/05/10 10:00		2021/05/10 11:50		2021/05/10 10:10											
COC Number			826167-01-01		826167-01-01		826167-01-01											
	UNITS	Criteria	SWD-04	RDL	SWD-05	RDL	DUP-1	RDL	QC Batch									
Calculated Parameters																		
Hardness (CaCO3)	mg/L	-	330	1.0	330	1.0	330	1.0	7356865									
Total Un-ionized Ammonia	mg/L	0.02	0.0023	0.00061	0.0051	0.00085	0.0057	0.00073	7356172									
Field Measurements																		
Field Temperature	Celsius	-	7.11	N/A	7.45	N/A	7.26	N/A	ONSITE									
Field Measured pH	pH	6.5:8.5	7.34		7.97		7.91		ONSITE									
Inorganics																		
Total Ammonia-N	mg/L	-	0.60	0.050	0.30	0.050	0.39	0.050	7361311									
Conductivity	umho/cm	-	1700	1.0	1700	1.0	1700	1.0	7359368									
pH	pH	6.5:8.5	8.16		8.23		8.19		7359370									
Dissolved Sulphate (SO4)	mg/L	-	28	1.0	29	1.0	29	1.0	7358777									
Alkalinity (Total as CaCO3)	mg/L	-	290	1.0	280	1.0	280	1.0	7359357									
Dissolved Chloride (Cl-)	mg/L	-	340	5.0	340	5.0	340	5.0	7358770									
No Fill	No Exceedance																	
Grey										Exceeds 1 criteria policy/level								
Black																		
RDL = Reportable Detection Limit																		
QC Batch = Quality Control Batch																		
Criteria: Ontario Provincial Water Quality Objectives																		
Ref. to MOEE Water Management document dated Feb.1999																		
N/A = Not Applicable																		

BUREAU
VERITASBV Labs Job #: C1D1709
Report Date: 2021/05/25Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			POT171	POT172	POT173	POT174	POT175											
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50											
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01											
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch									
Metals																		
Dissolved (0.2u) Aluminum (Al)	ug/L	15	<5	<5	6	<5	5	5	7358808									
Dissolved Mercury (Hg)	ug/L	0.2	<0.10	<0.10	<0.10	<0.10	<0.10	0.10	7362941									
Total Aluminum (Al)	ug/L	-	31	21	35	93	23	4.9	7360439									
Total Antimony (Sb)	ug/L	20	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7360439									
Total Arsenic (As)	ug/L	100	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439									
Total Barium (Ba)	ug/L	-	130	130	130	140	130	2.0	7360439									
Total Beryllium (Be)	ug/L	11	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7360439									
Total Bismuth (Bi)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439									
Total Boron (B)	ug/L	200	41	41	39	38	36	10	7360439									
Total Cadmium (Cd)	ug/L	0.2	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7360439									
Total Calcium (Ca)	ug/L	-	110000	120000	120000	120000	120000	200	7360439									
Total Chromium (Cr)	ug/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7360439									
Total Cobalt (Co)	ug/L	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7360439									
Total Copper (Cu)	ug/L	5	1.4	1.3	1.4	2.3	1.6	0.90	7360439									
Total Iron (Fe)	ug/L	300	1300	1200	810	1700	1100	100	7360439									
Total Lead (Pb)	ug/L	5	<0.50	<0.50	<0.50	0.66	<0.50	0.50	7360439									
Total Lithium (Li)	ug/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7360439									
Total Magnesium (Mg)	ug/L	-	11000	11000	11000	12000	11000	50	7360439									
Total Manganese (Mn)	ug/L	-	130	140	110	150	110	2.0	7360439									
Total Molybdenum (Mo)	ug/L	40	0.77	0.59	1.7	0.68	0.62	0.50	7360439									
Total Nickel (Ni)	ug/L	25	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439									
Total Potassium (K)	ug/L	-	2800	2900	2800	2900	2900	200	7360439									
Total Selenium (Se)	ug/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7360439									
Total Silicon (Si)	ug/L	-	2700	2800	2500	2900	2700	50	7360439									
Total Silver (Ag)	ug/L	0.1	<0.090	<0.090	<0.090	<0.090	<0.090	0.090	7360439									
Total Sodium (Na)	ug/L	-	210000	220000	210000	210000	220000	100	7360439									
Total Strontium (Sr)	ug/L	-	690	740	770	750	760	1.0	7360439									
Total Tellurium (Te)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439									
Total Thallium (Tl)	ug/L	0.3	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	7360439									
No Fill	No Exceedance																	
Grey										Exceeds 1 criteria policy/level								
Black																		
RDL = Reportable Detection Limit																		
QC Batch = Quality Control Batch																		
Criteria: Ontario Provincial Water Quality Objectives																		
Ref. to MOEE Water Management document dated Feb.1999																		



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			POT171	POT172	POT173	POT174	POT175		
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50		
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01		
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch
Total Tin (Sn)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439
Total Titanium (Ti)	ug/L	-	5.5	<5.0	6.2	9.6	5.1	5.0	7360439
Total Tungsten (W)	ug/L	30	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439
Total Uranium (U)	ug/L	5	0.83	0.82	0.88	0.87	0.84	0.10	7360439
Total Vanadium (V)	ug/L	6	0.64	0.61	0.73	0.92	0.70	0.50	7360439
Total Zinc (Zn)	ug/L	30	5.0	<5.0	<5.0	8.4	<5.0	5.0	7360439
Total Zirconium (Zr)	ug/L	4	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7360439
No Fill	No Exceedance								
Grey	Exceeds 1 criteria policy/level								
Black	Exceeds both criteria/levels								
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									
Criteria: Ontario Provincial Water Quality Objectives									
Ref. to MOEE Water Management document dated Feb.1999									

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
Metals					
Dissolved (0.2u) Aluminum (Al)	ug/L	15	8	5	7358808
Dissolved Mercury (Hg)	ug/L	0.2	<0.10	0.10	7362941
Total Aluminum (Al)	ug/L	-	24	4.9	7360439
Total Antimony (Sb)	ug/L	20	<0.50	0.50	7360439
Total Arsenic (As)	ug/L	100	<1.0	1.0	7360439
Total Barium (Ba)	ug/L	-	130	2.0	7360439
Total Beryllium (Be)	ug/L	11	<0.40	0.40	7360439
Total Bismuth (Bi)	ug/L	-	<1.0	1.0	7360439
Total Boron (B)	ug/L	200	44	10	7360439
Total Cadmium (Cd)	ug/L	0.2	<0.090	0.090	7360439
Total Calcium (Ca)	ug/L	-	120000	200	7360439
Total Chromium (Cr)	ug/L	-	<5.0	5.0	7360439
Total Cobalt (Co)	ug/L	0.9	<0.50	0.50	7360439
Total Copper (Cu)	ug/L	5	1.3	0.90	7360439
Total Iron (Fe)	ug/L	300	1200	100	7360439
Total Lead (Pb)	ug/L	5	<0.50	0.50	7360439
Total Lithium (Li)	ug/L	-	<5.0	5.0	7360439
Total Magnesium (Mg)	ug/L	-	12000	50	7360439
Total Manganese (Mn)	ug/L	-	140	2.0	7360439
Total Molybdenum (Mo)	ug/L	40	0.62	0.50	7360439
Total Nickel (Ni)	ug/L	25	<1.0	1.0	7360439
Total Potassium (K)	ug/L	-	3000	200	7360439
Total Selenium (Se)	ug/L	100	<2.0	2.0	7360439
Total Silicon (Si)	ug/L	-	2800	50	7360439
Total Silver (Ag)	ug/L	0.1	<0.090	0.090	7360439
Total Sodium (Na)	ug/L	-	220000	100	7360439
Total Strontium (Sr)	ug/L	-	760	1.0	7360439
Total Tellurium (Te)	ug/L	-	<1.0	1.0	7360439
Total Thallium (Tl)	ug/L	0.3	<0.050	0.050	7360439
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					



ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
Total Tin (Sn)	ug/L	-	<1.0	1.0	7360439
Total Titanium (Ti)	ug/L	-	<5.0	5.0	7360439
Total Tungsten (W)	ug/L	30	<1.0	1.0	7360439
Total Uranium (U)	ug/L	5	0.81	0.10	7360439
Total Vanadium (V)	ug/L	6	0.64	0.50	7360439
Total Zinc (Zn)	ug/L	30	<5.0	5.0	7360439
Total Zirconium (Zr)	ug/L	4	<1.0	1.0	7360439
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID			POT177		
Sampling Date			2021/05/10 01:00		
COC Number			826167-01-01		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	-	<0.50	0.50	7356134
Volatile Organics					
Acetone (2-Propanone)	ug/L	-	<10	10	7355786
Benzene	ug/L	100	<0.20	0.20	7355786
Bromodichloromethane	ug/L	200	<0.50	0.50	7355786
Bromoform	ug/L	60	<1.0	1.0	7355786
Bromomethane	ug/L	0.9	<0.50	0.50	7355786
Carbon Tetrachloride	ug/L	-	<0.20	0.20	7355786
Chlorobenzene	ug/L	15	<0.20	0.20	7355786
Chloroform	ug/L	-	<0.20	0.20	7355786
Dibromochloromethane	ug/L	40	<0.50	0.50	7355786
1,2-Dichlorobenzene	ug/L	2.5	<0.50	0.50	7355786
1,3-Dichlorobenzene	ug/L	2.5	<0.50	0.50	7355786
1,4-Dichlorobenzene	ug/L	4	<0.50	0.50	7355786
Dichlorodifluoromethane (FREON 12)	ug/L	-	<1.0	1.0	7355786
1,1-Dichloroethane	ug/L	200	<0.20	0.20	7355786
1,2-Dichloroethane	ug/L	100	<0.50	0.50	7355786
1,1-Dichloroethylene	ug/L	40	<0.20	0.20	7355786
cis-1,2-Dichloroethylene	ug/L	200	<0.50	0.50	7355786
trans-1,2-Dichloroethylene	ug/L	200	<0.50	0.50	7355786
1,2-Dichloropropane	ug/L	0.7	<0.20	0.20	7355786
cis-1,3-Dichloropropene	ug/L	-	<0.30	0.30	7355786
trans-1,3-Dichloropropene	ug/L	7	<0.40	0.40	7355786
Ethylbenzene	ug/L	8	<0.20	0.20	7355786
Ethylene Dibromide	ug/L	5	<0.20	0.20	7355786
Hexane	ug/L	-	<1.0	1.0	7355786
Methylene Chloride(Dichloromethane)	ug/L	100	<2.0	2.0	7355786
Methyl Ethyl Ketone (2-Butanone)	ug/L	400	<10	10	7355786
Methyl Isobutyl Ketone	ug/L	-	<5.0	5.0	7355786
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID			POT177		
Sampling Date			2021/05/10 01:00		
COC Number			826167-01-01		
	UNITS	Criteria	TRIP BLANK	RDL	QC Batch
Methyl t-butyl ether (MTBE)	ug/L	200	<0.50	0.50	7355786
Styrene	ug/L	4	<0.50	0.50	7355786
1,1,1,2-Tetrachloroethane	ug/L	20	<0.50	0.50	7355786
1,1,2,2-Tetrachloroethane	ug/L	70	<0.50	0.50	7355786
Tetrachloroethylene	ug/L	50	<0.20	0.20	7355786
Toluene	ug/L	0.8	<0.20	0.20	7355786
1,1,1-Trichloroethane	ug/L	10	<0.20	0.20	7355786
1,1,2-Trichloroethane	ug/L	800	<0.50	0.50	7355786
Trichloroethylene	ug/L	20	<0.20	0.20	7355786
Trichlorofluoromethane (FREON 11)	ug/L	-	<0.50	0.50	7355786
Vinyl Chloride	ug/L	600	<0.20	0.20	7355786
p+m-Xylene	ug/L	2	<0.20	0.20	7355786
o-Xylene	ug/L	40	<0.20	0.20	7355786
Total Xylenes	ug/L	-	<0.20	0.20	7355786
F1 (C6-C10)	ug/L	-	<25	25	7355786
F1 (C6-C10) - BTEX	ug/L	-	<25	25	7355786
Surrogate Recovery (%)					
4-Bromofluorobenzene	%	-	88		7355786
D4-1,2-Dichloroethane	%	-	104		7355786
D8-Toluene	%	-	97		7355786
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

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

BV Labs ID			POT171	POT172	POT173	POT174	POT175		
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50		
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01		
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch

Calculated Parameters

1,3-Dichloropropene (cis+trans)	ug/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7356134
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Volatile Organics

Acetone (2-Propanone)	ug/L	-	<10	<10	<10	<10	<10	10	7355786
Benzene	ug/L	100	<0.20	<0.20	<0.20	0.21	<0.20	0.20	7355786
Bromodichloromethane	ug/L	200	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
Bromoform	ug/L	60	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7355786
Bromomethane	ug/L	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
Carbon Tetrachloride	ug/L	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
Chlorobenzene	ug/L	15	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
Chloroform	ug/L	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
Dibromochloromethane	ug/L	40	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
1,2-Dichlorobenzene	ug/L	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
1,3-Dichlorobenzene	ug/L	2.5	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
1,4-Dichlorobenzene	ug/L	4	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
Dichlorodifluoromethane (FREON 12)	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7355786
1,1-Dichloroethane	ug/L	200	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
1,2-Dichloroethane	ug/L	100	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
1,1-Dichloroethylene	ug/L	40	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
cis-1,2-Dichloroethylene	ug/L	200	4.3	<0.50	<0.50	4.7	<0.50	0.50	7355786
trans-1,2-Dichloroethylene	ug/L	200	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786
1,2-Dichloropropane	ug/L	0.7	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
cis-1,3-Dichloropropene	ug/L	-	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	7355786
trans-1,3-Dichloropropene	ug/L	7	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7355786
Ethylbenzene	ug/L	8	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
Ethylene Dibromide	ug/L	5	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786
Hexane	ug/L	-	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7355786
Methylene Chloride(Dichloromethane)	ug/L	100	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7355786
Methyl Ethyl Ketone (2-Butanone)	ug/L	400	<10	<10	<10	<10	<10	10	7355786
Methyl Isobutyl Ketone	ug/L	-	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7355786

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

Criteria: Ontario Provincial Water Quality Objectives

Ref. to MOEE Water Management document dated Feb.1999

BUREAU
VERITASBV Labs Job #: C1D1709
Report Date: 2021/05/25Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS**O.REG 153 VOCs BY HS & F1-F4 (WATER)**

BV Labs ID			POT171	POT172	POT173	POT174	POT175											
Sampling Date			2021/05/10 09:20	2021/05/10 10:40	2021/05/10 12:20	2021/05/10 10:00	2021/05/10 11:50											
COC Number			826167-01-01	826167-01-01	826167-01-01	826167-01-01	826167-01-01											
	UNITS	Criteria	SWD-01	SWD-02	SWD-03	SWD-04	SWD-05	RDL	QC Batch									
Methyl t-butyl ether (MTBE)	ug/L	200	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
Styrene	ug/L	4	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
1,1,1,2-Tetrachloroethane	ug/L	20	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
1,1,2,2-Tetrachloroethane	ug/L	70	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
Tetrachloroethylene	ug/L	50	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
Toluene	ug/L	0.8	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
1,1,1-Trichloroethane	ug/L	10	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
1,1,2-Trichloroethane	ug/L	800	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
Trichloroethylene	ug/L	20	3.6	0.48	<0.20	4.7	0.63	0.20	7355786									
Trichlorofluoromethane (FREON 11)	ug/L	-	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7355786									
Vinyl Chloride	ug/L	600	0.58	<0.20	<0.20	0.46	<0.20	0.20	7355786									
p+m-Xylene	ug/L	2	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
o-Xylene	ug/L	40	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
Total Xylenes	ug/L	-	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7355786									
F1 (C6-C10)	ug/L	-	<25	<25	<25	<25	<25	25	7355786									
F1 (C6-C10) - BTEX	ug/L	-	<25	<25	<25	<25	<25	25	7355786									
F2-F4 Hydrocarbons																		
F2 (C10-C16 Hydrocarbons)	ug/L	-	<100	110	<100	<100	<100	100	7359995									
F3 (C16-C34 Hydrocarbons)	ug/L	-	<200	<200	<200	<200	<200	200	7359995									
F4 (C34-C50 Hydrocarbons)	ug/L	-	<200	<200	<200	<200	<200	200	7359995									
Reached Baseline at C50	ug/L	-	Yes	Yes	Yes	Yes	Yes		7359995									
Surrogate Recovery (%)																		
o-Terphenyl	%	-	88	87	87	88	88		7359995									
4-Bromofluorobenzene	%	-	89	89	90	88	87		7355786									
D4-1,2-Dichloroethane	%	-	104	102	100	104	105		7355786									
D8-Toluene	%	-	95	96	96	95	94		7355786									
No Fill	No Exceedance																	
Grey										Exceeds 1 criteria policy/level								
Black																		
RDL = Reportable Detection Limit																		
QC Batch = Quality Control Batch																		
Criteria: Ontario Provincial Water Quality Objectives																		
Ref. to MOEE Water Management document dated Feb.1999																		



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

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

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
Calculated Parameters					
1,3-Dichloropropene (cis+trans)	ug/L	-	<0.50	0.50	7356134
Volatile Organics					
Acetone (2-Propanone)	ug/L	-	<10	10	7355786
Benzene	ug/L	100	<0.20	0.20	7355786
Bromodichloromethane	ug/L	200	<0.50	0.50	7355786
Bromoform	ug/L	60	<1.0	1.0	7355786
Bromomethane	ug/L	0.9	<0.50	0.50	7355786
Carbon Tetrachloride	ug/L	-	<0.20	0.20	7355786
Chlorobenzene	ug/L	15	<0.20	0.20	7355786
Chloroform	ug/L	-	<0.20	0.20	7355786
Dibromochloromethane	ug/L	40	<0.50	0.50	7355786
1,2-Dichlorobenzene	ug/L	2.5	<0.50	0.50	7355786
1,3-Dichlorobenzene	ug/L	2.5	<0.50	0.50	7355786
1,4-Dichlorobenzene	ug/L	4	<0.50	0.50	7355786
Dichlorodifluoromethane (FREON 12)	ug/L	-	<1.0	1.0	7355786
1,1-Dichloroethane	ug/L	200	<0.20	0.20	7355786
1,2-Dichloroethane	ug/L	100	<0.50	0.50	7355786
1,1-Dichloroethylene	ug/L	40	<0.20	0.20	7355786
cis-1,2-Dichloroethylene	ug/L	200	0.50	0.50	7355786
trans-1,2-Dichloroethylene	ug/L	200	<0.50	0.50	7355786
1,2-Dichloropropane	ug/L	0.7	<0.20	0.20	7355786
cis-1,3-Dichloropropene	ug/L	-	<0.30	0.30	7355786
trans-1,3-Dichloropropene	ug/L	7	<0.40	0.40	7355786
Ethylbenzene	ug/L	8	<0.20	0.20	7355786
Ethylene Dibromide	ug/L	5	<0.20	0.20	7355786
Hexane	ug/L	-	<1.0	1.0	7355786
Methylene Chloride(Dichloromethane)	ug/L	100	<2.0	2.0	7355786
Methyl Ethyl Ketone (2-Butanone)	ug/L	400	<10	10	7355786
Methyl Isobutyl Ketone	ug/L	-	<5.0	5.0	7355786
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

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

BV Labs ID			POT176		
Sampling Date			2021/05/10 10:10		
COC Number			826167-01-01		
	UNITS	Criteria	DUP-1	RDL	QC Batch
Methyl t-butyl ether (MTBE)	ug/L	200	<0.50	0.50	7355786
Styrene	ug/L	4	<0.50	0.50	7355786
1,1,1,2-Tetrachloroethane	ug/L	20	<0.50	0.50	7355786
1,1,2,2-Tetrachloroethane	ug/L	70	<0.50	0.50	7355786
Tetrachloroethylene	ug/L	50	<0.20	0.20	7355786
Toluene	ug/L	0.8	<0.20	0.20	7355786
1,1,1-Trichloroethane	ug/L	10	<0.20	0.20	7355786
1,1,2-Trichloroethane	ug/L	800	<0.50	0.50	7355786
Trichloroethylene	ug/L	20	0.51	0.20	7355786
Trichlorofluoromethane (FREON 11)	ug/L	-	<0.50	0.50	7355786
Vinyl Chloride	ug/L	600	<0.20	0.20	7355786
p+m-Xylene	ug/L	2	<0.20	0.20	7355786
o-Xylene	ug/L	40	<0.20	0.20	7355786
Total Xylenes	ug/L	-	<0.20	0.20	7355786
F1 (C6-C10)	ug/L	-	<25	25	7355786
F1 (C6-C10) - BTEX	ug/L	-	<25	25	7355786
F2-F4 Hydrocarbons					
F2 (C10-C16 Hydrocarbons)	ug/L	-	<100	100	7359995
F3 (C16-C34 Hydrocarbons)	ug/L	-	<200	200	7359995
F4 (C34-C50 Hydrocarbons)	ug/L	-	<200	200	7359995
Reached Baseline at C50	ug/L	-	Yes		7359995
Surrogate Recovery (%)					
o-Terphenyl	%	-	88		7359995
4-Bromofluorobenzene	%	-	88		7355786
D4-1,2-Dichloroethane	%	-	104		7355786
D8-Toluene	%	-	95		7355786
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

TEST SUMMARY

BV Labs ID: POT171
Sample ID: SWD-01
Matrix: Water

Collected: 2021/05/10
Shipped:
Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/19	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/19	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/19	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu

BV Labs ID: POT172
Sample ID: SWD-02
Matrix: Water

Collected: 2021/05/10
Shipped:
Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/19	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/19	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/19	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu



BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

TEST SUMMARY

BV Labs ID: POT173

Sample ID: SWD-03

Matrix: Water

Collected: 2021/05/10

Shipped:

Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/19	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/19	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/19	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu

BV Labs ID: POT174

Sample ID: SWD-04

Matrix: Water

Collected: 2021/05/10

Shipped:

Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/19	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/19	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/19	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu



BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

TEST SUMMARY

BV Labs ID: POT175

Sample ID: SWD-05

Matrix: Water

Collected: 2021/05/10

Shipped:

Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/20	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/20	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/20	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu

BV Labs ID: POT176

Sample ID: DUP-1

Matrix: Water

Collected: 2021/05/10

Shipped:

Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7358808	N/A	2021/05/19	Arefa Dabhad
Alkalinity	AT	7359357	N/A	2021/05/19	Surinder Rai
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Chloride by Automated Colourimetry	KONE	7358770	N/A	2021/05/19	Alina Dobreanu
Conductivity	AT	7359368	N/A	2021/05/19	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7359995	2021/05/19	2021/05/20	Ravinder Gaidhu
Hardness (calculated as CaCO ₃)		7356865	N/A	2021/05/21	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7362941	2021/05/20	2021/05/20	Meghaben Patel
Total Metals Analysis by ICPMS	ICP/MS	7360439	N/A	2021/05/19	Prempal Bhatti
B[a]P Total Potency Equivalent	GC/MS	7369163	N/A	2021/05/22	Automated Statchk
PAH in Water by GC/MS	GC/MS	7369160	2021/05/21	2021/05/22	Don Maxwell
Total Ammonia-N	LACH/NH ₄	7361311	N/A	2021/05/21	Amanpreet Sappal
pH	AT	7359370	2021/05/18	2021/05/19	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Sulphate by Automated Colourimetry	KONE	7358777	N/A	2021/05/19	Alina Dobreanu
Field Measured pH	PH	ONSITE	N/A	2021/05/15	Harwin Grewal
Un-ionized Ammonia	CALC/NH ₃	7356172	2021/05/21	2021/05/21	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu



BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

TEST SUMMARY

BV Labs ID: POT177
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2021/05/10
Shipped:
Received: 2021/05/15

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7356134	N/A	2021/05/20	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7355786	N/A	2021/05/19	Yang (Philip) Yu



BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

GENERAL COMMENTS

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

Package 1	3.3°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	7355786	YY	Matrix Spike	4-Bromofluorobenzene	2021/05/19		103	%	70 - 130
				D4-1,2-Dichloroethane	2021/05/19		104	%	70 - 130
				D8-Toluene	2021/05/19		106	%	70 - 130
				Acetone (2-Propanone)	2021/05/19		103	%	60 - 140
				Benzene	2021/05/19		96	%	70 - 130
				Bromodichloromethane	2021/05/19		104	%	70 - 130
				Bromoform	2021/05/19		101	%	70 - 130
				Bromomethane	2021/05/19		98	%	60 - 140
				Carbon Tetrachloride	2021/05/19		99	%	70 - 130
				Chlorobenzene	2021/05/19		100	%	70 - 130
				Chloroform	2021/05/19		100	%	70 - 130
				Dibromochloromethane	2021/05/19		99	%	70 - 130
				1,2-Dichlorobenzene	2021/05/19		100	%	70 - 130
				1,3-Dichlorobenzene	2021/05/19		98	%	70 - 130
				1,4-Dichlorobenzene	2021/05/19		118	%	70 - 130
				Dichlorodifluoromethane (FREON 12)	2021/05/19		88	%	60 - 140
				1,1-Dichloroethane	2021/05/19		98	%	70 - 130
				1,2-Dichloroethane	2021/05/19		98	%	70 - 130
				1,1-Dichloroethylene	2021/05/19		99	%	70 - 130
				cis-1,2-Dichloroethylene	2021/05/19		103	%	70 - 130
				trans-1,2-Dichloroethylene	2021/05/19		98	%	70 - 130
				1,2-Dichloropropane	2021/05/19		100	%	70 - 130
				cis-1,3-Dichloropropene	2021/05/19		98	%	70 - 130
				trans-1,3-Dichloropropene	2021/05/19		106	%	70 - 130
				Ethylbenzene	2021/05/19		94	%	70 - 130
				Ethylene Dibromide	2021/05/19		98	%	70 - 130
				Hexane	2021/05/19		103	%	70 - 130
				Methylene Chloride(Dichloromethane)	2021/05/19		113	%	70 - 130
				Methyl Ethyl Ketone (2-Butanone)	2021/05/19		109	%	60 - 140
				Methyl Isobutyl Ketone	2021/05/19		106	%	70 - 130
				Methyl t-butyl ether (MTBE)	2021/05/19		94	%	70 - 130
				Styrene	2021/05/19		88	%	70 - 130
				1,1,1,2-Tetrachloroethane	2021/05/19		100	%	70 - 130
				1,1,2,2-Tetrachloroethane	2021/05/19		100	%	70 - 130
				Tetrachloroethylene	2021/05/19		94	%	70 - 130
				Toluene	2021/05/19		96	%	70 - 130
				1,1,1-Trichloroethane	2021/05/19		101	%	70 - 130
				1,1,2-Trichloroethane	2021/05/19		105	%	70 - 130
				Trichloroethylene	2021/05/19		103	%	70 - 130
				Trichlorofluoromethane (FREON 11)	2021/05/19		98	%	70 - 130
				Vinyl Chloride	2021/05/19		96	%	70 - 130
				p+m-Xylene	2021/05/19		94	%	70 - 130
				o-Xylene	2021/05/19		95	%	70 - 130
				F1 (C6-C10)	2021/05/19		105	%	60 - 140
	7355786	YY	Spiked Blank	4-Bromofluorobenzene	2021/05/19		104	%	70 - 130
				D4-1,2-Dichloroethane	2021/05/19		103	%	70 - 130
				D8-Toluene	2021/05/19		106	%	70 - 130
				Acetone (2-Propanone)	2021/05/19		103	%	60 - 140
				Benzene	2021/05/19		93	%	70 - 130
				Bromodichloromethane	2021/05/19		100	%	70 - 130
				Bromoform	2021/05/19		97	%	70 - 130

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7355786	YY	Method Blank	Bromomethane	2021/05/19		95	%	60 - 140
			Carbon Tetrachloride	2021/05/19		96	%	70 - 130
			Chlorobenzene	2021/05/19		97	%	70 - 130
			Chloroform	2021/05/19		96	%	70 - 130
			Dibromochloromethane	2021/05/19		95	%	70 - 130
			1,2-Dichlorobenzene	2021/05/19		96	%	70 - 130
			1,3-Dichlorobenzene	2021/05/19		95	%	70 - 130
			1,4-Dichlorobenzene	2021/05/19		116	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2021/05/19		89	%	60 - 140
			1,1-Dichloroethane	2021/05/19		94	%	70 - 130
			1,2-Dichloroethane	2021/05/19		94	%	70 - 130
			1,1-Dichloroethylene	2021/05/19		97	%	70 - 130
			cis-1,2-Dichloroethylene	2021/05/19		100	%	70 - 130
			trans-1,2-Dichloroethylene	2021/05/19		96	%	70 - 130
			1,2-Dichloropropane	2021/05/19		97	%	70 - 130
			cis-1,3-Dichloropropene	2021/05/19		96	%	70 - 130
			trans-1,3-Dichloropropene	2021/05/19		101	%	70 - 130
			Ethylbenzene	2021/05/19		93	%	70 - 130
			Ethylene Dibromide	2021/05/19		94	%	70 - 130
			Hexane	2021/05/19		102	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/05/19		109	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/05/19		110	%	60 - 140
			Methyl Isobutyl Ketone	2021/05/19		109	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/05/19		93	%	70 - 130
			Styrene	2021/05/19		88	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/05/19		96	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/05/19		96	%	70 - 130
			Tetrachloroethylene	2021/05/19		90	%	70 - 130
			Toluene	2021/05/19		94	%	70 - 130
			1,1,1-Trichloroethane	2021/05/19		98	%	70 - 130
			1,1,2-Trichloroethane	2021/05/19		100	%	70 - 130
			Trichloroethylene	2021/05/19		101	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/05/19		95	%	70 - 130
			Vinyl Chloride	2021/05/19		95	%	70 - 130
			p+m-Xylene	2021/05/19		94	%	70 - 130
			o-Xylene	2021/05/19		95	%	70 - 130
			F1 (C6-C10)	2021/05/19		91	%	60 - 140
			4-Bromofluorobenzene	2021/05/19		94	%	70 - 130
			D4-1,2-Dichloroethane	2021/05/19		108	%	70 - 130
			D8-Toluene	2021/05/19		91	%	70 - 130
			Acetone (2-Propanone)	2021/05/19	<10		ug/L	
			Benzene	2021/05/19	<0.20		ug/L	
			Bromodichloromethane	2021/05/19	<0.50		ug/L	
			Bromoform	2021/05/19	<1.0		ug/L	
			Bromomethane	2021/05/19	<0.50		ug/L	
			Carbon Tetrachloride	2021/05/19	<0.20		ug/L	
			Chlorobenzene	2021/05/19	<0.20		ug/L	
			Chloroform	2021/05/19	<0.20		ug/L	
			Dibromochloromethane	2021/05/19	<0.50		ug/L	
			1,2-Dichlorobenzene	2021/05/19	<0.50		ug/L	
			1,3-Dichlorobenzene	2021/05/19	<0.50		ug/L	

BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			1,4-Dichlorobenzene	2021/05/19	<0.50		ug/L	
			Dichlorodifluoromethane (FREON 12)	2021/05/19	<1.0		ug/L	
			1,1-Dichloroethane	2021/05/19	<0.20		ug/L	
			1,2-Dichloroethane	2021/05/19	<0.50		ug/L	
			1,1-Dichloroethylene	2021/05/19	<0.20		ug/L	
			cis-1,2-Dichloroethylene	2021/05/19	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2021/05/19	<0.50		ug/L	
			1,2-Dichloropropane	2021/05/19	<0.20		ug/L	
			cis-1,3-Dichloropropene	2021/05/19	<0.30		ug/L	
			trans-1,3-Dichloropropene	2021/05/19	<0.40		ug/L	
			Ethylbenzene	2021/05/19	<0.20		ug/L	
			Ethylene Dibromide	2021/05/19	<0.20		ug/L	
			Hexane	2021/05/19	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2021/05/19	<2.0		ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2021/05/19	<10		ug/L	
			Methyl Isobutyl Ketone	2021/05/19	<5.0		ug/L	
			Methyl t-butyl ether (MTBE)	2021/05/19	<0.50		ug/L	
			Styrene	2021/05/19	<0.50		ug/L	
			1,1,1,2-Tetrachloroethane	2021/05/19	<0.50		ug/L	
			1,1,2,2-Tetrachloroethane	2021/05/19	<0.50		ug/L	
			Tetrachloroethylene	2021/05/19	<0.20		ug/L	
			Toluene	2021/05/19	<0.20		ug/L	
			1,1,1-Trichloroethane	2021/05/19	<0.20		ug/L	
			1,1,2-Trichloroethane	2021/05/19	<0.50		ug/L	
			Trichloroethylene	2021/05/19	<0.20		ug/L	
			Trichlorofluoromethane (FREON 11)	2021/05/19	<0.50		ug/L	
			Vinyl Chloride	2021/05/19	<0.20		ug/L	
			p+m-Xylene	2021/05/19	<0.20		ug/L	
			o-Xylene	2021/05/19	<0.20		ug/L	
			Total Xylenes	2021/05/19	<0.20		ug/L	
			F1 (C6-C10)	2021/05/19	<25		ug/L	
			F1 (C6-C10) - BTEX	2021/05/19	<25		ug/L	
7355786	YY	RPD	Benzene	2021/05/19	NC		%	30
			Ethylbenzene	2021/05/19	NC		%	30
			Methyl t-butyl ether (MTBE)	2021/05/19	NC		%	30
			Toluene	2021/05/19	NC		%	30
			p+m-Xylene	2021/05/19	NC		%	30
			o-Xylene	2021/05/19	NC		%	30
			F1 (C6-C10)	2021/05/19	NC		%	30
7358770	ADB	Matrix Spike	Dissolved Chloride (Cl-)	2021/05/19		100	%	80 - 120
7358770	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2021/05/19		102	%	80 - 120
7358770	ADB	Method Blank	Dissolved Chloride (Cl-)	2021/05/19	<1.0		mg/L	
7358770	ADB	RPD	Dissolved Chloride (Cl-)	2021/05/19	2.6		%	20
7358777	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2021/05/19		111	%	75 - 125
7358777	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2021/05/19		105	%	80 - 120
7358777	ADB	Method Blank	Dissolved Sulphate (SO4)	2021/05/19	<1.0		mg/L	
7358777	ADB	RPD	Dissolved Sulphate (SO4)	2021/05/19	5.8		%	20
7358808	ADA	Matrix Spike	Dissolved (0.2u) Aluminum (Al)	2021/05/19		101	%	80 - 120
7358808	ADA	Spiked Blank	Dissolved (0.2u) Aluminum (Al)	2021/05/19		100	%	80 - 120
7358808	ADA	Method Blank	Dissolved (0.2u) Aluminum (Al)	2021/05/19	<5		ug/L	
7358808	ADA	RPD	Dissolved (0.2u) Aluminum (Al)	2021/05/19	4.7		%	20



**BUREAU
VERITAS**

BV Labs Job #: C1D1709
Report Date: 2021/05/25

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DS

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7359357	SAU	Spiked Blank	Alkalinity (Total as CaCO ₃)	2021/05/19		97	%	85 - 115
7359357	SAU	Method Blank	Alkalinity (Total as CaCO ₃)	2021/05/19	<1.0		mg/L	
7359357	SAU	RPD	Alkalinity (Total as CaCO ₃)	2021/05/19	0.35		%	20
7359368	SAU	Spiked Blank	Conductivity	2021/05/19		100	%	85 - 115
7359368	SAU	Method Blank	Conductivity	2021/05/19	<1.0		umho/cm	
7359368	SAU	RPD	Conductivity	2021/05/19	0		%	25
7359370	SAU	Spiked Blank	pH	2021/05/19		102	%	98 - 103
7359370	SAU	RPD	pH	2021/05/19	0.11		%	N/A
7359995	RGA	Matrix Spike	o-Terphenyl	2021/05/20		88	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/05/20		89	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/05/20		97	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/05/20		101	%	60 - 130
7359995	RGA	Spiked Blank	o-Terphenyl	2021/05/19		86	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/05/19		93	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/05/19		95	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/05/19		94	%	60 - 130
7359995	RGA	Method Blank	o-Terphenyl	2021/05/19		88	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/05/19	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2021/05/19	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2021/05/19	<200		ug/L	
7359995	RGA	RPD	F2 (C10-C16 Hydrocarbons)	2021/05/20	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2021/05/20	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2021/05/20	NC		%	30
7360439	PBA	Matrix Spike	Total Aluminum (Al)	2021/05/19		104	%	80 - 120
			Total Antimony (Sb)	2021/05/19		108	%	80 - 120
			Total Arsenic (As)	2021/05/19		103	%	80 - 120
			Total Barium (Ba)	2021/05/19		98	%	80 - 120
			Total Beryllium (Be)	2021/05/19		104	%	80 - 120
			Total Bismuth (Bi)	2021/05/19		94	%	80 - 120
			Total Boron (B)	2021/05/19		100	%	80 - 120
			Total Cadmium (Cd)	2021/05/19		101	%	80 - 120
			Total Calcium (Ca)	2021/05/19		NC	%	80 - 120
			Total Chromium (Cr)	2021/05/19		101	%	80 - 120
			Total Cobalt (Co)	2021/05/19		103	%	80 - 120
			Total Copper (Cu)	2021/05/19		105	%	80 - 120
			Total Iron (Fe)	2021/05/19		101	%	80 - 120
			Total Lead (Pb)	2021/05/19		97	%	80 - 120
			Total Lithium (Li)	2021/05/19		103	%	80 - 120
			Total Magnesium (Mg)	2021/05/19		102	%	80 - 120
			Total Manganese (Mn)	2021/05/19		99	%	80 - 120
			Total Molybdenum (Mo)	2021/05/19		107	%	80 - 120
			Total Nickel (Ni)	2021/05/19		95	%	80 - 120
			Total Potassium (K)	2021/05/19		101	%	80 - 120
			Total Selenium (Se)	2021/05/19		106	%	80 - 120
			Total Silicon (Si)	2021/05/19		106	%	80 - 120
			Total Silver (Ag)	2021/05/19		97	%	80 - 120
			Total Sodium (Na)	2021/05/19		NC	%	80 - 120
			Total Strontium (Sr)	2021/05/19		NC	%	80 - 120
			Total Tellurium (Te)	2021/05/19		102	%	80 - 120
			Total Thallium (Tl)	2021/05/19		97	%	80 - 120
			Total Tin (Sn)	2021/05/19		104	%	80 - 120



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7360439	PBA	Spiked Blank	Total Titanium (Ti)	2021/05/19		98	%	80 - 120
			Total Tungsten (W)	2021/05/19		101	%	80 - 120
			Total Uranium (U)	2021/05/19		96	%	80 - 120
			Total Vanadium (V)	2021/05/19		99	%	80 - 120
			Total Zinc (Zn)	2021/05/19		101	%	80 - 120
			Total Zirconium (Zr)	2021/05/19		105	%	80 - 120
			Total Aluminum (Al)	2021/05/19		95	%	80 - 120
			Total Antimony (Sb)	2021/05/19		102	%	80 - 120
			Total Arsenic (As)	2021/05/19		98	%	80 - 120
			Total Barium (Ba)	2021/05/19		91	%	80 - 120
			Total Beryllium (Be)	2021/05/19		99	%	80 - 120
			Total Bismuth (Bi)	2021/05/19		94	%	80 - 120
			Total Boron (B)	2021/05/19		92	%	80 - 120
			Total Cadmium (Cd)	2021/05/19		98	%	80 - 120
			Total Calcium (Ca)	2021/05/19		94	%	80 - 120
			Total Chromium (Cr)	2021/05/19		96	%	80 - 120
			Total Cobalt (Co)	2021/05/19		99	%	80 - 120
			Total Copper (Cu)	2021/05/19		95	%	80 - 120
			Total Iron (Fe)	2021/05/19		97	%	80 - 120
			Total Lead (Pb)	2021/05/19		97	%	80 - 120
			Total Lithium (Li)	2021/05/19		97	%	80 - 120
			Total Magnesium (Mg)	2021/05/19		94	%	80 - 120
			Total Manganese (Mn)	2021/05/19		94	%	80 - 120
			Total Molybdenum (Mo)	2021/05/19		99	%	80 - 120
			Total Nickel (Ni)	2021/05/19		92	%	80 - 120
			Total Potassium (K)	2021/05/19		95	%	80 - 120
			Total Selenium (Se)	2021/05/19		99	%	80 - 120
			Total Silicon (Si)	2021/05/19		96	%	80 - 120
			Total Silver (Ag)	2021/05/19		95	%	80 - 120
			Total Sodium (Na)	2021/05/19		95	%	80 - 120
			Total Strontium (Sr)	2021/05/19		95	%	80 - 120
			Total Tellurium (Te)	2021/05/19		99	%	80 - 120
			Total Thallium (Tl)	2021/05/19		95	%	80 - 120
			Total Tin (Sn)	2021/05/19		97	%	80 - 120
			Total Titanium (Ti)	2021/05/19		95	%	80 - 120
			Total Tungsten (W)	2021/05/19		96	%	80 - 120
			Total Uranium (U)	2021/05/19		94	%	80 - 120
			Total Vanadium (V)	2021/05/19		93	%	80 - 120
			Total Zinc (Zn)	2021/05/19		99	%	80 - 120
			Total Zirconium (Zr)	2021/05/19		97	%	80 - 120
7360439	PBA	Method Blank	Total Aluminum (Al)	2021/05/19	<4.9		ug/L	
			Total Antimony (Sb)	2021/05/19	<0.50		ug/L	
			Total Arsenic (As)	2021/05/19	<1.0		ug/L	
			Total Barium (Ba)	2021/05/19	<2.0		ug/L	
			Total Beryllium (Be)	2021/05/19	<0.40		ug/L	
			Total Bismuth (Bi)	2021/05/19	<1.0		ug/L	
			Total Boron (B)	2021/05/19	<10		ug/L	
			Total Cadmium (Cd)	2021/05/19	<0.090		ug/L	
			Total Calcium (Ca)	2021/05/19	<200		ug/L	
			Total Chromium (Cr)	2021/05/19	<5.0		ug/L	
			Total Cobalt (Co)	2021/05/19	<0.50		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7360439	PBA	RPD	Total Copper (Cu)	2021/05/19	<0.90		ug/L	
			Total Iron (Fe)	2021/05/19	<100		ug/L	
			Total Lead (Pb)	2021/05/19	<0.50		ug/L	
			Total Lithium (Li)	2021/05/19	<5.0		ug/L	
			Total Magnesium (Mg)	2021/05/19	<50		ug/L	
			Total Manganese (Mn)	2021/05/19	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/05/19	<0.50		ug/L	
			Total Nickel (Ni)	2021/05/19	<1.0		ug/L	
			Total Potassium (K)	2021/05/19	<200		ug/L	
			Total Selenium (Se)	2021/05/19	<2.0		ug/L	
			Total Silicon (Si)	2021/05/19	<50		ug/L	
			Total Silver (Ag)	2021/05/19	<0.090		ug/L	
			Total Sodium (Na)	2021/05/19	<100		ug/L	
			Total Strontium (Sr)	2021/05/19	<1.0		ug/L	
			Total Tellurium (Te)	2021/05/19	<1.0		ug/L	
			Total Thallium (Tl)	2021/05/19	<0.050		ug/L	
			Total Tin (Sn)	2021/05/19	<1.0		ug/L	
			Total Titanium (Ti)	2021/05/19	<5.0		ug/L	
			Total Tungsten (W)	2021/05/19	<1.0		ug/L	
			Total Uranium (U)	2021/05/19	<0.10		ug/L	
			Total Vanadium (V)	2021/05/19	<0.50		ug/L	
			Total Zinc (Zn)	2021/05/19	<5.0		ug/L	
			Total Zirconium (Zr)	2021/05/19	<1.0		ug/L	
7360439	PBA	RPD	Total Aluminum (Al)	2021/05/19	5.0		%	20
			Total Cadmium (Cd)	2021/05/19	NC		%	20
			Total Chromium (Cr)	2021/05/19	NC		%	20
			Total Copper (Cu)	2021/05/19	5.5		%	20
7361311	ASP	Matrix Spike	Total Iron (Fe)	2021/05/19	1.4		%	20
			Total Lead (Pb)	2021/05/19	NC		%	20
			Total Nickel (Ni)	2021/05/19	3.2		%	20
			Total Zinc (Zn)	2021/05/19	4.3		%	20
7361311	ASP	Matrix Spike	Total Ammonia-N	2021/05/21		102	%	75 - 125
7361311	ASP	Spiked Blank	Total Ammonia-N	2021/05/21		100	%	80 - 120
7361311	ASP	Method Blank	Total Ammonia-N	2021/05/21	<0.050		mg/L	
7361311	ASP	RPD	Total Ammonia-N	2021/05/21	NC		%	20
7362941	MPD	Matrix Spike	Dissolved Mercury (Hg)	2021/05/20		97	%	75 - 125
7362941	MPD	Spiked Blank	Dissolved Mercury (Hg)	2021/05/20		96	%	80 - 120
7362941	MPD	Method Blank	Dissolved Mercury (Hg)	2021/05/20	<0.10		ug/L	
7362941	MPD	RPD	Dissolved Mercury (Hg)	2021/05/20	NC		%	20
7369160	éBG	Matrix Spike	D10-Anthracene	2021/05/22		94	%	50 - 130
			D14-Terphenyl	2021/05/22		94	%	50 - 130
			D8-Acenaphthylene	2021/05/22		6.3 (1)	%	50 - 130
			D8-Naphthalene	2021/05/22		75	%	50 - 130
			Acenaphthene	2021/05/22		36 (1)	%	50 - 130
			Acenaphthylene	2021/05/22		32 (1)	%	50 - 130
			Acridine	2021/05/22		65	%	50 - 130
			Anthracene	2021/05/22		43 (1)	%	50 - 130
			Benzo(a)anthracene	2021/05/22		74	%	50 - 130
			Benzo(b/j)fluoranthene	2021/05/22		88	%	50 - 130
			Benzo(k)fluoranthene	2021/05/22		86	%	50 - 130
			Benzo(g,h,i)perylene	2021/05/22		50	%	50 - 130



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7369160	éBG	Spiked Blank	Benzo(c)phenanthrene	2021/05/22		96	%	50 - 130
			Benzo(a)pyrene	2021/05/22		37 (1)	%	50 - 130
			Benzo(e)pyrene	2021/05/22		61	%	50 - 130
			Chrysene	2021/05/22		95	%	50 - 130
			Dibenzo(a,h)anthracene	2021/05/22		81	%	50 - 130
			Fluoranthene	2021/05/22		94	%	50 - 130
			Fluorene	2021/05/22		99	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/05/22		66	%	50 - 130
			1-Methylnaphthalene	2021/05/22		55	%	50 - 130
			2-Methylnaphthalene	2021/05/22		45 (1)	%	50 - 130
			Naphthalene	2021/05/22		90	%	50 - 130
			Phenanthrene	2021/05/22		82	%	50 - 130
			Perylene	2021/05/22		44 (1)	%	50 - 130
			Pyrene	2021/05/22		52	%	50 - 130
			Quinoline	2021/05/22		83	%	50 - 130
			D10-Anthracene	2021/05/22		100	%	50 - 130
			D14-Terphenyl	2021/05/22		83	%	50 - 130
			D8-Acenaphthylene	2021/05/22		87	%	50 - 130
			D8-Naphthalene	2021/05/22		64	%	50 - 130
			Acenaphthene	2021/05/22		87	%	50 - 130
			Acenaphthylene	2021/05/22		89	%	50 - 130
			Acridine	2021/05/22		74	%	50 - 130
			Anthracene	2021/05/22		76	%	50 - 130
			Benzo(a)anthracene	2021/05/22		98	%	50 - 130
			Benzo(b,j)fluoranthene	2021/05/22		95	%	50 - 130
			Benzo(k)fluoranthene	2021/05/22		91	%	50 - 130
			Benzo(g,h,i)perylene	2021/05/22		95	%	50 - 130
			Benzo(c)phenanthrene	2021/05/22		95	%	50 - 130
			Benzo(a)pyrene	2021/05/22		94	%	50 - 130
			Benzo(e)pyrene	2021/05/22		88	%	50 - 130
			Chrysene	2021/05/22		97	%	50 - 130
			Dibenzo(a,h)anthracene	2021/05/22		92	%	50 - 130
			Fluoranthene	2021/05/22		93	%	50 - 130
			Fluorene	2021/05/22		90	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/05/22		96	%	50 - 130
			1-Methylnaphthalene	2021/05/22		65	%	50 - 130
			2-Methylnaphthalene	2021/05/22		78	%	50 - 130
			Naphthalene	2021/05/22		81	%	50 - 130
			Phenanthrene	2021/05/22		88	%	50 - 130
			Perylene	2021/05/22		90	%	50 - 130
			Pyrene	2021/05/22		95	%	50 - 130
			Quinoline	2021/05/22		84	%	50 - 130
7369160	éBG	Method Blank	D10-Anthracene	2021/05/22		105	%	50 - 130
			D14-Terphenyl	2021/05/22		94	%	50 - 130
			D8-Acenaphthylene	2021/05/22		97	%	50 - 130
			D8-Naphthalene	2021/05/22		75	%	50 - 130
			Acenaphthene	2021/05/22	<0.10		ug/L	
			Acenaphthylene	2021/05/22	<0.10		ug/L	
			Acridine	2021/05/22	<0.040		ug/L	
			Anthracene	2021/05/22	<0.010		ug/L	
			Benzo(a)anthracene	2021/05/22	<0.0085		ug/L	



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(b,j)fluoranthene	2021/05/22	<0.0085		ug/L	
			Benzo(k)fluoranthene	2021/05/22	<0.0085		ug/L	
			Benzo(g,h,i)perylene	2021/05/22	<0.0085		ug/L	
			Benzo(c)phenanthrene	2021/05/22	<0.050		ug/L	
			Benzo(a)pyrene	2021/05/22	<0.0075		ug/L	
			Benzo(e)pyrene	2021/05/22	<0.050		ug/L	
			Chrysene	2021/05/22	<0.0085		ug/L	
			Dibenzo(a,h)anthracene	2021/05/22	<0.0075		ug/L	
			Fluoranthene	2021/05/22	<0.010		ug/L	
			Fluorene	2021/05/22	<0.050		ug/L	
			Indeno(1,2,3-cd)pyrene	2021/05/22	<0.0085		ug/L	
			1-Methylnaphthalene	2021/05/22	<0.10		ug/L	
			2-Methylnaphthalene	2021/05/22	<0.10		ug/L	
			Naphthalene	2021/05/22	<0.10		ug/L	
			Phenanthrene	2021/05/22	<0.050		ug/L	
			Perylene	2021/05/22	<0.050		ug/L	
			Pyrene	2021/05/22	<0.020		ug/L	
			Quinoline	2021/05/22	<0.20		ug/L	

N/A = Not Applicable

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

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

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

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

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

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

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

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



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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

Veronica Falk, B.Sc., P.Chem., QP, Scientific Specialist, Organics

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



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Exceedance Summary Table – Prov. Water Quality Obj.

Result Exceedances

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	UNITS
SWD-01	POT171-02	Total Iron (Fe)	300	1300	100	ug/L
SWD-02	POT172-02	Total Iron (Fe)	300	1200	100	ug/L
SWD-03	POT173-02	Total Iron (Fe)	300	810	100	ug/L
SWD-04	POT174-02	Total Iron (Fe)	300	1700	100	ug/L
SWD-05	POT175-02	Total Iron (Fe)	300	1100	100	ug/L
DUP-1	POT176-02	Total Iron (Fe)	300	1200	100	ug/L

Detection Limit Exceedances

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	UNITS
SWD-01	POT171-03	Anthracene	0.0008	<0.010	0.010	ug/L
SWD-01	POT171-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
SWD-01	POT171-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
SWD-01	POT171-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
SWD-01	POT171-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
SWD-01	POT171-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
SWD-01	POT171-03	Perylene	0.00007	<0.050	0.050	ug/L
SWD-01	POT171-03	Phenanthrene	0.03	<0.050	0.050	ug/L
SWD-02	POT172-03	Anthracene	0.0008	<0.010	0.010	ug/L
SWD-02	POT172-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
SWD-02	POT172-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
SWD-02	POT172-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
SWD-02	POT172-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
SWD-02	POT172-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
SWD-02	POT172-03	Perylene	0.00007	<0.050	0.050	ug/L
SWD-02	POT172-03	Phenanthrene	0.03	<0.050	0.050	ug/L
SWD-03	POT173-03	Anthracene	0.0008	<0.010	0.010	ug/L
SWD-03	POT173-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
SWD-03	POT173-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
SWD-03	POT173-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
SWD-03	POT173-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
SWD-03	POT173-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
SWD-03	POT173-03	Perylene	0.00007	<0.050	0.050	ug/L
SWD-03	POT173-03	Phenanthrene	0.03	<0.050	0.050	ug/L
SWD-04	POT174-03	Anthracene	0.0008	<0.010	0.010	ug/L
SWD-04	POT174-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
SWD-04	POT174-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
SWD-04	POT174-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
SWD-04	POT174-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
SWD-04	POT174-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
SWD-04	POT174-03	Perylene	0.00007	<0.050	0.050	ug/L
SWD-04	POT174-03	Phenanthrene	0.03	<0.050	0.050	ug/L
SWD-05	POT175-03	Anthracene	0.0008	<0.010	0.010	ug/L
SWD-05	POT175-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
SWD-05	POT175-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
SWD-05	POT175-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
SWD-05	POT175-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
SWD-05	POT175-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
SWD-05	POT175-03	Perylene	0.00007	<0.050	0.050	ug/L
SWD-05	POT175-03	Phenanthrene	0.03	<0.050	0.050	ug/L



BUREAU
VERITAS

BV Labs Job #: C1D1709

Report Date: 2021/05/25

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DS

Exceedance Summary Table – Prov. Water Quality Obj.

Detection Limit Exceedances

Sample ID	BV Labs ID	Parameter	Criteria	Result	DL	UNITS
DUP-1	POT176-03	Anthracene	0.0008	<0.010	0.010	ug/L
DUP-1	POT176-03	Benzo(a)anthracene	0.0004	<0.0085	0.0085	ug/L
DUP-1	POT176-03	Benzo(k)fluoranthene	0.0002	<0.0085	0.0085	ug/L
DUP-1	POT176-03	Chrysene	0.0001	<0.0085	0.0085	ug/L
DUP-1	POT176-03	Dibenzo(a,h)anthracene	0.002	<0.0075	0.0075	ug/L
DUP-1	POT176-03	Fluoranthene	0.0008	<0.010	0.010	ug/L
DUP-1	POT176-03	Perylene	0.00007	<0.050	0.050	ug/L
DUP-1	POT176-03	Phenanthrene	0.03	<0.050	0.050	ug/L

The exceedance summary table is for information purposes only and should not be considered a comprehensive listing or statement of conformance to applicable regulatory guidelines.



Your Project #: 11-1170-0043
 Site Location: HWS BARRIE
 Your C.O.C. #: 830380-09-01

Attention: Dawn Hoyle

Golder Associates Ltd
 121 Commerce Park Drive
 Unit L
 Barrie, ON
 CANADA L4N 8X1

Report Date: 2021/09/29
 Report #: R6832452
 Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1R1207

Received: 2021/09/20, 15:52

Sample Matrix: Water
 # Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum	6	N/A	2021/09/24	CAM SOP-00301	EPA 8270D m
Dissolved Aluminum (0.2 u, clay free)	6	N/A	2021/09/23	CAM SOP-00447	EPA 6020B m
Alkalinity	6	N/A	2021/09/22	CAM SOP-00448	SM 23 2320 B m
1,3-Dichloropropene Sum	6	N/A	2021/09/27		EPA 8260C m
Chloride by Automated Colourimetry	6	N/A	2021/09/22	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	6	N/A	2021/09/22	CAM SOP-00414	SM 23 2510 m
Petroleum Hydrocarbons F2-F4 in Water (1)	6	2021/09/24	2021/09/24	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	6	N/A	2021/09/23	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	4	2021/09/22	2021/09/23	CAM SOP-00453	EPA 7470A m
Dissolved Mercury in Water by CVAA	2	2021/09/23	2021/09/23	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	6	N/A	2021/09/24	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	6	N/A	2021/09/23	CAM SOP-00441	USGS I-2522-90 m
PAH Compounds in Water by GC/MS (SIM)	6	2021/09/23	2021/09/24	CAM SOP-00318	EPA 8270 m
pH	6	2021/09/22	2021/09/22	CAM SOP-00413	SM 4500H+ B m
Field Measured pH (2)	6	N/A	2021/09/20		Field pH Meter
Sulphate by Automated Colourimetry	6	N/A	2021/09/22	CAM SOP-00464	EPA 375.4 m
Field Temperature (2)	6	N/A	2021/09/20		Field Thermometer
Un-ionized Ammonia	6	2021/09/21	2021/09/23	Auto Calc.	PWQO
Volatile Organic Compounds and F1 PHCs	6	N/A	2021/09/24	CAM SOP-00230	EPA 8260C m

Remarks:

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

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



Your Project #: 11-1170-0043
Site Location: HWS BARRIE
Your C.O.C. #: 830380-09-01

Attention: Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2021/09/29
Report #: R6832452
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1R1207

Received: 2021/09/20, 15:52

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

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

(2) This is a field test, therefore, the results relate to items that were not analysed at Bureau Veritas Laboratories.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

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



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

RESULTS OF ANALYSES OF WATER

BV Labs ID		QRX479		QRX480		QRX481		QRX482		
Sampling Date		2021/09/17 03:30		2021/09/17 04:30		2021/09/17 05:30		2021/09/17 04:00		
COC Number		830380-09-01		830380-09-01		830380-09-01		830380-09-01		
	UNITS	SWD1	RDL	SWD2	RDL	SWD3	RDL	SWD4	RDL	QC Batch
Calculated Parameters										
Hardness (CaCO ₃)	mg/L	290	1.0	280	1.0	280	1.0	290	1.0	7589912
Total Un-ionized Ammonia	mg/L	0.11	0.013	0.077	0.012	0.052	0.017	0.090	0.014	7590133
Field Measurements										
Field Temperature	Celsius	17.82	N/A	18.53	N/A	19.27	N/A	18.17	N/A	ONSITE
Field Measured pH	pH	8.91		8.85		9.01		8.94		ONSITE
Inorganics										
Total Ammonia-N	mg/L	0.42	0.050	0.31	0.050	0.15	0.050	0.32	0.050	7592896
Conductivity	umho/cm	1200	1.0	1200	1.0	1200	1.0	1200	1.0	7592624
pH	pH	8.14		8.15		8.16		8.14		7592626
Dissolved Sulphate (SO ₄)	mg/L	20	1.0	21	1.0	20	1.0	20	1.0	7592635
Alkalinity (Total as CaCO ₃)	mg/L	240	1.0	230	1.0	230	1.0	240	1.0	7592614
Dissolved Chloride (Cl ⁻)	mg/L	240	3.0	240	3.0	230	3.0	240	3.0	7592627
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable										



BUREAU
VERITAS

BV Labs Job #: C1R1207

Report Date: 2021/09/29

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DP

RESULTS OF ANALYSES OF WATER

BV Labs ID		QRX483	QRX484			QRX484		
Sampling Date		2021/09/17 05:00	2021/09/17 05:00			2021/09/17 05:00		
COC Number		830380-09-01	830380-09-01			830380-09-01		
	UNITS	SWD5	SWD-DUP1	RDL	QC Batch	SWD-DUP1 Lab-Dup	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO ₃)	mg/L	280	280	1.0	7589912			
Total Un-ionized Ammonia	mg/L	0.070	0.061	0.019	7590133			
Field Measurements								
Field Temperature	Celsius	19.05	19.05	N/A	ONSITE			
Field Measured pH	pH	9.09	9.09		ONSITE			
Inorganics								
Total Ammonia-N	mg/L	0.18	0.16	0.050	7592896			
Conductivity	umho/cm	1200	1200	1.0	7592624	1200	1.0	7592624
pH	pH	8.16	8.10		7592626	8.16		7592626
Dissolved Sulphate (SO ₄)	mg/L	21	21	1.0	7592635	21	1.0	7592635
Alkalinity (Total as CaCO ₃)	mg/L	230	230	1.0	7592614	230	1.0	7592614
Dissolved Chloride (Cl ⁻)	mg/L	220	230	3.0	7592627	240	3.0	7592627
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable								

BUREAU
VERITASBV Labs Job #: C1R1207
Report Date: 2021/09/29Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX479		QRX480		QRX481	QRX482		
Sampling Date		2021/09/17 03:30		2021/09/17 04:30		2021/09/17 05:30	2021/09/17 04:00		
COC Number		830380-09-01		830380-09-01		830380-09-01	830380-09-01		
	UNITS	SWD1	QC Batch	SWD2	QC Batch	SWD3	SWD4	RDL	QC Batch

Metals

Dissolved (0.2u) Aluminum (Al)	ug/L	8	7593803	8	7593803	10	8	5	7593803
Dissolved Mercury (Hg)	ug/L	<0.10	7593074	<0.10	7595605	<0.10	<0.10	0.10	7593074
Total Aluminum (Al)	ug/L	36	7598188	36	7598188	31	37	4.9	7598188
Total Antimony (Sb)	ug/L	<0.50	7598188	<0.50	7598188	<0.50	<0.50	0.50	7598188
Total Arsenic (As)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Barium (Ba)	ug/L	120	7598188	120	7598188	120	120	2.0	7598188
Total Beryllium (Be)	ug/L	<0.40	7598188	<0.40	7598188	<0.40	<0.40	0.40	7598188
Total Bismuth (Bi)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Boron (B)	ug/L	35	7598188	36	7598188	35	35	10	7598188
Total Cadmium (Cd)	ug/L	<0.090	7598188	<0.090	7598188	<0.090	<0.090	0.090	7598188
Total Calcium (Ca)	ug/L	96000	7598188	96000	7598188	92000	98000	200	7598188
Total Chromium (Cr)	ug/L	<5.0	7598188	<5.0	7598188	<5.0	<5.0	5.0	7598188
Total Cobalt (Co)	ug/L	<0.50	7598188	<0.50	7598188	<0.50	<0.50	0.50	7598188
Total Copper (Cu)	ug/L	1.4	7598188	1.2	7598188	1.2	1.5	0.90	7598188
Total Iron (Fe)	ug/L	780	7598188	690	7598188	750	710	100	7598188
Total Lead (Pb)	ug/L	<0.50	7598188	<0.50	7598188	<0.50	<0.50	0.50	7598188
Total Lithium (Li)	ug/L	<5.0	7598188	<5.0	7598188	<5.0	<5.0	5.0	7598188
Total Magnesium (Mg)	ug/L	8400	7598188	8400	7598188	8500	8800	50	7598188
Total Manganese (Mn)	ug/L	75	7598188	61	7598188	57	73	2.0	7598188
Total Molybdenum (Mo)	ug/L	1.4	7598188	0.74	7598188	0.67	0.75	0.50	7598188
Total Nickel (Ni)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Potassium (K)	ug/L	2700	7598188	2800	7598188	2700	2800	200	7598188
Total Selenium (Se)	ug/L	<2.0	7598188	<2.0	7598188	<2.0	<2.0	2.0	7598188
Total Silicon (Si)	ug/L	3800	7598188	3900	7598188	3700	3800	50	7598188
Total Silver (Ag)	ug/L	<0.090	7598188	<0.090	7598188	<0.090	<0.090	0.090	7598188
Total Sodium (Na)	ug/L	130000	7598188	140000	7598188	140000	140000	100	7598188
Total Strontium (Sr)	ug/L	610	7598188	630	7598188	630	630	1.0	7598188
Total Tellurium (Te)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Thallium (Tl)	ug/L	<0.050	7598188	<0.050	7598188	<0.050	<0.050	0.050	7598188
Total Tin (Sn)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Titanium (Ti)	ug/L	<5.0	7598188	<5.0	7598188	<5.0	<5.0	5.0	7598188

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX479		QRX480		QRX481	QRX482		
Sampling Date		2021/09/17 03:30		2021/09/17 04:30		2021/09/17 05:30	2021/09/17 04:00		
COC Number		830380-09-01		830380-09-01		830380-09-01	830380-09-01		
	UNITS	SWD1	QC Batch	SWD2	QC Batch	SWD3	SWD4	RDL	QC Batch
Total Tungsten (W)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
Total Uranium (U)	ug/L	0.62	7598188	0.61	7598188	0.60	0.62	0.10	7598188
Total Vanadium (V)	ug/L	0.71	7598188	0.78	7598188	0.69	0.74	0.50	7598188
Total Zinc (Zn)	ug/L	<5.0	7598188	<5.0	7598188	<5.0	<5.0	5.0	7598188
Total Zirconium (Zr)	ug/L	<1.0	7598188	<1.0	7598188	<1.0	<1.0	1.0	7598188
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX483		QRX484		
Sampling Date		2021/09/17 05:00		2021/09/17 05:00		
COC Number		830380-09-01		830380-09-01		
	UNITS	SWD5	QC Batch	SWD-DUP1	RDL	QC Batch
Metals						
Dissolved (0.2u) Aluminum (Al)	ug/L	10	7593803	10	5	7593803
Dissolved Mercury (Hg)	ug/L	<0.10	7595605	<0.10	0.10	7593074
Total Aluminum (Al)	ug/L	49	7598188	49	4.9	7598188
Total Antimony (Sb)	ug/L	<0.50	7598188	<0.50	0.50	7598188
Total Arsenic (As)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Barium (Ba)	ug/L	120	7598188	120	2.0	7598188
Total Beryllium (Be)	ug/L	<0.40	7598188	<0.40	0.40	7598188
Total Bismuth (Bi)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Boron (B)	ug/L	37	7598188	37	10	7598188
Total Cadmium (Cd)	ug/L	<0.090	7598188	<0.090	0.090	7598188
Total Calcium (Ca)	ug/L	98000	7598188	100000	200	7598188
Total Chromium (Cr)	ug/L	<5.0	7598188	<5.0	5.0	7598188
Total Cobalt (Co)	ug/L	<0.50	7598188	<0.50	0.50	7598188
Total Copper (Cu)	ug/L	1.6	7598188	1.4	0.90	7598188
Total Iron (Fe)	ug/L	670	7598188	670	100	7598188
Total Lead (Pb)	ug/L	<0.50	7598188	<0.50	0.50	7598188
Total Lithium (Li)	ug/L	<5.0	7598188	<5.0	5.0	7598188
Total Magnesium (Mg)	ug/L	9100	7598188	8900	50	7598188
Total Manganese (Mn)	ug/L	61	7598188	61	2.0	7598188
Total Molybdenum (Mo)	ug/L	0.79	7598188	0.80	0.50	7598188
Total Nickel (Ni)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Potassium (K)	ug/L	2900	7598188	2900	200	7598188
Total Selenium (Se)	ug/L	<2.0	7598188	<2.0	2.0	7598188
Total Silicon (Si)	ug/L	3900	7598188	4000	50	7598188
Total Silver (Ag)	ug/L	<0.090	7598188	<0.090	0.090	7598188
Total Sodium (Na)	ug/L	150000	7598188	140000	100	7598188
Total Strontium (Sr)	ug/L	660	7598188	660	1.0	7598188
Total Tellurium (Te)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Thallium (Tl)	ug/L	<0.050	7598188	<0.050	0.050	7598188
Total Tin (Sn)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Titanium (Ti)	ug/L	<5.0	7598188	<5.0	5.0	7598188
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX483		QRX484		
Sampling Date		2021/09/17 05:00		2021/09/17 05:00		
COC Number		830380-09-01		830380-09-01		
	UNITS	SWD5	QC Batch	SWD-DUP1	RDL	QC Batch
Total Tungsten (W)	ug/L	<1.0	7598188	<1.0	1.0	7598188
Total Uranium (U)	ug/L	0.64	7598188	0.66	0.10	7598188
Total Vanadium (V)	ug/L	0.88	7598188	0.89	0.50	7598188
Total Zinc (Zn)	ug/L	5.6	7598188	<5.0	5.0	7598188
Total Zirconium (Zr)	ug/L	<1.0	7598188	<1.0	1.0	7598188
RDL = Reportable Detection Limit QC Batch = Quality Control Batch						



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		QRX479	QRX480	QRX481	QRX482	QRX483	QRX484		
Sampling Date		2021/09/17 03:30	2021/09/17 04:30	2021/09/17 05:30	2021/09/17 04:00	2021/09/17 05:00	2021/09/17 05:00		
COC Number		830380-09-01	830380-09-01	830380-09-01	830380-09-01	830380-09-01	830380-09-01		
	UNITS	SWD1	SWD2	SWD3	SWD4	SWD5	SWD-DUP1	RDL	QC Batch

Calculated Parameters									
Methylnaphthalene, 2-(1-)	ug/L	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.014	7591192
Polycyclic Aromatic Hydrocarbons									
Acenaphthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Acenaphthylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Benzo(a)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Benzo(a)pyrene	ug/L	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	0.0090	7596771
Benzo(b,j)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Benzo(g,h,i)perylene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Benzo(k)fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Chrysene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Dibenzo(a,h)anthracene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Fluoranthene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Fluorene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
1-Methylnaphthalene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
2-Methylnaphthalene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Naphthalene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Phenanthrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Pyrene	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	7596771
Surrogate Recovery (%)									
D10-Anthracene	%	92	95	92	90	90	94		7596771
D14-Terphenyl (FS)	%	86	91	93	88	85	90		7596771
D8-Acenaphthylene	%	77	78	79	72	76	78		7596771

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

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

BV Labs ID		QRX479	QRX480	QRX481	QRX482	QRX483		
Sampling Date		2021/09/17 03:30	2021/09/17 04:30	2021/09/17 05:30	2021/09/17 04:00	2021/09/17 05:00		
COC Number		830380-09-01	830380-09-01	830380-09-01	830380-09-01	830380-09-01		
	UNITS	SWD1	SWD2	SWD3	SWD4	SWD5	RDL	QC Batch
Calculated Parameters								
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7589999
Volatile Organics								
Acetone (2-Propanone)	ug/L	<10	<10	<10	<10	<10	10	7592471
Benzene	ug/L	<0.17	<0.17	0.23	<0.17	<0.17	0.17	7592471
Bromodichloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Bromoform	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7592471
Bromomethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Carbon Tetrachloride	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Chlorobenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Chloroform	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Dibromochloromethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,2-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,3-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,4-Dichlorobenzene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7592471
1,1-Dichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
1,2-Dichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,1-Dichloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
cis-1,2-Dichloroethylene	ug/L	4.6	2.1	<0.50	5.2	<0.50	0.50	7592471
trans-1,2-Dichloroethylene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,2-Dichloropropane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
cis-1,3-Dichloropropene	ug/L	<0.30	<0.30	<0.30	<0.30	<0.30	0.30	7592471
trans-1,3-Dichloropropene	ug/L	<0.40	<0.40	<0.40	<0.40	<0.40	0.40	7592471
Ethylbenzene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Ethylene Dibromide	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Hexane	ug/L	<1.0	<1.0	<1.0	<1.0	<1.0	1.0	7592471
Methylene Chloride(Dichloromethane)	ug/L	<2.0	<2.0	<2.0	<2.0	<2.0	2.0	7592471
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	<10	<10	<10	<10	10	7592471
Methyl Isobutyl Ketone	ug/L	<5.0	<5.0	<5.0	<5.0	<5.0	5.0	7592471
Methyl t-butyl ether (MTBE)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Styrene	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

BUREAU
VERITASBV Labs Job #: C1R1207
Report Date: 2021/09/29Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP**O.REG 153 VOCs BY HS & F1-F4 (WATER)**

BV Labs ID		QRX479	QRX480	QRX481	QRX482	QRX483		
Sampling Date		2021/09/17 03:30	2021/09/17 04:30	2021/09/17 05:30	2021/09/17 04:00	2021/09/17 05:00		
COC Number		830380-09-01	830380-09-01	830380-09-01	830380-09-01	830380-09-01		
	UNITS	SWD1	SWD2	SWD3	SWD4	SWD5	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
1,1,2,2-Tetrachloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Tetrachloroethylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Toluene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
1,1,1-Trichloroethane	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
1,1,2-Trichloroethane	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Trichloroethylene	ug/L	4.5	1.5	<0.20	5.3	0.59	0.20	7592471
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	7592471
Vinyl Chloride	ug/L	0.66	0.34	<0.20	0.56	<0.20	0.20	7592471
p+m-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
o-Xylene	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
Total Xylenes	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	7592471
F1 (C6-C10)	ug/L	<25	<25	<25	<25	<25	25	7592471
F1 (C6-C10) - BTEX	ug/L	<25	<25	<25	<25	<25	25	7592471
F2-F4 Hydrocarbons								
F2 (C10-C16 Hydrocarbons)	ug/L	<100	<100	<100	<100	<100	100	7597851
F3 (C16-C34 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	7597851
F4 (C34-C50 Hydrocarbons)	ug/L	<200	<200	<200	<200	<200	200	7597851
Reached Baseline at C50	ug/L	Yes	Yes	Yes	Yes	Yes		7597851
Surrogate Recovery (%)								
o-Terphenyl	%	91	90	89	89	89		7597851
4-Bromofluorobenzene	%	85	88	86	87	84		7592471
D4-1,2-Dichloroethane	%	104	118	111	119	110		7592471
D8-Toluene	%	103	101	102	96	98		7592471
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



BUREAU
VERITAS

BV Labs Job #: C1R1207

Report Date: 2021/09/29

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DP

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

BV Labs ID		QRX484		
Sampling Date		2021/09/17 05:00		
COC Number		830380-09-01		
	UNITS	SWD-DUP1	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	759999
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7592471
Benzene	ug/L	<0.17	0.17	7592471
Bromodichloromethane	ug/L	<0.50	0.50	7592471
Bromoform	ug/L	<1.0	1.0	7592471
Bromomethane	ug/L	<0.50	0.50	7592471
Carbon Tetrachloride	ug/L	<0.20	0.20	7592471
Chlorobenzene	ug/L	<0.20	0.20	7592471
Chloroform	ug/L	<0.20	0.20	7592471
Dibromochloromethane	ug/L	<0.50	0.50	7592471
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7592471
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7592471
1,1-Dichloroethane	ug/L	<0.20	0.20	7592471
1,2-Dichloroethane	ug/L	<0.50	0.50	7592471
1,1-Dichloroethylene	ug/L	<0.20	0.20	7592471
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
1,2-Dichloropropane	ug/L	<0.20	0.20	7592471
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7592471
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7592471
Ethylbenzene	ug/L	<0.20	0.20	7592471
Ethylene Dibromide	ug/L	<0.20	0.20	7592471
Hexane	ug/L	<1.0	1.0	7592471
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7592471
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7592471
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7592471
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7592471
Styrene	ug/L	<0.50	0.50	7592471
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

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

BV Labs ID		QRX484		
Sampling Date		2021/09/17 05:00		
COC Number		830380-09-01		
	UNITS	SWD-DUP1	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
Tetrachloroethylene	ug/L	<0.20	0.20	7592471
Toluene	ug/L	<0.20	0.20	7592471
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7592471
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7592471
Trichloroethylene	ug/L	0.59	0.20	7592471
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7592471
Vinyl Chloride	ug/L	<0.20	0.20	7592471
p+m-Xylene	ug/L	<0.20	0.20	7592471
o-Xylene	ug/L	<0.20	0.20	7592471
Total Xylenes	ug/L	<0.20	0.20	7592471
F1 (C6-C10)	ug/L	<25	25	7592471
F1 (C6-C10) - BTEX	ug/L	<25	25	7592471
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7597851
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	7597851
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7597851
Reached Baseline at C50	ug/L	Yes		7597851
Surrogate Recovery (%)				
o-Terphenyl	%	89		7597851
4-Bromofluorobenzene	%	83		7592471
D4-1,2-Dichloroethane	%	109		7592471
D8-Toluene	%	100		7592471
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

BUREAU
VERITASBV Labs Job #: C1R1207
Report Date: 2021/09/29Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

TEST SUMMARY

BV Labs ID: QRX479
Sample ID: SWD1
Matrix: WaterCollected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7593074	2021/09/22	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon

BV Labs ID: QRX480
Sample ID: SWD2
Matrix: WaterCollected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7595605	2021/09/23	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

TEST SUMMARY

BV Labs ID: QRX481
Sample ID: SWD3
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7593074	2021/09/22	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon

BV Labs ID: QRX482
Sample ID: SWD4
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7593074	2021/09/22	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

TEST SUMMARY

BV Labs ID: QRX483
Sample ID: SWD5
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7595605	2021/09/23	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon

BV Labs ID: QRX484
Sample ID: SWD-DUP1
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO3)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7593074	2021/09/22	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH4	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Field Measured pH	PH	ONSITE	N/A	2021/09/20	Ankita Bhalla
Un-ionized Ammonia	CALC/NH3	7590133	2021/09/23	2021/09/23	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/24	Blair Gannon



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

TEST SUMMARY

BV Labs ID: QRX484 Dup
Sample ID: SWD-DUP1
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan



GENERAL COMMENTS

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

Package 1	5.0°C
Package 2	8.0°C
Package 3	8.0°C

Revised report (2021/09/29): Split report as per client request.

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7592471	BG1	Matrix Spike	4-Bromofluorobenzene	2021/09/24		100	%	70 - 130	
			D4-1,2-Dichloroethane	2021/09/24		103	%	70 - 130	
			D8-Toluene	2021/09/24		105	%	70 - 130	
			Acetone (2-Propanone)	2021/09/24		98	%	60 - 140	
			Benzene	2021/09/24		86	%	70 - 130	
			Bromodichloromethane	2021/09/24		100	%	70 - 130	
			Bromoform	2021/09/24		95	%	70 - 130	
			Bromomethane	2021/09/24		92	%	60 - 140	
			Carbon Tetrachloride	2021/09/24		97	%	70 - 130	
			Chlorobenzene	2021/09/24		99	%	70 - 130	
			Chloroform	2021/09/24		97	%	70 - 130	
			Dibromochloromethane	2021/09/24		98	%	70 - 130	
			1,2-Dichlorobenzene	2021/09/24		98	%	70 - 130	
			1,3-Dichlorobenzene	2021/09/24		106	%	70 - 130	
			1,4-Dichlorobenzene	2021/09/24		101	%	70 - 130	
			Dichlorodifluoromethane (FREON 12)	2021/09/24		125	%	60 - 140	
			1,1-Dichloroethane	2021/09/24		93	%	70 - 130	
			1,2-Dichloroethane	2021/09/24		97	%	70 - 130	
			1,1-Dichloroethylene	2021/09/24		99	%	70 - 130	
			cis-1,2-Dichloroethylene	2021/09/24		94	%	70 - 130	
			trans-1,2-Dichloroethylene	2021/09/24		93	%	70 - 130	
			1,2-Dichloropropane	2021/09/24		97	%	70 - 130	
			cis-1,3-Dichloropropene	2021/09/24		94	%	70 - 130	
			trans-1,3-Dichloropropene	2021/09/24		106	%	70 - 130	
			Ethylbenzene	2021/09/24		94	%	70 - 130	
			Ethylene Dibromide	2021/09/24		96	%	70 - 130	
			Hexane	2021/09/24		101	%	70 - 130	
			Methylene Chloride(Dichloromethane)	2021/09/24		98	%	70 - 130	
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24		103	%	60 - 140	
			Methyl Isobutyl Ketone	2021/09/24		77	%	70 - 130	
			Methyl t-butyl ether (MTBE)	2021/09/24		91	%	70 - 130	
			Styrene	2021/09/24		81	%	70 - 130	
			1,1,1,2-Tetrachloroethane	2021/09/24		99	%	70 - 130	
			1,1,2,2-Tetrachloroethane	2021/09/24		98	%	70 - 130	
			Tetrachloroethylene	2021/09/24		93	%	70 - 130	
			Toluene	2021/09/24		99	%	70 - 130	
			1,1,1-Trichloroethane	2021/09/24		99	%	70 - 130	
			1,1,2-Trichloroethane	2021/09/24		109	%	70 - 130	
			Trichloroethylene	2021/09/24		99	%	70 - 130	
			Trichlorofluoromethane (FREON 11)	2021/09/24		98	%	70 - 130	
			Vinyl Chloride	2021/09/24		118	%	70 - 130	
			p+m-Xylene	2021/09/24		94	%	70 - 130	
			o-Xylene	2021/09/24		91	%	70 - 130	
			F1 (C6-C10)	2021/09/24		94	%	60 - 140	
7592471	BG1	Spiked Blank	4-Bromofluorobenzene	2021/09/24		99	%	70 - 130	
			D4-1,2-Dichloroethane	2021/09/24		104	%	70 - 130	
			D8-Toluene	2021/09/24		106	%	70 - 130	
			Acetone (2-Propanone)	2021/09/24		96	%	60 - 140	
			Benzene	2021/09/24		89	%	70 - 130	
			Bromodichloromethane	2021/09/24		103	%	70 - 130	
			Bromoform	2021/09/24		95	%	70 - 130	



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7592471	BG1	Method Blank	Bromomethane	2021/09/24		101	%	60 - 140
			Carbon Tetrachloride	2021/09/24		101	%	70 - 130
			Chlorobenzene	2021/09/24		99	%	70 - 130
			Chloroform	2021/09/24		101	%	70 - 130
			Dibromochloromethane	2021/09/24		97	%	70 - 130
			1,2-Dichlorobenzene	2021/09/24		98	%	70 - 130
			1,3-Dichlorobenzene	2021/09/24		107	%	70 - 130
			1,4-Dichlorobenzene	2021/09/24		104	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2021/09/24		133	%	60 - 140
			1,1-Dichloroethane	2021/09/24		98	%	70 - 130
			1,2-Dichloroethane	2021/09/24		97	%	70 - 130
			1,1-Dichloroethylene	2021/09/24		102	%	70 - 130
			cis-1,2-Dichloroethylene	2021/09/24		98	%	70 - 130
			trans-1,2-Dichloroethylene	2021/09/24		98	%	70 - 130
			1,2-Dichloropropane	2021/09/24		100	%	70 - 130
			cis-1,3-Dichloropropene	2021/09/24		95	%	70 - 130
			trans-1,3-Dichloropropene	2021/09/24		106	%	70 - 130
			Ethylbenzene	2021/09/24		94	%	70 - 130
			Ethylene Dibromide	2021/09/24		94	%	70 - 130
			Hexane	2021/09/24		107	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/09/24		100	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24		103	%	60 - 140
			Methyl Isobutyl Ketone	2021/09/24		78	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/09/24		90	%	70 - 130
			Styrene	2021/09/24		85	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/09/24		100	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/09/24		98	%	70 - 130
			Tetrachloroethylene	2021/09/24		96	%	70 - 130
			Toluene	2021/09/24		100	%	70 - 130
			1,1,1-Trichloroethane	2021/09/24		103	%	70 - 130
			1,1,2-Trichloroethane	2021/09/24		109	%	70 - 130
			Trichloroethylene	2021/09/24		103	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/09/24		104	%	70 - 130
			Vinyl Chloride	2021/09/24		122	%	70 - 130
			p+m-Xylene	2021/09/24		96	%	70 - 130
			o-Xylene	2021/09/24		91	%	70 - 130
			F1 (C6-C10)	2021/09/24		98	%	60 - 140
			4-Bromofluorobenzene	2021/09/24		88	%	70 - 130
			D4-1,2-Dichloroethane	2021/09/24		108	%	70 - 130
			D8-Toluene	2021/09/24		99	%	70 - 130
			Acetone (2-Propanone)	2021/09/24	<10		ug/L	
			Benzene	2021/09/24	<0.17		ug/L	
			Bromodichloromethane	2021/09/24	<0.50		ug/L	
			Bromoform	2021/09/24	<1.0		ug/L	
			Bromomethane	2021/09/24	<0.50		ug/L	
			Carbon Tetrachloride	2021/09/24	<0.20		ug/L	
			Chlorobenzene	2021/09/24	<0.20		ug/L	
			Chloroform	2021/09/24	<0.20		ug/L	
			Dibromochloromethane	2021/09/24	<0.50		ug/L	
			1,2-Dichlorobenzene	2021/09/24	<0.50		ug/L	
			1,3-Dichlorobenzene	2021/09/24	<0.50		ug/L	



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7592471	BG1	RPD	1,4-Dichlorobenzene	2021/09/24	<0.50		ug/L	
			Dichlorodifluoromethane (FREON 12)	2021/09/24	<1.0		ug/L	
			1,1-Dichloroethane	2021/09/24	<0.20		ug/L	
			1,2-Dichloroethane	2021/09/24	<0.50		ug/L	
			1,1-Dichloroethylene	2021/09/24	<0.20		ug/L	
			cis-1,2-Dichloroethylene	2021/09/24	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2021/09/24	<0.50		ug/L	
			1,2-Dichloropropane	2021/09/24	<0.20		ug/L	
			cis-1,3-Dichloropropene	2021/09/24	<0.30		ug/L	
			trans-1,3-Dichloropropene	2021/09/24	<0.40		ug/L	
			Ethylbenzene	2021/09/24	<0.20		ug/L	
			Ethylene Dibromide	2021/09/24	<0.20		ug/L	
			Hexane	2021/09/24	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2021/09/24	<2.0		ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24	<10		ug/L	
			Methyl Isobutyl Ketone	2021/09/24	<5.0		ug/L	
			Methyl t-butyl ether (MTBE)	2021/09/24	<0.50		ug/L	
			Styrene	2021/09/24	<0.50		ug/L	
			1,1,1,2-Tetrachloroethane	2021/09/24	<0.50		ug/L	
			1,1,2,2-Tetrachloroethane	2021/09/24	<0.50		ug/L	
			Tetrachloroethylene	2021/09/24	<0.20		ug/L	
			Toluene	2021/09/24	<0.20		ug/L	
			1,1,1-Trichloroethane	2021/09/24	<0.20		ug/L	
			1,1,2-Trichloroethane	2021/09/24	<0.50		ug/L	
			Trichloroethylene	2021/09/24	<0.20		ug/L	
			Trichlorofluoromethane (FREON 11)	2021/09/24	<0.50		ug/L	
			Vinyl Chloride	2021/09/24	<0.20		ug/L	
			p+m-Xylene	2021/09/24	<0.20		ug/L	
			o-Xylene	2021/09/24	<0.20		ug/L	
			Total Xylenes	2021/09/24	<0.20		ug/L	
			F1 (C6-C10)	2021/09/24	<25		ug/L	
			F1 (C6-C10) - BTEX	2021/09/24	<25		ug/L	
			Acetone (2-Propanone)	2021/09/24	NC		%	30
			Benzene	2021/09/24	NC		%	30
			Bromodichloromethane	2021/09/24	NC		%	30
			Bromoform	2021/09/24	NC		%	30
			Bromomethane	2021/09/24	NC		%	30
			Carbon Tetrachloride	2021/09/24	NC		%	30
			Chlorobenzene	2021/09/24	NC		%	30
			Chloroform	2021/09/24	NC		%	30
			Dibromochloromethane	2021/09/24	NC		%	30
			1,2-Dichlorobenzene	2021/09/24	NC		%	30
			1,3-Dichlorobenzene	2021/09/24	NC		%	30
			1,4-Dichlorobenzene	2021/09/24	NC		%	30
			Dichlorodifluoromethane (FREON 12)	2021/09/24	NC		%	30
			1,1-Dichloroethane	2021/09/24	NC		%	30
			1,2-Dichloroethane	2021/09/24	NC		%	30
			1,1-Dichloroethylene	2021/09/24	NC		%	30
			cis-1,2-Dichloroethylene	2021/09/24	NC		%	30
			trans-1,2-Dichloroethylene	2021/09/24	NC		%	30
			1,2-Dichloropropane	2021/09/24	NC		%	30



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			cis-1,3-Dichloropropene	2021/09/24	NC		%	30
			trans-1,3-Dichloropropene	2021/09/24	NC		%	30
			Ethylbenzene	2021/09/24	NC		%	30
			Ethylene Dibromide	2021/09/24	NC		%	30
			Hexane	2021/09/24	NC		%	30
			Methylene Chloride(Dichloromethane)	2021/09/24	NC		%	30
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24	NC		%	30
			Methyl Isobutyl Ketone	2021/09/24	NC		%	30
			Methyl t-butyl ether (MTBE)	2021/09/24	NC		%	30
			Styrene	2021/09/24	NC		%	30
			1,1,1,2-Tetrachloroethane	2021/09/24	NC		%	30
			1,1,2,2-Tetrachloroethane	2021/09/24	NC		%	30
			Tetrachloroethylene	2021/09/24	NC		%	30
			Toluene	2021/09/24	NC		%	30
			1,1,1-Trichloroethane	2021/09/24	NC		%	30
			1,1,2-Trichloroethane	2021/09/24	NC		%	30
			Trichloroethylene	2021/09/24	NC		%	30
			Trichlorofluoromethane (FREON 11)	2021/09/24	NC		%	30
			Vinyl Chloride	2021/09/24	NC		%	30
			p+m-Xylene	2021/09/24	NC		%	30
			o-Xylene	2021/09/24	NC		%	30
			Total Xylenes	2021/09/24	NC		%	30
			F1 (C6-C10)	2021/09/24	NC		%	30
			F1 (C6-C10) - BTEX	2021/09/24	NC		%	30
7592614	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2021/09/22		98	%	85 - 115
7592614	SAU	Method Blank	Alkalinity (Total as CaCO3)	2021/09/22	<1.0		mg/L	
7592614	SAU	RPD [QRX484-01]	Alkalinity (Total as CaCO3)	2021/09/22	0.68		%	20
7592624	SAU	Spiked Blank	Conductivity	2021/09/22		100	%	85 - 115
7592624	SAU	Method Blank	Conductivity	2021/09/22	<1.0		umho/cm	
7592624	SAU	RPD [QRX484-01]	Conductivity	2021/09/22	0.41		%	25
7592626	SAU	Spiked Blank	pH	2021/09/22		102	%	98 - 103
7592626	SAU	RPD [QRX484-01]	pH	2021/09/22	0.66		%	N/A
7592627	ADB	Matrix Spike [QRX484-01]	Dissolved Chloride (Cl-)	2021/09/22		NC	%	80 - 120
7592627	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2021/09/22		100	%	80 - 120
7592627	ADB	Method Blank	Dissolved Chloride (Cl-)	2021/09/22	<1.0		mg/L	
7592627	ADB	RPD [QRX484-01]	Dissolved Chloride (Cl-)	2021/09/22	3.1		%	20
7592635	AKD	Matrix Spike [QRX484-01]	Dissolved Sulphate (SO4)	2021/09/22		NC	%	75 - 125
7592635	AKD	Spiked Blank	Dissolved Sulphate (SO4)	2021/09/22		99	%	80 - 120
7592635	AKD	Method Blank	Dissolved Sulphate (SO4)	2021/09/22	<1.0		mg/L	
7592635	AKD	RPD [QRX484-01]	Dissolved Sulphate (SO4)	2021/09/22	0.080		%	20
7592896	VRO	Matrix Spike	Total Ammonia-N	2021/09/23		100	%	75 - 125
7592896	VRO	Spiked Blank	Total Ammonia-N	2021/09/23		100	%	80 - 120
7592896	VRO	Method Blank	Total Ammonia-N	2021/09/23	<0.050		mg/L	
7592896	VRO	RPD	Total Ammonia-N	2021/09/23	NC		%	20
7593074	MEN	Matrix Spike	Dissolved Mercury (Hg)	2021/09/23		89	%	75 - 125
7593074	MEN	Spiked Blank	Dissolved Mercury (Hg)	2021/09/23		96	%	80 - 120
7593074	MEN	Method Blank	Dissolved Mercury (Hg)	2021/09/23	<0.10		ug/L	
7593074	MEN	RPD	Dissolved Mercury (Hg)	2021/09/23	NC		%	20
			Dissolved Mercury (Hg)	2021/09/23	NC		%	20
7593803	ADA	Matrix Spike	Dissolved (0.2u) Aluminum (Al)	2021/09/23		105	%	80 - 120
7593803	ADA	Spiked Blank	Dissolved (0.2u) Aluminum (Al)	2021/09/23		105	%	80 - 120



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7593803	ADA	Method Blank	Dissolved (0.2u) Aluminum (Al)	2021/09/23	<5		ug/L	
7593803	ADA	RPD	Dissolved (0.2u) Aluminum (Al)	2021/09/23	0.58		%	20
7595605	MEN	Matrix Spike	Dissolved Mercury (Hg)	2021/09/23		94	%	75 - 125
7595605	MEN	Spiked Blank	Dissolved Mercury (Hg)	2021/09/23		96	%	80 - 120
7595605	MEN	Method Blank	Dissolved Mercury (Hg)	2021/09/23	<0.10		ug/L	
7595605	MEN	RPD	Dissolved Mercury (Hg)	2021/09/23	NC		%	20
7596771	RAJ	Matrix Spike	D10-Anthracene	2021/09/24		84	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		92	%	50 - 130
			D8-Acenaphthylene	2021/09/24		72	%	50 - 130
			Acenaphthene	2021/09/24		71	%	50 - 130
			Acenaphthylene	2021/09/24		68	%	50 - 130
			Anthracene	2021/09/24		77	%	50 - 130
			Benzo(a)anthracene	2021/09/24		86	%	50 - 130
			Benzo(a)pyrene	2021/09/24		71	%	50 - 130
			Benzo(b/j)fluoranthene	2021/09/24		82	%	50 - 130
			Benzo(g,h,i)perylene	2021/09/24		61	%	50 - 130
			Benzo(k)fluoranthene	2021/09/24		83	%	50 - 130
			Chrysene	2021/09/24		87	%	50 - 130
			Dibenzo(a,h)anthracene	2021/09/24		59	%	50 - 130
			Fluoranthene	2021/09/24		92	%	50 - 130
			Fluorene	2021/09/24		74	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/09/24		66	%	50 - 130
			1-Methylnaphthalene	2021/09/24		70	%	50 - 130
			2-Methylnaphthalene	2021/09/24		66	%	50 - 130
			Naphthalene	2021/09/24		63	%	50 - 130
			Phenanthrene	2021/09/24		82	%	50 - 130
			Pyrene	2021/09/24		90	%	50 - 130
7596771	RAJ	Spiked Blank	D10-Anthracene	2021/09/24		101	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		105	%	50 - 130
			D8-Acenaphthylene	2021/09/24		98	%	50 - 130
			Acenaphthene	2021/09/24		91	%	50 - 130
			Acenaphthylene	2021/09/24		89	%	50 - 130
			Anthracene	2021/09/24		92	%	50 - 130
			Benzo(a)anthracene	2021/09/24		106	%	50 - 130
			Benzo(a)pyrene	2021/09/24		91	%	50 - 130
			Benzo(b/j)fluoranthene	2021/09/24		99	%	50 - 130
			Benzo(g,h,i)perylene	2021/09/24		87	%	50 - 130
			Benzo(k)fluoranthene	2021/09/24		110	%	50 - 130
			Chrysene	2021/09/24		105	%	50 - 130
			Dibenzo(a,h)anthracene	2021/09/24		70	%	50 - 130
			Fluoranthene	2021/09/24		103	%	50 - 130
			Fluorene	2021/09/24		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/09/24		95	%	50 - 130
			1-Methylnaphthalene	2021/09/24		90	%	50 - 130
			2-Methylnaphthalene	2021/09/24		86	%	50 - 130
			Naphthalene	2021/09/24		82	%	50 - 130
			Phenanthrene	2021/09/24		98	%	50 - 130
			Pyrene	2021/09/24		102	%	50 - 130
7596771	RAJ	RPD	Acenaphthene	2021/09/24	1.4		%	30
			Acenaphthylene	2021/09/24	1.6		%	30
			Anthracene	2021/09/24	2.0		%	30



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7596771	RAJ	Method Blank	Benzo(a)anthracene	2021/09/24	1.6		%	30
			Benzo(a)pyrene	2021/09/24	1.6		%	30
			Benzo(b/j)fluoranthene	2021/09/24	0.93		%	30
			Benzo(g,h,i)perylene	2021/09/24	3.6		%	30
			Benzo(k)fluoranthene	2021/09/24	1.8		%	30
			Chrysene	2021/09/24	0.11		%	30
			Dibenzo(a,h)anthracene	2021/09/24	7.5		%	30
			Fluoranthene	2021/09/24	6.7		%	30
			Fluorene	2021/09/24	1.8		%	30
			Indeno(1,2,3-cd)pyrene	2021/09/24	3.7		%	30
			1-Methylnaphthalene	2021/09/24	0.14		%	30
			2-Methylnaphthalene	2021/09/24	0.89		%	30
			Naphthalene	2021/09/24	1.3		%	30
			Phenanthrene	2021/09/24	1.6		%	30
			Pyrene	2021/09/24	5.8		%	30
			D10-Anthracene	2021/09/24		103	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		111	%	50 - 130
			D8-Acenaphthylene	2021/09/24		94	%	50 - 130
			Acenaphthene	2021/09/24	<0.010		ug/L	
			Acenaphthylene	2021/09/24	<0.010		ug/L	
			Anthracene	2021/09/24	<0.010		ug/L	
			Benzo(a)anthracene	2021/09/24	<0.010		ug/L	
			Benzo(a)pyrene	2021/09/24	<0.0090		ug/L	
			Benzo(b/j)fluoranthene	2021/09/24	<0.010		ug/L	
			Benzo(g,h,i)perylene	2021/09/24	<0.010		ug/L	
			Benzo(k)fluoranthene	2021/09/24	<0.010		ug/L	
			Chrysene	2021/09/24	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2021/09/24	<0.010		ug/L	
			Fluoranthene	2021/09/24	<0.010		ug/L	
			Fluorene	2021/09/24	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2021/09/24	<0.010		ug/L	
			1-Methylnaphthalene	2021/09/24	<0.010		ug/L	
			2-Methylnaphthalene	2021/09/24	<0.010		ug/L	
			Naphthalene	2021/09/24	<0.010		ug/L	
			Phenanthrene	2021/09/24	<0.010		ug/L	
			Pyrene	2021/09/24	<0.010		ug/L	
7597851	KTR	Matrix Spike	o-Terphenyl	2021/09/24		96	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24		98	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/09/24		94	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/09/24		95	%	60 - 130
7597851	KTR	Spiked Blank	o-Terphenyl	2021/09/24		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24		97	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/09/24		96	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/09/24		95	%	60 - 130
7597851	KTR	Method Blank	o-Terphenyl	2021/09/24		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2021/09/24	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2021/09/24	<200		ug/L	
7597851	KTR	RPD	F2 (C10-C16 Hydrocarbons)	2021/09/24	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2021/09/24	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2021/09/24	NC		%	30



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7598188	DT1	Matrix Spike	Total Aluminum (Al)	2021/09/24		107	%	80 - 120
			Total Antimony (Sb)	2021/09/24		118	%	80 - 120
			Total Arsenic (As)	2021/09/24		104	%	80 - 120
			Total Barium (Ba)	2021/09/24		102	%	80 - 120
			Total Beryllium (Be)	2021/09/24		104	%	80 - 120
			Total Bismuth (Bi)	2021/09/24		92	%	80 - 120
			Total Boron (B)	2021/09/24		101	%	80 - 120
			Total Cadmium (Cd)	2021/09/24		105	%	80 - 120
			Total Calcium (Ca)	2021/09/24		NC	%	80 - 120
			Total Chromium (Cr)	2021/09/24		97	%	80 - 120
			Total Cobalt (Co)	2021/09/24		101	%	80 - 120
			Total Copper (Cu)	2021/09/24		107	%	80 - 120
			Total Iron (Fe)	2021/09/24		97	%	80 - 120
			Total Lead (Pb)	2021/09/24		97	%	80 - 120
			Total Lithium (Li)	2021/09/24		108	%	80 - 120
			Total Magnesium (Mg)	2021/09/24		97	%	80 - 120
			Total Manganese (Mn)	2021/09/24		99	%	80 - 120
			Total Molybdenum (Mo)	2021/09/24		109	%	80 - 120
			Total Nickel (Ni)	2021/09/24		96	%	80 - 120
			Total Potassium (K)	2021/09/24		100	%	80 - 120
			Total Selenium (Se)	2021/09/24		104	%	80 - 120
			Total Silicon (Si)	2021/09/24		98	%	80 - 120
			Total Silver (Ag)	2021/09/24		102	%	80 - 120
			Total Sodium (Na)	2021/09/24		NC	%	80 - 120
			Total Strontium (Sr)	2021/09/24		103	%	80 - 120
			Total Tellurium (Te)	2021/09/24		103	%	80 - 120
			Total Thallium (Tl)	2021/09/24		86	%	80 - 120
			Total Tin (Sn)	2021/09/24		106	%	80 - 120
			Total Titanium (Ti)	2021/09/24		100	%	80 - 120
			Total Tungsten (W)	2021/09/24		104	%	80 - 120
			Total Uranium (U)	2021/09/24		96	%	80 - 120
			Total Vanadium (V)	2021/09/24		101	%	80 - 120
			Total Zinc (Zn)	2021/09/24		101	%	80 - 120
			Total Zirconium (Zr)	2021/09/24		111	%	80 - 120
7598188	DT1	Spiked Blank	Total Aluminum (Al)	2021/09/24		97	%	80 - 120
			Total Antimony (Sb)	2021/09/24		113	%	80 - 120
			Total Arsenic (As)	2021/09/24		104	%	80 - 120
			Total Barium (Ba)	2021/09/24		101	%	80 - 120
			Total Beryllium (Be)	2021/09/24		102	%	80 - 120
			Total Bismuth (Bi)	2021/09/24		94	%	80 - 120
			Total Boron (B)	2021/09/24		97	%	80 - 120
			Total Cadmium (Cd)	2021/09/24		102	%	80 - 120
			Total Calcium (Ca)	2021/09/24		100	%	80 - 120
			Total Chromium (Cr)	2021/09/24		100	%	80 - 120
			Total Cobalt (Co)	2021/09/24		102	%	80 - 120
			Total Copper (Cu)	2021/09/24		104	%	80 - 120
			Total Iron (Fe)	2021/09/24		100	%	80 - 120
			Total Lead (Pb)	2021/09/24		98	%	80 - 120
			Total Lithium (Li)	2021/09/24		107	%	80 - 120
			Total Magnesium (Mg)	2021/09/24		100	%	80 - 120
			Total Manganese (Mn)	2021/09/24		101	%	80 - 120



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7598188	DT1	Method Blank	Total Molybdenum (Mo)	2021/09/24		106	%	80 - 120
			Total Nickel (Ni)	2021/09/24		99	%	80 - 120
			Total Potassium (K)	2021/09/24		102	%	80 - 120
			Total Selenium (Se)	2021/09/24		102	%	80 - 120
			Total Silicon (Si)	2021/09/24		99	%	80 - 120
			Total Silver (Ag)	2021/09/24		104	%	80 - 120
			Total Sodium (Na)	2021/09/24		97	%	80 - 120
			Total Strontium (Sr)	2021/09/24		100	%	80 - 120
			Total Tellurium (Te)	2021/09/24		101	%	80 - 120
			Total Thallium (Tl)	2021/09/24		97	%	80 - 120
			Total Tin (Sn)	2021/09/24		101	%	80 - 120
			Total Titanium (Ti)	2021/09/24		96	%	80 - 120
			Total Tungsten (W)	2021/09/24		102	%	80 - 120
			Total Uranium (U)	2021/09/24		96	%	80 - 120
			Total Vanadium (V)	2021/09/24		100	%	80 - 120
			Total Zinc (Zn)	2021/09/24		105	%	80 - 120
			Total Zirconium (Zr)	2021/09/24		105	%	80 - 120
			Total Aluminum (Al)	2021/09/24	<4.9		ug/L	
			Total Antimony (Sb)	2021/09/24	<0.50		ug/L	
			Total Arsenic (As)	2021/09/24	<1.0		ug/L	
			Total Barium (Ba)	2021/09/24	<2.0		ug/L	
			Total Beryllium (Be)	2021/09/24	<0.40		ug/L	
			Total Bismuth (Bi)	2021/09/24	<1.0		ug/L	
			Total Boron (B)	2021/09/24	<10		ug/L	
			Total Cadmium (Cd)	2021/09/24	<0.090		ug/L	
			Total Calcium (Ca)	2021/09/24	<200		ug/L	
			Total Chromium (Cr)	2021/09/24	<5.0		ug/L	
			Total Cobalt (Co)	2021/09/24	<0.50		ug/L	
			Total Copper (Cu)	2021/09/24	<0.90		ug/L	
			Total Iron (Fe)	2021/09/24	<100		ug/L	
			Total Lead (Pb)	2021/09/24	<0.50		ug/L	
			Total Lithium (Li)	2021/09/24	<5.0		ug/L	
			Total Magnesium (Mg)	2021/09/24	<50		ug/L	
			Total Manganese (Mn)	2021/09/24	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/09/24	<0.50		ug/L	
			Total Nickel (Ni)	2021/09/24	<1.0		ug/L	
			Total Potassium (K)	2021/09/24	<200		ug/L	
			Total Selenium (Se)	2021/09/24	<2.0		ug/L	
			Total Silicon (Si)	2021/09/24	<50		ug/L	
			Total Silver (Ag)	2021/09/24	<0.090		ug/L	
			Total Sodium (Na)	2021/09/24	<100		ug/L	
			Total Strontium (Sr)	2021/09/24	<1.0		ug/L	
			Total Tellurium (Te)	2021/09/24	<1.0		ug/L	
			Total Thallium (Tl)	2021/09/24	<0.050		ug/L	
			Total Tin (Sn)	2021/09/24	<1.0		ug/L	
			Total Titanium (Ti)	2021/09/24	<5.0		ug/L	
			Total Tungsten (W)	2021/09/24	<1.0		ug/L	
			Total Uranium (U)	2021/09/24	<0.10		ug/L	
			Total Vanadium (V)	2021/09/24	<0.50		ug/L	
			Total Zinc (Zn)	2021/09/24	<5.0		ug/L	



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zirconium (Zr)	2021/09/24	<1.0		ug/L	
N/A = Not Applicable								
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.								
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.								
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.								
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)								
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).								



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VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

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



Your Project #: 11-1170-0043
 Site Location: HWS BARRIE
 Your C.O.C. #: 830380-09-01

Attention: Dawn Hoyle

Golder Associates Ltd
 121 Commerce Park Drive
 Unit L
 Barrie, ON
 CANADA L4N 8X1

Report Date: 2021/09/29
 Report #: R6832474
 Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1R1207

Received: 2021/09/20, 15:52

Sample Matrix: Water
 # Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Methylnaphthalene Sum	1	N/A	2021/09/24	CAM SOP-00301	EPA 8270D m
Dissolved Aluminum (0.2 u, clay free)	1	N/A	2021/09/23	CAM SOP-00447	EPA 6020B m
Alkalinity	1	N/A	2021/09/22	CAM SOP-00448	SM 23 2320 B m
1,3-Dichloropropene Sum	2	N/A	2021/09/27		EPA 8260C m
Chloride by Automated Colourimetry	1	N/A	2021/09/22	CAM SOP-00463	SM 23 4500-Cl E m
Conductivity	1	N/A	2021/09/22	CAM SOP-00414	SM 23 2510 m
Petroleum Hydrocarbons F2-F4 in Water (1)	1	2021/09/24	2021/09/24	CAM SOP-00316	CCME PHC-CWS m
Hardness (calculated as CaCO3)	1	N/A	2021/09/23	CAM SOP 00102/00408/00447	SM 2340 B
Dissolved Mercury in Water by CVAA	1	2021/09/23	2021/09/23	CAM SOP-00453	EPA 7470A m
Total Metals Analysis by ICPMS	1	N/A	2021/09/24	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	1	N/A	2021/09/23	CAM SOP-00441	USGS I-2522-90 m
PAH Compounds in Water by GC/MS (SIM)	1	2021/09/23	2021/09/24	CAM SOP-00318	EPA 8270 m
pH	1	2021/09/22	2021/09/22	CAM SOP-00413	SM 4500H+ B m
Sulphate by Automated Colourimetry	1	N/A	2021/09/22	CAM SOP-00464	EPA 375.4 m
Volatile Organic Compounds and F1 PHCs	2	N/A	2021/09/25	CAM SOP-00230	EPA 8260C m

Remarks:

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

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

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



Your Project #: 11-1170-0043
Site Location: HWS BARRIE
Your C.O.C. #: 830380-09-01

Attention: Dawn Hoyle

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2021/09/29
Report #: R6832474
Version: 3 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1R1207

Received: 2021/09/20, 15:52

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

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

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Ema Gitej, Senior Project Manager

Email: emese.gitej@bureauveritas.com

Phone# (905)817-5829

=====

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



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

RESULTS OF ANALYSES OF WATER

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Calculated Parameters				
Hardness (CaCO ₃)	mg/L	<1.0	1.0	7589912
Inorganics				
Total Ammonia-N	mg/L	<0.050	0.050	7592896
Conductivity	umho/cm	<1.0	1.0	7592624
pH	pH	5.80		7592626
Dissolved Sulphate (SO ₄)	mg/L	<1.0	1.0	7592635
Alkalinity (Total as CaCO ₃)	mg/L	<1.0	1.0	7592614
Dissolved Chloride (Cl ⁻)	mg/L	<1.0	1.0	7592627
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Metals				
Dissolved (0.2u) Aluminum (Al)	ug/L	<5	5	7593803
Dissolved Mercury (Hg)	ug/L	<0.10	0.10	7595605
Total Aluminum (Al)	ug/L	34	4.9	7598188
Total Antimony (Sb)	ug/L	<0.50	0.50	7598188
Total Arsenic (As)	ug/L	<1.0	1.0	7598188
Total Barium (Ba)	ug/L	<2.0	2.0	7598188
Total Beryllium (Be)	ug/L	<0.40	0.40	7598188
Total Bismuth (Bi)	ug/L	<1.0	1.0	7598188
Total Boron (B)	ug/L	<10	10	7598188
Total Cadmium (Cd)	ug/L	<0.090	0.090	7598188
Total Calcium (Ca)	ug/L	<200	200	7598188
Total Chromium (Cr)	ug/L	<5.0	5.0	7598188
Total Cobalt (Co)	ug/L	<0.50	0.50	7598188
Total Copper (Cu)	ug/L	<0.90	0.90	7598188
Total Iron (Fe)	ug/L	<100	100	7598188
Total Lead (Pb)	ug/L	<0.50	0.50	7598188
Total Lithium (Li)	ug/L	<5.0	5.0	7598188
Total Magnesium (Mg)	ug/L	<50	50	7598188
Total Manganese (Mn)	ug/L	<2.0	2.0	7598188
Total Molybdenum (Mo)	ug/L	<0.50	0.50	7598188
Total Nickel (Ni)	ug/L	<1.0	1.0	7598188
Total Potassium (K)	ug/L	<200	200	7598188
Total Selenium (Se)	ug/L	<2.0	2.0	7598188
Total Silicon (Si)	ug/L	<50	50	7598188
Total Silver (Ag)	ug/L	<0.090	0.090	7598188
Total Sodium (Na)	ug/L	<100	100	7598188
Total Strontium (Sr)	ug/L	<1.0	1.0	7598188
Total Tellurium (Te)	ug/L	<1.0	1.0	7598188
Total Thallium (Tl)	ug/L	<0.050	0.050	7598188
Total Tin (Sn)	ug/L	<1.0	1.0	7598188
Total Titanium (Ti)	ug/L	<5.0	5.0	7598188
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Total Tungsten (W)	ug/L	<1.0	1.0	7598188
Total Uranium (U)	ug/L	<0.10	0.10	7598188
Total Vanadium (V)	ug/L	<0.50	0.50	7598188
Total Zinc (Zn)	ug/L	<5.0	5.0	7598188
Total Zirconium (Zr)	ug/L	<1.0	1.0	7598188
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Calculated Parameters				
Methylnaphthalene, 2-(1-)	ug/L	<0.014	0.014	7591192
Polyaromatic Hydrocarbons				
Acenaphthene	ug/L	<0.010	0.010	7596771
Acenaphthylene	ug/L	<0.010	0.010	7596771
Anthracene	ug/L	<0.010	0.010	7596771
Benzo(a)anthracene	ug/L	<0.010	0.010	7596771
Benzo(a)pyrene	ug/L	<0.0090	0.0090	7596771
Benzo(b,j)fluoranthene	ug/L	<0.010	0.010	7596771
Benzo(g,h,i)perylene	ug/L	<0.010	0.010	7596771
Benzo(k)fluoranthene	ug/L	<0.010	0.010	7596771
Chrysene	ug/L	<0.010	0.010	7596771
Dibenzo(a,h)anthracene	ug/L	<0.010	0.010	7596771
Fluoranthene	ug/L	<0.010	0.010	7596771
Fluorene	ug/L	<0.010	0.010	7596771
Indeno(1,2,3-cd)pyrene	ug/L	<0.010	0.010	7596771
1-Methylnaphthalene	ug/L	<0.010	0.010	7596771
2-Methylnaphthalene	ug/L	<0.010	0.010	7596771
Naphthalene	ug/L	<0.010	0.010	7596771
Phenanthrene	ug/L	<0.010	0.010	7596771
Pyrene	ug/L	<0.010	0.010	7596771
Surrogate Recovery (%)				
D10-Anthracene	%	106		7596771
D14-Terphenyl (FS)	%	104		7596771
D8-Acenaphthylene	%	94		7596771
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		QRX486		
Sampling Date		2021/09/17 11:00		
COC Number		830380-09-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	759999
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7592471
Benzene	ug/L	<0.17	0.17	7592471
Bromodichloromethane	ug/L	<0.50	0.50	7592471
Bromoform	ug/L	<1.0	1.0	7592471
Bromomethane	ug/L	<0.50	0.50	7592471
Carbon Tetrachloride	ug/L	<0.20	0.20	7592471
Chlorobenzene	ug/L	<0.20	0.20	7592471
Chloroform	ug/L	<0.20	0.20	7592471
Dibromochloromethane	ug/L	<0.50	0.50	7592471
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7592471
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7592471
1,1-Dichloroethane	ug/L	<0.20	0.20	7592471
1,2-Dichloroethane	ug/L	<0.50	0.50	7592471
1,1-Dichloroethylene	ug/L	<0.20	0.20	7592471
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
1,2-Dichloropropane	ug/L	<0.20	0.20	7592471
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7592471
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7592471
Ethylbenzene	ug/L	<0.20	0.20	7592471
Ethylene Dibromide	ug/L	<0.20	0.20	7592471
Hexane	ug/L	<1.0	1.0	7592471
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7592471
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7592471
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7592471
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7592471
Styrene	ug/L	<0.50	0.50	7592471
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID		QRX486		
Sampling Date		2021/09/17 11:00		
COC Number		830380-09-01		
	UNITS	TRIP BLANK	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
Tetrachloroethylene	ug/L	<0.20	0.20	7592471
Toluene	ug/L	<0.20	0.20	7592471
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7592471
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7592471
Trichloroethylene	ug/L	<0.20	0.20	7592471
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7592471
Vinyl Chloride	ug/L	<0.20	0.20	7592471
p+m-Xylene	ug/L	<0.20	0.20	7592471
o-Xylene	ug/L	<0.20	0.20	7592471
Total Xylenes	ug/L	<0.20	0.20	7592471
F1 (C6-C10)	ug/L	<25	25	7592471
F1 (C6-C10) - BTEX	ug/L	<25	25	7592471
Surrogate Recovery (%)				
4-Bromofluorobenzene	%	83		7592471
D4-1,2-Dichloroethane	%	110		7592471
D8-Toluene	%	104		7592471
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

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

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
Calculated Parameters				
1,3-Dichloropropene (cis+trans)	ug/L	<0.50	0.50	759999
Volatile Organics				
Acetone (2-Propanone)	ug/L	<10	10	7592471
Benzene	ug/L	<0.17	0.17	7592471
Bromodichloromethane	ug/L	<0.50	0.50	7592471
Bromoform	ug/L	<1.0	1.0	7592471
Bromomethane	ug/L	<0.50	0.50	7592471
Carbon Tetrachloride	ug/L	<0.20	0.20	7592471
Chlorobenzene	ug/L	<0.20	0.20	7592471
Chloroform	ug/L	4.1	0.20	7592471
Dibromochloromethane	ug/L	<0.50	0.50	7592471
1,2-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,3-Dichlorobenzene	ug/L	<0.50	0.50	7592471
1,4-Dichlorobenzene	ug/L	<0.50	0.50	7592471
Dichlorodifluoromethane (FREON 12)	ug/L	<1.0	1.0	7592471
1,1-Dichloroethane	ug/L	<0.20	0.20	7592471
1,2-Dichloroethane	ug/L	<0.50	0.50	7592471
1,1-Dichloroethylene	ug/L	<0.20	0.20	7592471
cis-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
trans-1,2-Dichloroethylene	ug/L	<0.50	0.50	7592471
1,2-Dichloropropane	ug/L	<0.20	0.20	7592471
cis-1,3-Dichloropropene	ug/L	<0.30	0.30	7592471
trans-1,3-Dichloropropene	ug/L	<0.40	0.40	7592471
Ethylbenzene	ug/L	<0.20	0.20	7592471
Ethylene Dibromide	ug/L	<0.20	0.20	7592471
Hexane	ug/L	<1.0	1.0	7592471
Methylene Chloride(Dichloromethane)	ug/L	<2.0	2.0	7592471
Methyl Ethyl Ketone (2-Butanone)	ug/L	<10	10	7592471
Methyl Isobutyl Ketone	ug/L	<5.0	5.0	7592471
Methyl t-butyl ether (MTBE)	ug/L	<0.50	0.50	7592471
Styrene	ug/L	<0.50	0.50	7592471
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				



BUREAU
VERITAS

BV Labs Job #: C1R1207

Report Date: 2021/09/29

Golder Associates Ltd

Client Project #: 11-1170-0043

Site Location: HWS BARRIE

Sampler Initials: DP

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

BV Labs ID		QRX485		
Sampling Date		2021/09/17 05:30		
COC Number		830380-09-01		
	UNITS	FIELD BLANK	RDL	QC Batch
1,1,1,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
1,1,2,2-Tetrachloroethane	ug/L	<0.50	0.50	7592471
Tetrachloroethylene	ug/L	<0.20	0.20	7592471
Toluene	ug/L	<0.20	0.20	7592471
1,1,1-Trichloroethane	ug/L	<0.20	0.20	7592471
1,1,2-Trichloroethane	ug/L	<0.50	0.50	7592471
Trichloroethylene	ug/L	<0.20	0.20	7592471
Trichlorofluoromethane (FREON 11)	ug/L	<0.50	0.50	7592471
Vinyl Chloride	ug/L	<0.20	0.20	7592471
p+m-Xylene	ug/L	<0.20	0.20	7592471
o-Xylene	ug/L	<0.20	0.20	7592471
Total Xylenes	ug/L	<0.20	0.20	7592471
F1 (C6-C10)	ug/L	<25	25	7592471
F1 (C6-C10) - BTEX	ug/L	<25	25	7592471
F2-F4 Hydrocarbons				
F2 (C10-C16 Hydrocarbons)	ug/L	<100	100	7597851
F3 (C16-C34 Hydrocarbons)	ug/L	<200	200	7597851
F4 (C34-C50 Hydrocarbons)	ug/L	<200	200	7597851
Reached Baseline at C50	ug/L	Yes		7597851
Surrogate Recovery (%)				
o-Terphenyl	%	88		7597851
4-Bromofluorobenzene	%	83		7592471
D4-1,2-Dichloroethane	%	121		7592471
D8-Toluene	%	98		7592471
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

TEST SUMMARY

BV Labs ID: QRX485
Sample ID: FIELD BLANK
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Methylnaphthalene Sum	CALC	7591192	N/A	2021/09/24	Automated Statchk
Dissolved Aluminum (0.2 u, clay free)	ICP/MS	7593803	N/A	2021/09/23	Arefa Dabhad
Alkalinity	AT	7592614	N/A	2021/09/22	Surinder Rai
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Chloride by Automated Colourimetry	KONE	7592627	N/A	2021/09/22	Alina Dobreanu
Conductivity	AT	7592624	N/A	2021/09/22	Surinder Rai
Petroleum Hydrocarbons F2-F4 in Water	GC/FID	7597851	2021/09/24	2021/09/24	Ksenia Trofimova
Hardness (calculated as CaCO ₃)		7589912	N/A	2021/09/23	Automated Statchk
Dissolved Mercury in Water by CVAA	CV/AA	7595605	2021/09/23	2021/09/23	Medhat Nasr
Total Metals Analysis by ICPMS	ICP/MS	7598188	N/A	2021/09/24	Daniel Teclu
Total Ammonia-N	LACH/NH ₄	7592896	N/A	2021/09/23	Viorica Rotaru
PAH Compounds in Water by GC/MS (SIM)	GC/MS	7596771	2021/09/23	2021/09/24	Mitesh Raj
pH	AT	7592626	2021/09/22	2021/09/22	Surinder Rai
Sulphate by Automated Colourimetry	KONE	7592635	N/A	2021/09/22	Avneet Kour Sudan
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/25	Blair Gannon

BV Labs ID: QRX486
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2021/09/17
Shipped:
Received: 2021/09/20

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
1,3-Dichloropropene Sum	CALC	7589999	N/A	2021/09/27	Automated Statchk
Volatile Organic Compounds and F1 PHCs	GC/MSFD	7592471	N/A	2021/09/25	Blair Gannon



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

GENERAL COMMENTS

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

Package 1	5.0°C
Package 2	8.0°C
Package 3	8.0°C

Revised report (2021/09/29): Split report as per client request.

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7592471	BG1	Matrix Spike		4-Bromofluorobenzene	2021/09/24		100	%	70 - 130
				D4-1,2-Dichloroethane	2021/09/24		103	%	70 - 130
				D8-Toluene	2021/09/24		105	%	70 - 130
				Acetone (2-Propanone)	2021/09/24		98	%	60 - 140
				Benzene	2021/09/24		86	%	70 - 130
				Bromodichloromethane	2021/09/24		100	%	70 - 130
				Bromoform	2021/09/24		95	%	70 - 130
				Bromomethane	2021/09/24		92	%	60 - 140
				Carbon Tetrachloride	2021/09/24		97	%	70 - 130
				Chlorobenzene	2021/09/24		99	%	70 - 130
				Chloroform	2021/09/24		97	%	70 - 130
				Dibromochloromethane	2021/09/24		98	%	70 - 130
				1,2-Dichlorobenzene	2021/09/24		98	%	70 - 130
				1,3-Dichlorobenzene	2021/09/24		106	%	70 - 130
				1,4-Dichlorobenzene	2021/09/24		101	%	70 - 130
				Dichlorodifluoromethane (FREON 12)	2021/09/24		125	%	60 - 140
				1,1-Dichloroethane	2021/09/24		93	%	70 - 130
				1,2-Dichloroethane	2021/09/24		97	%	70 - 130
				1,1-Dichloroethylene	2021/09/24		99	%	70 - 130
				cis-1,2-Dichloroethylene	2021/09/24		94	%	70 - 130
				trans-1,2-Dichloroethylene	2021/09/24		93	%	70 - 130
				1,2-Dichloropropane	2021/09/24		97	%	70 - 130
				cis-1,3-Dichloropropene	2021/09/24		94	%	70 - 130
				trans-1,3-Dichloropropene	2021/09/24		106	%	70 - 130
				Ethylbenzene	2021/09/24		94	%	70 - 130
				Ethylene Dibromide	2021/09/24		96	%	70 - 130
				Hexane	2021/09/24		101	%	70 - 130
				Methylene Chloride(Dichloromethane)	2021/09/24		98	%	70 - 130
				Methyl Ethyl Ketone (2-Butanone)	2021/09/24		103	%	60 - 140
				Methyl Isobutyl Ketone	2021/09/24		77	%	70 - 130
				Methyl t-butyl ether (MTBE)	2021/09/24		91	%	70 - 130
				Styrene	2021/09/24		81	%	70 - 130
				1,1,1,2-Tetrachloroethane	2021/09/24		99	%	70 - 130
				1,1,2,2-Tetrachloroethane	2021/09/24		98	%	70 - 130
				Tetrachloroethylene	2021/09/24		93	%	70 - 130
				Toluene	2021/09/24		99	%	70 - 130
				1,1,1-Trichloroethane	2021/09/24		99	%	70 - 130
				1,1,2-Trichloroethane	2021/09/24		109	%	70 - 130
				Trichloroethylene	2021/09/24		99	%	70 - 130
				Trichlorofluoromethane (FREON 11)	2021/09/24		98	%	70 - 130
				Vinyl Chloride	2021/09/24		118	%	70 - 130
				p+m-Xylene	2021/09/24		94	%	70 - 130
				o-Xylene	2021/09/24		91	%	70 - 130
				F1 (C6-C10)	2021/09/24		94	%	60 - 140
7592471	BG1	Spiked Blank		4-Bromofluorobenzene	2021/09/24		99	%	70 - 130
				D4-1,2-Dichloroethane	2021/09/24		104	%	70 - 130
				D8-Toluene	2021/09/24		106	%	70 - 130
				Acetone (2-Propanone)	2021/09/24		96	%	60 - 140
				Benzene	2021/09/24		89	%	70 - 130
				Bromodichloromethane	2021/09/24		103	%	70 - 130
				Bromoform	2021/09/24		95	%	70 - 130



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Bromomethane	2021/09/24		101	%	60 - 140
			Carbon Tetrachloride	2021/09/24		101	%	70 - 130
			Chlorobenzene	2021/09/24		99	%	70 - 130
			Chloroform	2021/09/24		101	%	70 - 130
			Dibromochloromethane	2021/09/24		97	%	70 - 130
			1,2-Dichlorobenzene	2021/09/24		98	%	70 - 130
			1,3-Dichlorobenzene	2021/09/24		107	%	70 - 130
			1,4-Dichlorobenzene	2021/09/24		104	%	70 - 130
			Dichlorodifluoromethane (FREON 12)	2021/09/24		133	%	60 - 140
			1,1-Dichloroethane	2021/09/24		98	%	70 - 130
			1,2-Dichloroethane	2021/09/24		97	%	70 - 130
			1,1-Dichloroethylene	2021/09/24		102	%	70 - 130
			cis-1,2-Dichloroethylene	2021/09/24		98	%	70 - 130
			trans-1,2-Dichloroethylene	2021/09/24		98	%	70 - 130
			1,2-Dichloropropane	2021/09/24		100	%	70 - 130
			cis-1,3-Dichloropropene	2021/09/24		95	%	70 - 130
			trans-1,3-Dichloropropene	2021/09/24		106	%	70 - 130
			Ethylbenzene	2021/09/24		94	%	70 - 130
			Ethylene Dibromide	2021/09/24		94	%	70 - 130
			Hexane	2021/09/24		107	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/09/24		100	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24		103	%	60 - 140
			Methyl Isobutyl Ketone	2021/09/24		78	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/09/24		90	%	70 - 130
			Styrene	2021/09/24		85	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/09/24		100	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/09/24		98	%	70 - 130
			Tetrachloroethylene	2021/09/24		96	%	70 - 130
			Toluene	2021/09/24		100	%	70 - 130
			1,1,1-Trichloroethane	2021/09/24		103	%	70 - 130
			1,1,2-Trichloroethane	2021/09/24		109	%	70 - 130
			Trichloroethylene	2021/09/24		103	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/09/24		104	%	70 - 130
			Vinyl Chloride	2021/09/24		122	%	70 - 130
			p+m-Xylene	2021/09/24		96	%	70 - 130
			o-Xylene	2021/09/24		91	%	70 - 130
			F1 (C6-C10)	2021/09/24		98	%	60 - 140
7592471	BG1	Method Blank	4-Bromofluorobenzene	2021/09/24		88	%	70 - 130
			D4-1,2-Dichloroethane	2021/09/24		108	%	70 - 130
			D8-Toluene	2021/09/24		99	%	70 - 130
			Acetone (2-Propanone)	2021/09/24	<10		ug/L	
			Benzene	2021/09/24	<0.17		ug/L	
			Bromodichloromethane	2021/09/24	<0.50		ug/L	
			Bromoform	2021/09/24	<1.0		ug/L	
			Bromomethane	2021/09/24	<0.50		ug/L	
			Carbon Tetrachloride	2021/09/24	<0.20		ug/L	
			Chlorobenzene	2021/09/24	<0.20		ug/L	
			Chloroform	2021/09/24	<0.20		ug/L	
			Dibromochloromethane	2021/09/24	<0.50		ug/L	
			1,2-Dichlorobenzene	2021/09/24	<0.50		ug/L	
			1,3-Dichlorobenzene	2021/09/24	<0.50		ug/L	



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7592471	BG1	RPD	1,4-Dichlorobenzene	2021/09/24	<0.50		ug/L	
			Dichlorodifluoromethane (FREON 12)	2021/09/24	<1.0		ug/L	
			1,1-Dichloroethane	2021/09/24	<0.20		ug/L	
			1,2-Dichloroethane	2021/09/24	<0.50		ug/L	
			1,1-Dichloroethylene	2021/09/24	<0.20		ug/L	
			cis-1,2-Dichloroethylene	2021/09/24	<0.50		ug/L	
			trans-1,2-Dichloroethylene	2021/09/24	<0.50		ug/L	
			1,2-Dichloropropane	2021/09/24	<0.20		ug/L	
			cis-1,3-Dichloropropene	2021/09/24	<0.30		ug/L	
			trans-1,3-Dichloropropene	2021/09/24	<0.40		ug/L	
			Ethylbenzene	2021/09/24	<0.20		ug/L	
			Ethylene Dibromide	2021/09/24	<0.20		ug/L	
			Hexane	2021/09/24	<1.0		ug/L	
			Methylene Chloride(Dichloromethane)	2021/09/24	<2.0		ug/L	
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24	<10		ug/L	
			Methyl Isobutyl Ketone	2021/09/24	<5.0		ug/L	
			Methyl t-butyl ether (MTBE)	2021/09/24	<0.50		ug/L	
			Styrene	2021/09/24	<0.50		ug/L	
			1,1,1,2-Tetrachloroethane	2021/09/24	<0.50		ug/L	
			1,1,2,2-Tetrachloroethane	2021/09/24	<0.50		ug/L	
			Tetrachloroethylene	2021/09/24	<0.20		ug/L	
			Toluene	2021/09/24	<0.20		ug/L	
			1,1,1-Trichloroethane	2021/09/24	<0.20		ug/L	
			1,1,2-Trichloroethane	2021/09/24	<0.50		ug/L	
			Trichloroethylene	2021/09/24	<0.20		ug/L	
			Trichlorofluoromethane (FREON 11)	2021/09/24	<0.50		ug/L	
			Vinyl Chloride	2021/09/24	<0.20		ug/L	
			p+m-Xylene	2021/09/24	<0.20		ug/L	
			o-Xylene	2021/09/24	<0.20		ug/L	
			Total Xylenes	2021/09/24	<0.20		ug/L	
			F1 (C6-C10)	2021/09/24	<25		ug/L	
			F1 (C6-C10) - BTEX	2021/09/24	<25		ug/L	
			Acetone (2-Propanone)	2021/09/24	NC		%	30
			Benzene	2021/09/24	NC		%	30
			Bromodichloromethane	2021/09/24	NC		%	30
			Bromoform	2021/09/24	NC		%	30
			Bromomethane	2021/09/24	NC		%	30
			Carbon Tetrachloride	2021/09/24	NC		%	30
			Chlorobenzene	2021/09/24	NC		%	30
			Chloroform	2021/09/24	NC		%	30
			Dibromochloromethane	2021/09/24	NC		%	30
			1,2-Dichlorobenzene	2021/09/24	NC		%	30
			1,3-Dichlorobenzene	2021/09/24	NC		%	30
			1,4-Dichlorobenzene	2021/09/24	NC		%	30
			Dichlorodifluoromethane (FREON 12)	2021/09/24	NC		%	30
			1,1-Dichloroethane	2021/09/24	NC		%	30
			1,2-Dichloroethane	2021/09/24	NC		%	30
			1,1-Dichloroethylene	2021/09/24	NC		%	30
			cis-1,2-Dichloroethylene	2021/09/24	NC		%	30
			trans-1,2-Dichloroethylene	2021/09/24	NC		%	30
			1,2-Dichloropropane	2021/09/24	NC		%	30

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			cis-1,3-Dichloropropene	2021/09/24	NC		%	30
			trans-1,3-Dichloropropene	2021/09/24	NC		%	30
			Ethylbenzene	2021/09/24	NC		%	30
			Ethylene Dibromide	2021/09/24	NC		%	30
			Hexane	2021/09/24	NC		%	30
			Methylene Chloride(Dichloromethane)	2021/09/24	NC		%	30
			Methyl Ethyl Ketone (2-Butanone)	2021/09/24	NC		%	30
			Methyl Isobutyl Ketone	2021/09/24	NC		%	30
			Methyl t-butyl ether (MTBE)	2021/09/24	NC		%	30
			Styrene	2021/09/24	NC		%	30
			1,1,1,2-Tetrachloroethane	2021/09/24	NC		%	30
			1,1,2,2-Tetrachloroethane	2021/09/24	NC		%	30
			Tetrachloroethylene	2021/09/24	NC		%	30
			Toluene	2021/09/24	NC		%	30
			1,1,1-Trichloroethane	2021/09/24	NC		%	30
			1,1,2-Trichloroethane	2021/09/24	NC		%	30
			Trichloroethylene	2021/09/24	NC		%	30
			Trichlorofluoromethane (FREON 11)	2021/09/24	NC		%	30
			Vinyl Chloride	2021/09/24	NC		%	30
			p+m-Xylene	2021/09/24	NC		%	30
			o-Xylene	2021/09/24	NC		%	30
			Total Xylenes	2021/09/24	NC		%	30
			F1 (C6-C10)	2021/09/24	NC		%	30
			F1 (C6-C10) - BTEX	2021/09/24	NC		%	30
7592614	SAU	Spiked Blank	Alkalinity (Total as CaCO ₃)	2021/09/22		98	%	85 - 115
7592614	SAU	Method Blank	Alkalinity (Total as CaCO ₃)	2021/09/22	<1.0		mg/L	
7592614	SAU	RPD [QRX484-01]	Alkalinity (Total as CaCO ₃)	2021/09/22	0.68		%	20
7592624	SAU	Spiked Blank	Conductivity	2021/09/22		100	%	85 - 115
7592624	SAU	Method Blank	Conductivity	2021/09/22	<1.0		umho/cm	
7592624	SAU	RPD [QRX484-01]	Conductivity	2021/09/22	0.41		%	25
7592626	SAU	Spiked Blank	pH	2021/09/22		102	%	98 - 103
7592626	SAU	RPD [QRX484-01]	pH	2021/09/22	0.66		%	N/A
7592627	ADB	Matrix Spike [QRX484-01]	Dissolved Chloride (Cl-)	2021/09/22		NC	%	80 - 120
7592627	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2021/09/22		100	%	80 - 120
7592627	ADB	Method Blank	Dissolved Chloride (Cl-)	2021/09/22	<1.0		mg/L	
7592627	ADB	RPD [QRX484-01]	Dissolved Chloride (Cl-)	2021/09/22	3.1		%	20
7592635	AKD	Matrix Spike [QRX484-01]	Dissolved Sulphate (SO ₄)	2021/09/22		NC	%	75 - 125
7592635	AKD	Spiked Blank	Dissolved Sulphate (SO ₄)	2021/09/22		99	%	80 - 120
7592635	AKD	Method Blank	Dissolved Sulphate (SO ₄)	2021/09/22	<1.0		mg/L	
7592635	AKD	RPD [QRX484-01]	Dissolved Sulphate (SO ₄)	2021/09/22	0.080		%	20
7592896	VRO	Matrix Spike	Total Ammonia-N	2021/09/23		100	%	75 - 125
7592896	VRO	Spiked Blank	Total Ammonia-N	2021/09/23		100	%	80 - 120
7592896	VRO	Method Blank	Total Ammonia-N	2021/09/23	<0.050		mg/L	
7592896	VRO	RPD	Total Ammonia-N	2021/09/23	NC		%	20
7593803	ADA	Matrix Spike	Dissolved (0.2u) Aluminum (Al)	2021/09/23		105	%	80 - 120
7593803	ADA	Spiked Blank	Dissolved (0.2u) Aluminum (Al)	2021/09/23		105	%	80 - 120
7593803	ADA	Method Blank	Dissolved (0.2u) Aluminum (Al)	2021/09/23	<5		ug/L	
7593803	ADA	RPD	Dissolved (0.2u) Aluminum (Al)	2021/09/23	0.58		%	20
7595605	MEN	Matrix Spike	Dissolved Mercury (Hg)	2021/09/23		94	%	75 - 125
7595605	MEN	Spiked Blank	Dissolved Mercury (Hg)	2021/09/23		96	%	80 - 120
7595605	MEN	Method Blank	Dissolved Mercury (Hg)	2021/09/23	<0.10		ug/L	



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7595605	MEN	RPD	Dissolved Mercury (Hg)	2021/09/23	NC		%	20
7596771	RAJ	Matrix Spike	D10-Anthracene	2021/09/24		84	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		92	%	50 - 130
			D8-Acenaphthylene	2021/09/24		72	%	50 - 130
			Acenaphthene	2021/09/24		71	%	50 - 130
			Acenaphthylene	2021/09/24		68	%	50 - 130
			Anthracene	2021/09/24		77	%	50 - 130
			Benzo(a)anthracene	2021/09/24		86	%	50 - 130
			Benzo(a)pyrene	2021/09/24		71	%	50 - 130
			Benzo(b/j)fluoranthene	2021/09/24		82	%	50 - 130
			Benzo(g,h,i)perylene	2021/09/24		61	%	50 - 130
			Benzo(k)fluoranthene	2021/09/24		83	%	50 - 130
			Chrysene	2021/09/24		87	%	50 - 130
			Dibenzo(a,h)anthracene	2021/09/24		59	%	50 - 130
			Fluoranthene	2021/09/24		92	%	50 - 130
			Fluorene	2021/09/24		74	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/09/24		66	%	50 - 130
			1-Methylnaphthalene	2021/09/24		70	%	50 - 130
			2-Methylnaphthalene	2021/09/24		66	%	50 - 130
			Naphthalene	2021/09/24		63	%	50 - 130
			Phenanthrene	2021/09/24		82	%	50 - 130
			Pyrene	2021/09/24		90	%	50 - 130
7596771	RAJ	Spiked Blank	D10-Anthracene	2021/09/24		101	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		105	%	50 - 130
			D8-Acenaphthylene	2021/09/24		98	%	50 - 130
			Acenaphthene	2021/09/24		91	%	50 - 130
			Acenaphthylene	2021/09/24		89	%	50 - 130
			Anthracene	2021/09/24		92	%	50 - 130
			Benzo(a)anthracene	2021/09/24		106	%	50 - 130
			Benzo(a)pyrene	2021/09/24		91	%	50 - 130
			Benzo(b/j)fluoranthene	2021/09/24		99	%	50 - 130
			Benzo(g,h,i)perylene	2021/09/24		87	%	50 - 130
			Benzo(k)fluoranthene	2021/09/24		110	%	50 - 130
			Chrysene	2021/09/24		105	%	50 - 130
			Dibenzo(a,h)anthracene	2021/09/24		70	%	50 - 130
			Fluoranthene	2021/09/24		103	%	50 - 130
			Fluorene	2021/09/24		94	%	50 - 130
			Indeno(1,2,3-cd)pyrene	2021/09/24		95	%	50 - 130
			1-Methylnaphthalene	2021/09/24		90	%	50 - 130
			2-Methylnaphthalene	2021/09/24		86	%	50 - 130
			Naphthalene	2021/09/24		82	%	50 - 130
			Phenanthrene	2021/09/24		98	%	50 - 130
			Pyrene	2021/09/24		102	%	50 - 130
7596771	RAJ	RPD	Acenaphthene	2021/09/24	1.4		%	30
			Acenaphthylene	2021/09/24	1.6		%	30
			Anthracene	2021/09/24	2.0		%	30
			Benzo(a)anthracene	2021/09/24	1.6		%	30
			Benzo(a)pyrene	2021/09/24	1.6		%	30
			Benzo(b/j)fluoranthene	2021/09/24	0.93		%	30
			Benzo(g,h,i)perylene	2021/09/24	3.6		%	30
			Benzo(k)fluoranthene	2021/09/24	1.8		%	30



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7596771	RAJ	Method Blank	Chrysene	2021/09/24	0.11		%	30
			Dibenzo(a,h)anthracene	2021/09/24	7.5		%	30
			Fluoranthene	2021/09/24	6.7		%	30
			Fluorene	2021/09/24	1.8		%	30
			Indeno(1,2,3-cd)pyrene	2021/09/24	3.7		%	30
			1-Methylnaphthalene	2021/09/24	0.14		%	30
			2-Methylnaphthalene	2021/09/24	0.89		%	30
			Naphthalene	2021/09/24	1.3		%	30
			Phenanthrene	2021/09/24	1.6		%	30
			Pyrene	2021/09/24	5.8		%	30
			D10-Anthracene	2021/09/24		103	%	50 - 130
			D14-Terphenyl (FS)	2021/09/24		111	%	50 - 130
			D8-Acenaphthylene	2021/09/24		94	%	50 - 130
			Acenaphthene	2021/09/24	<0.010		ug/L	
			Acenaphthylene	2021/09/24	<0.010		ug/L	
			Anthracene	2021/09/24	<0.010		ug/L	
			Benzo(a)anthracene	2021/09/24	<0.010		ug/L	
			Benzo(a)pyrene	2021/09/24	<0.0090		ug/L	
			Benzo(b,j)fluoranthene	2021/09/24	<0.010		ug/L	
			Benzo(g,h,i)perylene	2021/09/24	<0.010		ug/L	
			Benzo(k)fluoranthene	2021/09/24	<0.010		ug/L	
			Chrysene	2021/09/24	<0.010		ug/L	
			Dibenzo(a,h)anthracene	2021/09/24	<0.010		ug/L	
			Fluoranthene	2021/09/24	<0.010		ug/L	
			Fluorene	2021/09/24	<0.010		ug/L	
			Indeno(1,2,3-cd)pyrene	2021/09/24	<0.010		ug/L	
			1-Methylnaphthalene	2021/09/24	<0.010		ug/L	
			2-Methylnaphthalene	2021/09/24	<0.010		ug/L	
			Naphthalene	2021/09/24	<0.010		ug/L	
			Phenanthrene	2021/09/24	<0.010		ug/L	
			Pyrene	2021/09/24	<0.010		ug/L	
7597851	KTR	Matrix Spike	o-Terphenyl	2021/09/24		96	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24		98	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/09/24		94	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/09/24		95	%	60 - 130
7597851	KTR	Spiked Blank	o-Terphenyl	2021/09/24		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24		97	%	60 - 130
			F3 (C16-C34 Hydrocarbons)	2021/09/24		96	%	60 - 130
			F4 (C34-C50 Hydrocarbons)	2021/09/24		95	%	60 - 130
7597851	KTR	Method Blank	o-Terphenyl	2021/09/24		97	%	60 - 130
			F2 (C10-C16 Hydrocarbons)	2021/09/24	<100		ug/L	
			F3 (C16-C34 Hydrocarbons)	2021/09/24	<200		ug/L	
			F4 (C34-C50 Hydrocarbons)	2021/09/24	<200		ug/L	
7597851	KTR	RPD	F2 (C10-C16 Hydrocarbons)	2021/09/24	NC		%	30
			F3 (C16-C34 Hydrocarbons)	2021/09/24	NC		%	30
			F4 (C34-C50 Hydrocarbons)	2021/09/24	NC		%	30
7598188	DT1	Matrix Spike	Total Aluminum (Al)	2021/09/24		107	%	80 - 120
			Total Antimony (Sb)	2021/09/24		118	%	80 - 120
			Total Arsenic (As)	2021/09/24		104	%	80 - 120
			Total Barium (Ba)	2021/09/24		102	%	80 - 120
			Total Beryllium (Be)	2021/09/24		104	%	80 - 120



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7598188	DT1	Spiked Blank	Total Bismuth (Bi)	2021/09/24		92	%	80 - 120
			Total Boron (B)	2021/09/24		101	%	80 - 120
			Total Cadmium (Cd)	2021/09/24		105	%	80 - 120
			Total Calcium (Ca)	2021/09/24		NC	%	80 - 120
			Total Chromium (Cr)	2021/09/24		97	%	80 - 120
			Total Cobalt (Co)	2021/09/24		101	%	80 - 120
			Total Copper (Cu)	2021/09/24		107	%	80 - 120
			Total Iron (Fe)	2021/09/24		97	%	80 - 120
			Total Lead (Pb)	2021/09/24		97	%	80 - 120
			Total Lithium (Li)	2021/09/24		108	%	80 - 120
			Total Magnesium (Mg)	2021/09/24		97	%	80 - 120
			Total Manganese (Mn)	2021/09/24		99	%	80 - 120
			Total Molybdenum (Mo)	2021/09/24		109	%	80 - 120
			Total Nickel (Ni)	2021/09/24		96	%	80 - 120
			Total Potassium (K)	2021/09/24		100	%	80 - 120
			Total Selenium (Se)	2021/09/24		104	%	80 - 120
			Total Silicon (Si)	2021/09/24		98	%	80 - 120
			Total Silver (Ag)	2021/09/24		102	%	80 - 120
			Total Sodium (Na)	2021/09/24		NC	%	80 - 120
			Total Strontium (Sr)	2021/09/24		103	%	80 - 120
			Total Tellurium (Te)	2021/09/24		103	%	80 - 120
			Total Thallium (Tl)	2021/09/24		86	%	80 - 120
			Total Tin (Sn)	2021/09/24		106	%	80 - 120
			Total Titanium (Ti)	2021/09/24		100	%	80 - 120
			Total Tungsten (W)	2021/09/24		104	%	80 - 120
			Total Uranium (U)	2021/09/24		96	%	80 - 120
			Total Vanadium (V)	2021/09/24		101	%	80 - 120
			Total Zinc (Zn)	2021/09/24		101	%	80 - 120
			Total Zirconium (Zr)	2021/09/24		111	%	80 - 120
			Total Aluminum (Al)	2021/09/24		97	%	80 - 120
			Total Antimony (Sb)	2021/09/24		113	%	80 - 120
			Total Arsenic (As)	2021/09/24		104	%	80 - 120
			Total Barium (Ba)	2021/09/24		101	%	80 - 120
			Total Beryllium (Be)	2021/09/24		102	%	80 - 120
			Total Bismuth (Bi)	2021/09/24		94	%	80 - 120
			Total Boron (B)	2021/09/24		97	%	80 - 120
			Total Cadmium (Cd)	2021/09/24		102	%	80 - 120
			Total Calcium (Ca)	2021/09/24		100	%	80 - 120
			Total Chromium (Cr)	2021/09/24		100	%	80 - 120
			Total Cobalt (Co)	2021/09/24		102	%	80 - 120
			Total Copper (Cu)	2021/09/24		104	%	80 - 120
			Total Iron (Fe)	2021/09/24		100	%	80 - 120
			Total Lead (Pb)	2021/09/24		98	%	80 - 120
			Total Lithium (Li)	2021/09/24		107	%	80 - 120
			Total Magnesium (Mg)	2021/09/24		100	%	80 - 120
			Total Manganese (Mn)	2021/09/24		101	%	80 - 120
			Total Molybdenum (Mo)	2021/09/24		106	%	80 - 120
			Total Nickel (Ni)	2021/09/24		99	%	80 - 120
			Total Potassium (K)	2021/09/24		102	%	80 - 120
			Total Selenium (Se)	2021/09/24		102	%	80 - 120
			Total Silicon (Si)	2021/09/24		99	%	80 - 120

BUREAU
VERITASBV Labs Job #: C1R1207
Report Date: 2021/09/29Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7598188	DT1	Method Blank	Total Silver (Ag)	2021/09/24		104	%	80 - 120
			Total Sodium (Na)	2021/09/24		97	%	80 - 120
			Total Strontium (Sr)	2021/09/24		100	%	80 - 120
			Total Tellurium (Te)	2021/09/24		101	%	80 - 120
			Total Thallium (Tl)	2021/09/24		97	%	80 - 120
			Total Tin (Sn)	2021/09/24		101	%	80 - 120
			Total Titanium (Ti)	2021/09/24		96	%	80 - 120
			Total Tungsten (W)	2021/09/24		102	%	80 - 120
			Total Uranium (U)	2021/09/24		96	%	80 - 120
			Total Vanadium (V)	2021/09/24		100	%	80 - 120
			Total Zinc (Zn)	2021/09/24		105	%	80 - 120
			Total Zirconium (Zr)	2021/09/24		105	%	80 - 120
			Total Aluminum (Al)	2021/09/24	<4.9		ug/L	
			Total Antimony (Sb)	2021/09/24	<0.50		ug/L	
			Total Arsenic (As)	2021/09/24	<1.0		ug/L	
			Total Barium (Ba)	2021/09/24	<2.0		ug/L	
			Total Beryllium (Be)	2021/09/24	<0.40		ug/L	
			Total Bismuth (Bi)	2021/09/24	<1.0		ug/L	
			Total Boron (B)	2021/09/24	<10		ug/L	
			Total Cadmium (Cd)	2021/09/24	<0.090		ug/L	
			Total Calcium (Ca)	2021/09/24	<200		ug/L	
			Total Chromium (Cr)	2021/09/24	<5.0		ug/L	
			Total Cobalt (Co)	2021/09/24	<0.50		ug/L	
			Total Copper (Cu)	2021/09/24	<0.90		ug/L	
			Total Iron (Fe)	2021/09/24	<100		ug/L	
			Total Lead (Pb)	2021/09/24	<0.50		ug/L	
			Total Lithium (Li)	2021/09/24	<5.0		ug/L	
			Total Magnesium (Mg)	2021/09/24	<50		ug/L	
			Total Manganese (Mn)	2021/09/24	<2.0		ug/L	
			Total Molybdenum (Mo)	2021/09/24	<0.50		ug/L	
			Total Nickel (Ni)	2021/09/24	<1.0		ug/L	
			Total Potassium (K)	2021/09/24	<200		ug/L	
			Total Selenium (Se)	2021/09/24	<2.0		ug/L	
			Total Silicon (Si)	2021/09/24	<50		ug/L	
			Total Silver (Ag)	2021/09/24	<0.090		ug/L	
			Total Sodium (Na)	2021/09/24	<100		ug/L	
			Total Strontium (Sr)	2021/09/24	<1.0		ug/L	
			Total Tellurium (Te)	2021/09/24	<1.0		ug/L	
			Total Thallium (Tl)	2021/09/24	<0.050		ug/L	
			Total Tin (Sn)	2021/09/24	<1.0		ug/L	
			Total Titanium (Ti)	2021/09/24	<5.0		ug/L	
			Total Tungsten (W)	2021/09/24	<1.0		ug/L	
			Total Uranium (U)	2021/09/24	<0.10		ug/L	
			Total Vanadium (V)	2021/09/24	<0.50		ug/L	
			Total Zinc (Zn)	2021/09/24	<5.0		ug/L	



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zirconium (Zr)	2021/09/24	<1.0		ug/L	
N/A = Not Applicable								
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.								
Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.								
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.								
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.								
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.								
NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)								
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).								



BUREAU
VERITAS

BV Labs Job #: C1R1207
Report Date: 2021/09/29

Golder Associates Ltd
Client Project #: 11-1170-0043
Site Location: HWS BARRIE
Sampler Initials: DP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anastassia Hamanov, Scientific Specialist

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



Your Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 36818

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2022/01/17
Report #: R6965469
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y3063

Received: 2021/12/07, 11:46

Sample Matrix: Tedlar Bag
Samples Received: 3

Analyses	Date		Date Analyzed	Laboratory Method	Analytical Method
	Quantity	Extracted			
Hydrogen Sulfide	3	N/A	2021/12/07	CAM SOP-00220	GC/FPD
Light Hydrocarbons	3	N/A	2022/01/14	CAM SOP-00204	GC/FID
Matrix Gases (1)	3	N/A	2021/12/18	CAM SOP-00225	GC/TCD
Volatile Organics in Air (ug/m3)	3	N/A	2021/12/13	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	2	N/A	2021/12/07	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	1	N/A	2021/12/08	BRL SOP-00304	EPA TO-15 m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) Argon interferes with Oxygen and is included in the reported Oxygen concentration. The atmosphere contains about 0.9% Argon.

(2) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.



Your Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 36818

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2022/01/17
Report #: R6965469
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C1Y3063

Received: 2021/12/07, 11:46

Please Note: SUMMA® canister samples will be retained by Bureau Veritas Laboratories for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Cristina (Maria) Bacchus, Project Manager
Email: maria.bacchus@bureauveritas.com
Phone# (905)817-5763

=====

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



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

RESULTS OF ANALYSES OF TEDLAR BAG

Bureau Veritas ID		RHH492	RHH493	RHH494		
Sampling Date		2021/12/06 14:00	2021/12/06 14:30	2021/12/06 15:00		
COC Number		36818	36818	36818		
	UNITS	GVP1	GVP2	GVP3	RDL	QC Batch
Gas						
Methane	ppm	21	440	18	10	7781689
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						



**BUREAU
VERITAS**

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

COMPRESSED GAS PARAMETERS (TEDLAR BAG)

Bureau Veritas ID		RHH492			RHH492			RHH493	RHH494		
Sampling Date		2021/12/06 14:00			2021/12/06 14:00			2021/12/06 14:30	2021/12/06 15:00		
COC Number		36818			36818			36818	36818		
	UNITS	GVP1	RDL	QC Batch	GVP1 Lab-Dup	RDL	QC Batch	GVP2	GVP3	RDL	QC Batch
Fixed Gases											
Oxygen	% v/v	21.1	0.1	7738731				20.8	21.1	0.1	7738731
Nitrogen	% v/v	78.8	0.1	7738731				78.9	78.8	0.1	7738731
Carbon Monoxide	% v/v	<0.1	0.1	7738731				<0.1	<0.1	0.1	7738731
Methane	% v/v	<0.1	0.1	7738731				<0.1	<0.1	0.1	7738731
Carbon Dioxide	% v/v	0.1	0.1	7738731				0.3	<0.1	0.1	7738731
Gas											
Hydrogen sulfide	ppmv	<0.6	0.6	7721145	<0.6	0.6	7721145	<0.6	<0.6	0.6	7721145
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate											



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493			RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30			2021/12/06 15:00		
COC Number		36818		36818			36818		
	UNITS	GVP1	RDL	GVP2	RDL	QC Batch	GVP3	RDL	QC Batch
Volatile Organics									
Dichlorodifluoromethane (FREON 12)	ppbv	1.14	0.40	176	0.40	7725035	9.66	0.20	7714612
1,2-Dichlorotetrafluoroethane	ppbv	0.65	0.34	<4.1	4.1	7725035	<0.17	0.17	7714612
Chloromethane	ppbv	<0.60	0.60	<0.60	0.60	7725035	0.47	0.30	7714612
Vinyl Chloride	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Chloroethane	ppbv	<0.60	0.60	<0.60	0.60	7725035	<0.30	0.30	7714612
1,3-Butadiene	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
Trichlorofluoromethane (FREON 11)	ppbv	<0.40	0.40	<0.40	0.40	7725035	0.27	0.20	7714612
Ethanol (ethyl alcohol)	ppbv	144	2.0	60.0	2.0	7725035	87.8	1.0	7714612
Trichlorotrifluoroethane	ppbv	<0.30	0.30	<0.30	0.30	7725035	<0.15	0.15	7714612
2-propanol	ppbv	36.3	2.0	13.1	2.0	7725035	6.4	1.0	7714612
2-Propanone	ppbv	5.0	1.2	3.9	1.2	7725035	6.50	0.60	7714612
Methyl Ethyl Ketone (2-Butanone)	ppbv	0.57	0.40	0.62	0.40	7725035	0.75	0.20	7714612
Methyl Isobutyl Ketone	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Methyl Butyl Ketone (2-Hexanone)	ppbv	<2.0	2.0	<2.0	2.0	7725035	<1.0	1.0	7714612
Methyl t-butyl ether (MTBE)	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Ethyl Acetate	ppbv	2.3	2.0	<2.0	2.0	7725035	12.6	1.0	7714612
1,1-Dichloroethylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
cis-1,2-Dichloroethylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
trans-1,2-Dichloroethylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Methylene Chloride(Dichloromethane)	ppbv	<1.2	1.2	<1.2	1.2	7725035	0.62	0.60	7714612
Chloroform	ppbv	<0.20	0.20	<0.20	0.20	7725035	0.16	0.10	7714612
Carbon Tetrachloride	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,1-Dichloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,2-Dichloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Ethylene Dibromide	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,1,1-Trichloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,1,2-Trichloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,1,2,2-Tetrachloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
cis-1,3-Dichloropropene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
trans-1,3-Dichloropropene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,2-Dichloropropane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493			RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30			2021/12/06 15:00		
COC Number		36818		36818			36818		
	UNITS	GVP1	RDL	GVP2	RDL	QC Batch	GVP3	RDL	QC Batch
Bromomethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Bromoform	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Bromodichloromethane	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Dibromochloromethane	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Trichloroethylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Tetrachloroethylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Benzene	ppbv	0.22	0.20	<0.20	0.20	7725035	0.57	0.10	7714612
Toluene	ppbv	0.99	0.20	1.13	0.20	7725035	7.32	0.10	7714612
Ethylbenzene	ppbv	<0.20	0.20	<0.20	0.20	7725035	0.55	0.10	7714612
p+m-Xylene	ppbv	<0.40	0.40	<0.40	0.40	7725035	2.23	0.20	7714612
o-Xylene	ppbv	<0.20	0.20	<0.20	0.20	7725035	0.77	0.10	7714612
Styrene	ppbv	<0.20	0.20	<0.20	0.20	7725035	0.21	0.10	7714612
4-ethyltoluene	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
1,3,5-Trimethylbenzene	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
1,2,4-Trimethylbenzene	ppbv	<1.0	1.0	<1.0	1.0	7725035	1.20	0.50	7714612
Chlorobenzene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Benzyl chloride	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
1,3-Dichlorobenzene	ppbv	<0.80	0.80	<0.80	0.80	7725035	<0.40	0.40	7714612
1,4-Dichlorobenzene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,2-Dichlorobenzene	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
1,2,4-Trichlorobenzene	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
Hexachlorobutadiene	ppbv	<1.0	1.0	<1.0	1.0	7725035	<0.50	0.50	7714612
Hexane	ppbv	0.56	0.40	0.51	0.40	7725035	0.40	0.20	7714612
Heptane	ppbv	<0.60	0.60	<0.60	0.60	7725035	0.49	0.30	7714612
Cyclohexane	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Tetrahydrofuran	ppbv	<0.80	0.80	<0.80	0.80	7725035	<0.40	0.40	7714612
1,4-Dioxane	ppbv	<2.0	2.0	<2.0	2.0	7725035	<1.0	1.0	7714612
Naphthalene	ppbv	<0.40	0.40	<0.40	0.40	7725035	0.29	0.20	7714612
Total Xylenes	ppbv	<0.60	0.60	<0.60	0.60	7725035	3.00	0.30	7714612
1,1,1,2-Tetrachloroethane	ppbv	<0.20	0.20	<0.20	0.20	7725035	<0.10	0.10	7714612
Vinyl Bromide	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Propene	ppbv	<2.1	2.1	<2.5	2.5	7725035	<0.80	0.80	7714612
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493			RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30			2021/12/06 15:00		
COC Number		36818		36818			36818		
	UNITS	GVP1	RDL	GVP2	RDL	QC Batch	GVP3	RDL	QC Batch
2,2,4-Trimethylpentane	ppbv	<0.40	0.40	<0.40	0.40	7725035	0.23	0.20	7714612
Carbon Disulfide	ppbv	<1.0	1.0	<1.0	1.0	7725035	2.46	0.50	7714612
Vinyl Acetate	ppbv	<0.40	0.40	<0.40	0.40	7725035	<0.20	0.20	7714612
Surrogate Recovery (%)									
Bromochloromethane	%	96		99		7725035	86		7714612
D5-Chlorobenzene	%	90		92		7725035	86		7714612
Difluorobenzene	%	93		97		7725035	87		7714612
RDL = Reportable Detection Limit									
QC Batch = Quality Control Batch									

BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493		RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30		2021/12/06 15:00		
COC Number		36818		36818		36818		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Calculated Parameters								
Dichlorodifluoromethane (FREON 12)	ug/m3	5.6	2.0	873	2.0	47.8	0.99	7714159
1,2-Dichlorotetrafluoroethane	ug/m3	4.5	2.4	<29	29	<1.2	1.2	7714159
Chloromethane	ug/m3	<1.2	1.2	<1.2	1.2	0.97	0.62	7714159
Vinyl Chloride	ug/m3	<0.51	0.51	<0.51	0.51	<0.26	0.26	7714159
Chloroethane	ug/m3	<1.6	1.6	<1.6	1.6	<0.79	0.79	7714159
1,3-Butadiene	ug/m3	<2.2	2.2	<2.2	2.2	<1.1	1.1	7714159
Trichlorofluoromethane (FREON 11)	ug/m3	<2.2	2.2	<2.2	2.2	1.5	1.1	7714159
Ethanol (ethyl alcohol)	ug/m3	272	3.8	113	3.8	165	1.9	7714159
Trichlorotrifluoroethane	ug/m3	<2.3	2.3	<2.3	2.3	<1.2	1.2	7714159
2-propanol	ug/m3	89.2	4.9	32.1	4.9	15.7	2.5	7714159
2-Propanone	ug/m3	11.8	2.9	9.3	2.9	15.4	1.4	7714159
Methyl Ethyl Ketone (2-Butanone)	ug/m3	1.7	1.2	1.8	1.2	2.21	0.59	7714159
Methyl Isobutyl Ketone	ug/m3	<1.6	1.6	<1.6	1.6	<0.82	0.82	7714159
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<8.2	8.2	<8.2	8.2	<4.1	4.1	7714159
Methyl t-butyl ether (MTBE)	ug/m3	<1.4	1.4	<1.4	1.4	<0.72	0.72	7714159
Ethyl Acetate	ug/m3	8.3	7.2	<7.2	7.2	45.3	3.6	7714159
1,1-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.40	0.40	7714159
cis-1,2-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.40	0.40	7714159
trans-1,2-Dichloroethylene	ug/m3	<0.79	0.79	<0.79	0.79	<0.40	0.40	7714159
Methylene Chloride(Dichloromethane)	ug/m3	<4.2	4.2	<4.2	4.2	2.2	2.1	7714159
Chloroform	ug/m3	<0.98	0.98	<0.98	0.98	0.76	0.49	7714159
Carbon Tetrachloride	ug/m3	<1.3	1.3	<1.3	1.3	<0.63	0.63	7714159
1,1-Dichloroethane	ug/m3	<0.81	0.81	<0.81	0.81	<0.40	0.40	7714159
1,2-Dichloroethane	ug/m3	<0.81	0.81	<0.81	0.81	<0.40	0.40	7714159
Ethylene Dibromide	ug/m3	<1.5	1.5	<1.5	1.5	<0.77	0.77	7714159
1,1,1-Trichloroethane	ug/m3	<1.1	1.1	<1.1	1.1	<0.55	0.55	7714159
1,1,2-Trichloroethane	ug/m3	<1.1	1.1	<1.1	1.1	<0.55	0.55	7714159
1,1,2,2-Tetrachloroethane	ug/m3	<1.4	1.4	<1.4	1.4	<0.69	0.69	7714159
cis-1,3-Dichloropropene	ug/m3	<0.91	0.91	<0.91	0.91	<0.45	0.45	7714159
trans-1,3-Dichloropropene	ug/m3	<0.91	0.91	<0.91	0.91	<0.45	0.45	7714159
1,2-Dichloropropane	ug/m3	<0.92	0.92	<0.92	0.92	<0.46	0.46	7714159
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								

BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493		RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30		2021/12/06 15:00		
COC Number		36818		36818		36818		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
Bromomethane	ug/m3	<0.78	0.78	<0.78	0.78	<0.39	0.39	7714159
Bromoform	ug/m3	<4.1	4.1	<4.1	4.1	<2.1	2.1	7714159
Bromodichloromethane	ug/m3	<2.7	2.7	<2.7	2.7	<1.3	1.3	7714159
Dibromochloromethane	ug/m3	<3.4	3.4	<3.4	3.4	<1.7	1.7	7714159
Trichloroethylene	ug/m3	<1.1	1.1	<1.1	1.1	<0.54	0.54	7714159
Tetrachloroethylene	ug/m3	<1.4	1.4	<1.4	1.4	<0.68	0.68	7714159
Benzene	ug/m3	0.69	0.64	<0.64	0.64	1.83	0.32	7714159
Toluene	ug/m3	3.73	0.75	4.25	0.75	27.6	0.38	7714159
Ethylbenzene	ug/m3	<0.87	0.87	<0.87	0.87	2.38	0.43	7714159
p+m-Xylene	ug/m3	<1.7	1.7	<1.7	1.7	9.67	0.87	7714159
o-Xylene	ug/m3	<0.87	0.87	<0.87	0.87	3.34	0.43	7714159
Styrene	ug/m3	<0.85	0.85	<0.85	0.85	0.90	0.43	7714159
4-ethyltoluene	ug/m3	<4.9	4.9	<4.9	4.9	<2.5	2.5	7714159
1,3,5-Trimethylbenzene	ug/m3	<4.9	4.9	<4.9	4.9	<2.5	2.5	7714159
1,2,4-Trimethylbenzene	ug/m3	<4.9	4.9	<4.9	4.9	5.9	2.5	7714159
Chlorobenzene	ug/m3	<0.92	0.92	<0.92	0.92	<0.46	0.46	7714159
Benzyl chloride	ug/m3	<5.2	5.2	<5.2	5.2	<2.6	2.6	7714159
1,3-Dichlorobenzene	ug/m3	<4.8	4.8	<4.8	4.8	<2.4	2.4	7714159
1,4-Dichlorobenzene	ug/m3	<1.2	1.2	<1.2	1.2	<0.60	0.60	7714159
1,2-Dichlorobenzene	ug/m3	<1.2	1.2	<1.2	1.2	<0.60	0.60	7714159
1,2,4-Trichlorobenzene	ug/m3	<7.4	7.4	<7.4	7.4	<3.7	3.7	7714159
Hexachlorobutadiene	ug/m3	<11	11	<11	11	<5.3	5.3	7714159
Hexane	ug/m3	2.0	1.4	1.8	1.4	1.42	0.70	7714159
Heptane	ug/m3	<2.5	2.5	<2.5	2.5	2.0	1.2	7714159
Cyclohexane	ug/m3	<1.4	1.4	<1.4	1.4	<0.69	0.69	7714159
Tetrahydrofuran	ug/m3	<2.4	2.4	<2.4	2.4	<1.2	1.2	7714159
1,4-Dioxane	ug/m3	<7.2	7.2	<7.2	7.2	<3.6	3.6	7714159
Naphthalene	ug/m3	<2.1	2.1	<2.1	2.1	1.5	1.0	7714159
Total Xylenes	ug/m3	<2.6	2.6	<2.6	2.6	13.0	1.3	7714159
1,1,1,2-Tetrachloroethane	ug/m3	<1.4	1.4	<1.4	1.4	<0.69	0.69	7714159
Vinyl Bromide	ug/m3	<1.8	1.8	<1.8	1.8	<0.87	0.87	7714159
Propene	ug/m3	<3.6	3.6	<4.3	4.3	<1.4	1.4	7714159
RDL = Reportable Detection Limit								
QC Batch = Quality Control Batch								



CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH492		RHH493		RHH494		
Sampling Date		2021/12/06 14:00		2021/12/06 14:30		2021/12/06 15:00		
COC Number		36818		36818		36818		
	UNITS	GVP1	RDL	GVP2	RDL	GVP3	RDL	QC Batch
2,2,4-Trimethylpentane	ug/m3	<1.9	1.9	<1.9	1.9	1.08	0.93	7714159
Carbon Disulfide	ug/m3	<3.1	3.1	<3.1	3.1	7.7	1.6	7714159
Vinyl Acetate	ug/m3	<1.4	1.4	<1.4	1.4	<0.70	0.70	7714159
RDL = Reportable Detection Limit QC Batch = Quality Control Batch								



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063
Report Date: 2022/01/17

Golder Associates Ltd
Client Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

TEST SUMMARY

Bureau Veritas ID: RHH492
Sample ID: GVP1
Matrix: Tedlar Bag

Collected: 2021/12/06
Shipped:
Received: 2021/12/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7721145	N/A	2021/12/07	Iqbal Hasan
Light Hydrocarbons	GC/FID	7781689	N/A	2022/01/14	Shilpa Kataria
Matrix Gases	GC/TCD	7738731	N/A	2021/12/18	Neng (Cathy) Li
Volatile Organics in Air (ug/m3)	GC/MS	7714159	N/A	2021/12/13	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7725035	N/A	2021/12/07	Dany Marqass

Bureau Veritas ID: RHH492 Dup
Sample ID: GVP1
Matrix: Tedlar Bag

Collected: 2021/12/06
Shipped:
Received: 2021/12/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7721145	N/A	2021/12/07	Iqbal Hasan

Bureau Veritas ID: RHH493
Sample ID: GVP2
Matrix: Tedlar Bag

Collected: 2021/12/06
Shipped:
Received: 2021/12/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7721145	N/A	2021/12/07	Iqbal Hasan
Light Hydrocarbons	GC/FID	7781689	N/A	2022/01/14	Shilpa Kataria
Matrix Gases	GC/TCD	7738731	N/A	2021/12/18	Neng (Cathy) Li
Volatile Organics in Air (ug/m3)	GC/MS	7714159	N/A	2021/12/13	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7725035	N/A	2021/12/07	Dany Marqass

Bureau Veritas ID: RHH494
Sample ID: GVP3
Matrix: Tedlar Bag

Collected: 2021/12/06
Shipped:
Received: 2021/12/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Hydrogen Sulfide	GC/FPD	7721145	N/A	2021/12/07	Iqbal Hasan
Light Hydrocarbons	GC/FID	7781689	N/A	2022/01/14	Shilpa Kataria
Matrix Gases	GC/TCD	7738731	N/A	2021/12/18	Neng (Cathy) Li
Volatile Organics in Air (ug/m3)	GC/MS	7714159	N/A	2021/12/13	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7714612	N/A	2021/12/08	Yao Liang Sun



GENERAL COMMENTS

Matrix Gas Analysis: Results normalized to 100% dry volume.

Light Hydrocarbons: The sample was analysed 38 days after the date of sampling. The recommended holding time is 14 days.

Sample RHH492 [GVP1] : Sample was analyzed at a 2X dilution. The DL's were adjusted accordingly.

Increased DL for Propene due to Propane interference.

Sample RHH493 [GVP2] : Sample was analyzed at a 2X dilution. The DL's were adjusted accordingly.

Increased DL for Propene due to Propane interference.

Increased DL for 1,2-Dichlorotetrafluoroethane due to an interference.

Sample RHH494 [GVP3] : Increased DL for propene due to interference from propane.

Results relate only to the items tested.



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063
Report Date: 2022/01/17

Golder Associates Ltd
Client Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7714159	RAE	RPD	Benzene	2021/12/17	2.5		%	25
7714612	LSY	Spiked Blank	Bromochloromethane	2021/12/08		101	%	60 - 140
			D5-Chlorobenzene	2021/12/08		100	%	60 - 140
			Difluorobenzene	2021/12/08		100	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/08		83	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2021/12/08		93	%	70 - 130
			Chloromethane	2021/12/08		87	%	70 - 130
			Vinyl Chloride	2021/12/08		90	%	70 - 130
			Chloroethane	2021/12/08		89	%	70 - 130
			1,3-Butadiene	2021/12/08		88	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/12/08		99	%	70 - 130
			Ethanol (ethyl alcohol)	2021/12/08		88	%	70 - 130
			Trichlorotrifluoroethane	2021/12/08		98	%	70 - 130
			2-propanol	2021/12/08		60 (1)	%	70 - 130
			2-Propanone	2021/12/08		90	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/12/08		94	%	70 - 130
			Methyl Isobutyl Ketone	2021/12/08		89	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2021/12/08		85	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/12/08		93	%	70 - 130
			Ethyl Acetate	2021/12/08		92	%	70 - 130
			1,1-Dichloroethylene	2021/12/08		91	%	70 - 130
			cis-1,2-Dichloroethylene	2021/12/08		87	%	70 - 130
			trans-1,2-Dichloroethylene	2021/12/08		95	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/12/08		89	%	70 - 130
			Chloroform	2021/12/08		94	%	70 - 130
			Carbon Tetrachloride	2021/12/08		111	%	70 - 130
			1,1-Dichloroethane	2021/12/08		91	%	70 - 130
			1,2-Dichloroethane	2021/12/08		90	%	70 - 130
			Ethylene Dibromide	2021/12/08		101	%	70 - 130
			1,1,1-Trichloroethane	2021/12/08		101	%	70 - 130
			1,1,2-Trichloroethane	2021/12/08		98	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/12/08		88	%	70 - 130
			cis-1,3-Dichloropropene	2021/12/08		96	%	70 - 130
			trans-1,3-Dichloropropene	2021/12/08		103	%	70 - 130
			1,2-Dichloropropane	2021/12/08		94	%	70 - 130
			Bromomethane	2021/12/08		97	%	70 - 130
			Bromoform	2021/12/08		119	%	70 - 130
			Bromodichloromethane	2021/12/08		106	%	70 - 130
			Dibromochloromethane	2021/12/08		118	%	70 - 130
			Trichloroethylene	2021/12/08		103	%	70 - 130
			Tetrachloroethylene	2021/12/08		106	%	70 - 130
			Benzene	2021/12/08		95	%	70 - 130
			Toluene	2021/12/08		96	%	70 - 130
			Ethylbenzene	2021/12/08		92	%	70 - 130
			p+m-Xylene	2021/12/08		91	%	70 - 130
			o-Xylene	2021/12/08		89	%	70 - 130
			Styrene	2021/12/08		93	%	70 - 130
			4-ethyltoluene	2021/12/08		101	%	70 - 130
			1,3,5-Trimethylbenzene	2021/12/08		96	%	70 - 130
			1,2,4-Trimethylbenzene	2021/12/08		97	%	70 - 130
			Chlorobenzene	2021/12/08		94	%	70 - 130



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063
Report Date: 2022/01/17

Golder Associates Ltd
Client Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7714612	LSY	Method Blank	Benzyl chloride	2021/12/08		104	%	70 - 130
			1,3-Dichlorobenzene	2021/12/08		103	%	70 - 130
			1,4-Dichlorobenzene	2021/12/08		103	%	70 - 130
			1,2-Dichlorobenzene	2021/12/08		100	%	70 - 130
			1,2,4-Trichlorobenzene	2021/12/08		117	%	70 - 130
			Hexachlorobutadiene	2021/12/08		114	%	70 - 130
			Hexane	2021/12/08		93	%	70 - 130
			Heptane	2021/12/08		92	%	70 - 130
			Cyclohexane	2021/12/08		93	%	70 - 130
			Tetrahydrofuran	2021/12/08		90	%	70 - 130
			1,4-Dioxane	2021/12/08		89	%	70 - 130
			Naphthalene	2021/12/08		107	%	70 - 130
			Total Xylenes	2021/12/08		90	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/12/08		105	%	70 - 130
			Vinyl Bromide	2021/12/08		106	%	70 - 130
			Propene	2021/12/08		84	%	70 - 130
			2,2,4-Trimethylpentane	2021/12/08		100	%	70 - 130
			Carbon Disulfide	2021/12/08		96	%	70 - 130
			Vinyl Acetate	2021/12/08		96	%	70 - 130
			Bromochloromethane	2021/12/08		96	%	60 - 140
			D5-Chlorobenzene	2021/12/08		98	%	60 - 140
			Difluorobenzene	2021/12/08		98	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/08	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2021/12/08	<0.17		ppbv	
			Chloromethane	2021/12/08	<0.30		ppbv	
			Vinyl Chloride	2021/12/08	<0.10		ppbv	
			Chloroethane	2021/12/08	<0.30		ppbv	
			1,3-Butadiene	2021/12/08	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2021/12/08	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2021/12/08	<1.0		ppbv	
			Trichlorotrifluoroethane	2021/12/08	<0.15		ppbv	
			2-propanol	2021/12/08	<1.0		ppbv	
			2-Propanone	2021/12/08	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2021/12/08	<0.20		ppbv	
			Methyl Isobutyl Ketone	2021/12/08	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2021/12/08	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2021/12/08	<0.20		ppbv	
			Ethyl Acetate	2021/12/08	<1.0		ppbv	
			1,1-Dichloroethylene	2021/12/08	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2021/12/08	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2021/12/08	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2021/12/08	<0.60		ppbv	
			Chloroform	2021/12/08	<0.10		ppbv	
			Carbon Tetrachloride	2021/12/08	<0.10		ppbv	
			1,1-Dichloroethane	2021/12/08	<0.10		ppbv	
			1,2-Dichloroethane	2021/12/08	<0.10		ppbv	
			Ethylene Dibromide	2021/12/08	<0.10		ppbv	
			1,1,1-Trichloroethane	2021/12/08	<0.10		ppbv	
			1,1,2-Trichloroethane	2021/12/08	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2021/12/08	<0.10		ppbv	
			cis-1,3-Dichloropropene	2021/12/08	<0.10		ppbv	



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,3-Dichloropropene	2021/12/08	<0.10		ppbv	
			1,2-Dichloropropane	2021/12/08	<0.10		ppbv	
			Bromomethane	2021/12/08	<0.10		ppbv	
			Bromoform	2021/12/08	<0.20		ppbv	
			Bromodichloromethane	2021/12/08	<0.20		ppbv	
			Dibromochloromethane	2021/12/08	<0.20		ppbv	
			Trichloroethylene	2021/12/08	<0.10		ppbv	
			Tetrachloroethylene	2021/12/08	<0.10		ppbv	
			Benzene	2021/12/08	<0.10		ppbv	
			Toluene	2021/12/08	<0.10		ppbv	
			Ethylbenzene	2021/12/08	<0.10		ppbv	
			p+m-Xylene	2021/12/08	<0.20		ppbv	
			o-Xylene	2021/12/08	<0.10		ppbv	
			Styrene	2021/12/08	<0.10		ppbv	
			4-ethyltoluene	2021/12/08	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2021/12/08	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2021/12/08	<0.50		ppbv	
			Chlorobenzene	2021/12/08	<0.10		ppbv	
			Benzyl chloride	2021/12/08	<0.50		ppbv	
			1,3-Dichlorobenzene	2021/12/08	<0.40		ppbv	
			1,4-Dichlorobenzene	2021/12/08	<0.10		ppbv	
			1,2-Dichlorobenzene	2021/12/08	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2021/12/08	<0.50		ppbv	
			Hexachlorobutadiene	2021/12/08	<0.50		ppbv	
			Hexane	2021/12/08	<0.20		ppbv	
			Heptane	2021/12/08	<0.30		ppbv	
			Cyclohexane	2021/12/08	<0.20		ppbv	
			Tetrahydrofuran	2021/12/08	<0.40		ppbv	
			1,4-Dioxane	2021/12/08	<1.0		ppbv	
			Naphthalene	2021/12/08	<0.20		ppbv	
			Total Xylenes	2021/12/08	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2021/12/08	<0.10		ppbv	
			Vinyl Bromide	2021/12/08	<0.20		ppbv	
			Propene	2021/12/08	<0.50		ppbv	
			2,2,4-Trimethylpentane	2021/12/08	<0.20		ppbv	
			Carbon Disulfide	2021/12/08	<0.50		ppbv	
			Vinyl Acetate	2021/12/08	<0.20		ppbv	
7714612	LSY	RPD	Dichlorodifluoromethane (FREON 12)	2021/12/08	2.8		%	25
			1,2-Dichlorotetrafluoroethane	2021/12/08	NC		%	25
			Chloromethane	2021/12/08	3.0		%	25
			Vinyl Chloride	2021/12/08	NC		%	25
			Chloroethane	2021/12/08	NC		%	25
			1,3-Butadiene	2021/12/08	NC		%	25
			Trichlorofluoromethane (FREON 11)	2021/12/08	NC		%	25
			Ethanol (ethyl alcohol)	2021/12/08	3.2		%	25
			Trichlorotrifluoroethane	2021/12/08	NC		%	25
			2-propanol	2021/12/08	NC		%	25
			2-Propanone	2021/12/08	1.8		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/12/08	NC		%	25
			Methyl Isobutyl Ketone	2021/12/08	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2021/12/08	NC		%	25



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl t-butyl ether (MTBE)	2021/12/08	NC		%	25
			Ethyl Acetate	2021/12/08	NC		%	25
			1,1-Dichloroethylene	2021/12/08	NC		%	25
			cis-1,2-Dichloroethylene	2021/12/08	NC		%	25
			trans-1,2-Dichloroethylene	2021/12/08	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/12/08	NC		%	25
			Chloroform	2021/12/08	NC		%	25
			Carbon Tetrachloride	2021/12/08	NC		%	25
			1,1-Dichloroethane	2021/12/08	NC		%	25
			1,2-Dichloroethane	2021/12/08	NC		%	25
			Ethylene Dibromide	2021/12/08	NC		%	25
			1,1,1-Trichloroethane	2021/12/08	NC		%	25
			1,1,2-Trichloroethane	2021/12/08	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/12/08	NC		%	25
			cis-1,3-Dichloropropene	2021/12/08	NC		%	25
			trans-1,3-Dichloropropene	2021/12/08	NC		%	25
			1,2-Dichloropropane	2021/12/08	NC		%	25
			Bromomethane	2021/12/08	NC		%	25
			Bromoform	2021/12/08	NC		%	25
			Bromodichloromethane	2021/12/08	NC		%	25
			Dibromochloromethane	2021/12/08	NC		%	25
			Trichloroethylene	2021/12/08	NC		%	25
			Tetrachloroethylene	2021/12/08	NC		%	25
			Benzene	2021/12/08	NC		%	25
			Toluene	2021/12/08	7.3		%	25
			Ethylbenzene	2021/12/08	NC		%	25
			p+m-Xylene	2021/12/08	NC		%	25
			o-Xylene	2021/12/08	NC		%	25
			Styrene	2021/12/08	NC		%	25
			4-ethyltoluene	2021/12/08	NC		%	25
			1,3,5-Trimethylbenzene	2021/12/08	NC		%	25
			1,2,4-Trimethylbenzene	2021/12/08	NC		%	25
			Chlorobenzene	2021/12/08	NC		%	25
			Benzyl chloride	2021/12/08	NC		%	25
			1,3-Dichlorobenzene	2021/12/08	NC		%	25
			1,4-Dichlorobenzene	2021/12/08	NC		%	25
			1,2-Dichlorobenzene	2021/12/08	NC		%	25
			1,2,4-Trichlorobenzene	2021/12/08	NC		%	25
			Hexachlorobutadiene	2021/12/08	NC		%	25
			Hexane	2021/12/08	4.4		%	25
			Heptane	2021/12/08	NC		%	25
			Cyclohexane	2021/12/08	NC		%	25
			Tetrahydrofuran	2021/12/08	NC		%	25
			1,4-Dioxane	2021/12/08	NC		%	25
			Naphthalene	2021/12/08	NC		%	25
			Total Xylenes	2021/12/08	NC		%	25
			1,1,1,2-Tetrachloroethane	2021/12/08	NC		%	25
			Vinyl Bromide	2021/12/08	NC		%	25
			Propene	2021/12/08	NC		%	25
			2,2,4-Trimethylpentane	2021/12/08	NC		%	25
			Carbon Disulfide	2021/12/08	NC		%	25



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Vinyl Acetate	2021/12/08	NC		%	25
7721145	IHO	Method Blank	Hydrogen sulfide	2021/12/07	<0.4		ppmv	
7721145	IHO	RPD [RHH492-01]	Hydrogen sulfide	2021/12/07	NC		%	20
7725035	DM2	Spiked Blank	Bromochloromethane	2021/12/07		95	%	60 - 140
			D5-Chlorobenzene	2021/12/07		95	%	60 - 140
			Difluorobenzene	2021/12/07		93	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/07		101	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2021/12/07		100	%	70 - 130
			Chloromethane	2021/12/07		93	%	70 - 130
			Vinyl Chloride	2021/12/07		100	%	70 - 130
			Chloroethane	2021/12/07		99	%	70 - 130
			1,3-Butadiene	2021/12/07		103	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/12/07		103	%	70 - 130
			Ethanol (ethyl alcohol)	2021/12/07		126	%	70 - 130
			Trichlorotrifluoroethane	2021/12/07		100	%	70 - 130
			2-propanol	2021/12/07		75	%	70 - 130
			2-Propanone	2021/12/07		102	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07		109	%	70 - 130
			Methyl Isobutyl Ketone	2021/12/07		109	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07		114	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/12/07		112	%	70 - 130
			Ethyl Acetate	2021/12/07		106	%	70 - 130
			1,1-Dichloroethylene	2021/12/07		102	%	70 - 130
			cis-1,2-Dichloroethylene	2021/12/07		99	%	70 - 130
			trans-1,2-Dichloroethylene	2021/12/07		101	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/12/07		101	%	70 - 130
			Chloroform	2021/12/07		100	%	70 - 130
			Carbon Tetrachloride	2021/12/07		112	%	70 - 130
			1,1-Dichloroethane	2021/12/07		101	%	70 - 130
			1,2-Dichloroethane	2021/12/07		100	%	70 - 130
			Ethylene Dibromide	2021/12/07		104	%	70 - 130
			1,1,1-Trichloroethane	2021/12/07		109	%	70 - 130
			1,1,2-Trichloroethane	2021/12/07		101	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/12/07		92	%	70 - 130
			cis-1,3-Dichloropropene	2021/12/07		108	%	70 - 130
			trans-1,3-Dichloropropene	2021/12/07		117	%	70 - 130
			1,2-Dichloropropane	2021/12/07		103	%	70 - 130
			Bromomethane	2021/12/07		103	%	70 - 130
			Bromoform	2021/12/07		104	%	70 - 130
			Bromodichloromethane	2021/12/07		107	%	70 - 130
			Dibromochloromethane	2021/12/07		112	%	70 - 130
			Trichloroethylene	2021/12/07		107	%	70 - 130
			Tetrachloroethylene	2021/12/07		105	%	70 - 130
			Benzene	2021/12/07		101	%	70 - 130
			Toluene	2021/12/07		104	%	70 - 130
			Ethylbenzene	2021/12/07		100	%	70 - 130
			p+m-Xylene	2021/12/07		100	%	70 - 130
			o-Xylene	2021/12/07		92	%	70 - 130
			Styrene	2021/12/07		98	%	70 - 130
			4-ethyltoluene	2021/12/07		112	%	70 - 130
			1,3,5-Trimethylbenzene	2021/12/07		109	%	70 - 130



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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7725035	DM2	Method Blank	1,2,4-Trimethylbenzene	2021/12/07		117	%	70 - 130
			Chlorobenzene	2021/12/07		100	%	70 - 130
			Benzyl chloride	2021/12/07		123	%	70 - 130
			1,3-Dichlorobenzene	2021/12/07		104	%	70 - 130
			1,4-Dichlorobenzene	2021/12/07		106	%	70 - 130
			1,2-Dichlorobenzene	2021/12/07		100	%	70 - 130
			1,2,4-Trichlorobenzene	2021/12/07		115	%	70 - 130
			Hexachlorobutadiene	2021/12/07		102	%	70 - 130
			Hexane	2021/12/07		106	%	70 - 130
			Heptane	2021/12/07		107	%	70 - 130
			Cyclohexane	2021/12/07		106	%	70 - 130
			Tetrahydrofuran	2021/12/07		105	%	70 - 130
			1,4-Dioxane	2021/12/07		109	%	70 - 130
			Naphthalene	2021/12/07		116	%	70 - 130
			Total Xylenes	2021/12/07		97	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/12/07		101	%	70 - 130
			Vinyl Bromide	2021/12/07		113	%	70 - 130
			Propene	2021/12/07		100	%	70 - 130
			2,2,4-Trimethylpentane	2021/12/07		107	%	70 - 130
			Carbon Disulfide	2021/12/07		104	%	70 - 130
			Vinyl Acetate	2021/12/07		116	%	70 - 130
			Bromochloromethane	2021/12/07		100	%	60 - 140
			D5-Chlorobenzene	2021/12/07		91	%	60 - 140
			Difluorobenzene	2021/12/07		98	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/07	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2021/12/07	<0.17		ppbv	
			Chloromethane	2021/12/07	<0.30		ppbv	
			Vinyl Chloride	2021/12/07	<0.10		ppbv	
			Chloroethane	2021/12/07	<0.30		ppbv	
			1,3-Butadiene	2021/12/07	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2021/12/07	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2021/12/07	<1.0		ppbv	
			Trichlorotrifluoroethane	2021/12/07	<0.15		ppbv	
			2-propanol	2021/12/07	<1.0		ppbv	
			2-Propanone	2021/12/07	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07	<0.20		ppbv	
			Methyl Isobutyl Ketone	2021/12/07	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2021/12/07	<0.20		ppbv	
			Ethyl Acetate	2021/12/07	<1.0		ppbv	
			1,1-Dichloroethylene	2021/12/07	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2021/12/07	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2021/12/07	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2021/12/07	<0.60		ppbv	
			Chloroform	2021/12/07	<0.10		ppbv	
			Carbon Tetrachloride	2021/12/07	<0.10		ppbv	
			1,1-Dichloroethane	2021/12/07	<0.10		ppbv	
			1,2-Dichloroethane	2021/12/07	<0.10		ppbv	
			Ethylene Dibromide	2021/12/07	<0.10		ppbv	
			1,1,1-Trichloroethane	2021/12/07	<0.10		ppbv	
			1,1,2-Trichloroethane	2021/12/07	<0.10		ppbv	



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7725035	DM2	RPD	1,1,2,2-Tetrachloroethane	2021/12/07	<0.10		ppbv	
			cis-1,3-Dichloropropene	2021/12/07	<0.10		ppbv	
			trans-1,3-Dichloropropene	2021/12/07	<0.10		ppbv	
			1,2-Dichloropropane	2021/12/07	<0.10		ppbv	
			Bromomethane	2021/12/07	<0.10		ppbv	
			Bromoform	2021/12/07	<0.20		ppbv	
			Bromodichloromethane	2021/12/07	<0.20		ppbv	
			Dibromochloromethane	2021/12/07	<0.20		ppbv	
			Trichloroethylene	2021/12/07	<0.10		ppbv	
			Tetrachloroethylene	2021/12/07	<0.10		ppbv	
			Benzene	2021/12/07	<0.10		ppbv	
			Toluene	2021/12/07	<0.10		ppbv	
			Ethylbenzene	2021/12/07	<0.10		ppbv	
			p+m-Xylene	2021/12/07	<0.20		ppbv	
			o-Xylene	2021/12/07	<0.10		ppbv	
			Styrene	2021/12/07	<0.10		ppbv	
			4-ethyltoluene	2021/12/07	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2021/12/07	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2021/12/07	<0.50		ppbv	
			Chlorobenzene	2021/12/07	<0.10		ppbv	
			Benzyl chloride	2021/12/07	<0.50		ppbv	
			1,3-Dichlorobenzene	2021/12/07	<0.40		ppbv	
			1,4-Dichlorobenzene	2021/12/07	<0.10		ppbv	
			1,2-Dichlorobenzene	2021/12/07	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2021/12/07	<0.50		ppbv	
			Hexachlorobutadiene	2021/12/07	<0.50		ppbv	
			Hexane	2021/12/07	<0.20		ppbv	
			Heptane	2021/12/07	<0.30		ppbv	
			Cyclohexane	2021/12/07	<0.20		ppbv	
			Tetrahydrofuran	2021/12/07	<0.40		ppbv	
			1,4-Dioxane	2021/12/07	<1.0		ppbv	
			Naphthalene	2021/12/07	<0.20		ppbv	
			Total Xylenes	2021/12/07	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2021/12/07	<0.10		ppbv	
			Vinyl Bromide	2021/12/07	<0.20		ppbv	
			Propene	2021/12/07	<0.50		ppbv	
			2,2,4-Trimethylpentane	2021/12/07	<0.20		ppbv	
			Carbon Disulfide	2021/12/07	<0.50		ppbv	
			Vinyl Acetate	2021/12/07	<0.20		ppbv	
			Dichlorodifluoromethane (FREON 12)	2021/12/07	3.0		%	25
			1,2-Dichlorotetrafluoroethane	2021/12/07	NC		%	25
			Chloromethane	2021/12/07	NC		%	25
			Vinyl Chloride	2021/12/07	NC		%	25
			Chloroethane	2021/12/07	NC		%	25
			1,3-Butadiene	2021/12/07	NC		%	25
			Trichlorofluoromethane (FREON 11)	2021/12/07	NC		%	25
			Ethanol (ethyl alcohol)	2021/12/07	5.3		%	25
			Trichlorotrifluoroethane	2021/12/07	NC		%	25
			2-propanol	2021/12/07	8.1		%	25
			2-Propanone	2021/12/07	3.3		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07	6.3		%	25



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl Isobutyl Ketone	2021/12/07	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07	NC		%	25
			Methyl t-butyl ether (MTBE)	2021/12/07	NC		%	25
			Ethyl Acetate	2021/12/07	NC		%	25
			1,1-Dichloroethylene	2021/12/07	NC		%	25
			cis-1,2-Dichloroethylene	2021/12/07	NC		%	25
			trans-1,2-Dichloroethylene	2021/12/07	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/12/07	NC		%	25
			Chloroform	2021/12/07	NC		%	25
			Carbon Tetrachloride	2021/12/07	NC		%	25
			1,1-Dichloroethane	2021/12/07	NC		%	25
			1,2-Dichloroethane	2021/12/07	NC		%	25
			Ethylene Dibromide	2021/12/07	NC		%	25
			1,1,1-Trichloroethane	2021/12/07	NC		%	25
			1,1,2-Trichloroethane	2021/12/07	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/12/07	NC		%	25
			cis-1,3-Dichloropropene	2021/12/07	NC		%	25
			trans-1,3-Dichloropropene	2021/12/07	NC		%	25
			1,2-Dichloropropane	2021/12/07	NC		%	25
			Bromomethane	2021/12/07	NC		%	25
			Bromoform	2021/12/07	NC		%	25
			Bromodichloromethane	2021/12/07	NC		%	25
			Dibromochloromethane	2021/12/07	NC		%	25
			Trichloroethylene	2021/12/07	NC		%	25
			Tetrachloroethylene	2021/12/07	1.8		%	25
			Benzene	2021/12/07	1.8		%	25
			Toluene	2021/12/07	1.7		%	25
			Ethylbenzene	2021/12/07	1.8		%	25
			p+m-Xylene	2021/12/07	0.11		%	25
			o-Xylene	2021/12/07	0.37		%	25
			Styrene	2021/12/07	NC		%	25
			4-ethyltoluene	2021/12/07	NC		%	25
			1,3,5-Trimethylbenzene	2021/12/07	NC		%	25
			1,2,4-Trimethylbenzene	2021/12/07	NC		%	25
			Chlorobenzene	2021/12/07	NC		%	25
			Benzyl chloride	2021/12/07	NC		%	25
			1,3-Dichlorobenzene	2021/12/07	NC		%	25
			1,4-Dichlorobenzene	2021/12/07	NC		%	25
			1,2-Dichlorobenzene	2021/12/07	NC		%	25
			1,2,4-Trichlorobenzene	2021/12/07	NC		%	25
			Hexachlorobutadiene	2021/12/07	NC		%	25
			Hexane	2021/12/07	0.74		%	25
			Heptane	2021/12/07	3.9		%	25
			Cyclohexane	2021/12/07	NC		%	25
			Tetrahydrofuran	2021/12/07	NC		%	25
			1,4-Dioxane	2021/12/07	NC		%	25
			Naphthalene	2021/12/07	NC		%	25
			Total Xylenes	2021/12/07	0.17		%	25
			1,1,1,2-Tetrachloroethane	2021/12/07	NC		%	25
			Vinyl Bromide	2021/12/07	NC		%	25
			Propene	2021/12/07	8.9		%	25



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7738731	CAT	Method Blank	2,2,4-Trimethylpentane	2021/12/07	3.7		%	25
			Carbon Disulfide	2021/12/07	NC		%	25
			Vinyl Acetate	2021/12/07	NC		%	25
			Oxygen	2021/12/18	<0.1		% v/v	
			Nitrogen	2021/12/18	<0.1		% v/v	
			Carbon Monoxide	2021/12/18	<0.1		% v/v	
7738731	CAT	RPD	Methane	2021/12/18	<0.1		% v/v	
			Carbon Dioxide	2021/12/18	<0.1		% v/v	
			Oxygen	2021/12/18	0		%	20
			Nitrogen	2021/12/18	0.038		%	20
			Carbon Monoxide	2021/12/18	NC		%	20
			Methane	2021/12/18	NC		%	20
7781689	SKT	Method Blank	Carbon Dioxide	2021/12/18	3.2		%	20
7781689	SKT	Method Blank	Methane	2022/01/14	<2		ppm	
7781689	SKT	RPD	Methane	2022/01/14	2.9		%	30
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement. Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy. Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination. Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency. NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL). (1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.								



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Melanie Mabini, Team Leader

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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



Your Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 36818

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2022/01/17
Report #: R6965475
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1Y3063

Received: 2021/12/07, 11:46

Sample Matrix: Tedlar Bag
Samples Received: 1

Analyses	Date		Laboratory Method	Analytical Method
	Quantity	Extracted		
Volatile Organics in Air (ug/m3)	1	N/A	2021/12/14 BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (1)	1	N/A	2021/12/07 BRL SOP-00304	EPA TO-15 m

Remarks:

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

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

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.

Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas Laboratories for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.



Your Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Your C.O.C. #: 36818

Attention: Jamie Bonany

Golder Associates Ltd
121 Commerce Park Drive
Unit L
Barrie, ON
CANADA L4N 8X1

Report Date: 2022/01/17
Report #: R6965475
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BV LABS JOB #: C1Y3063

Received: 2021/12/07, 11:46

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Cristina (Maria) Bacchus, Project Manager

Email: maria.bacchus@bureauveritas.com

Phone# (905)817-5763

=====

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



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063
Report Date: 2022/01/17

Golder Associates Ltd
Client Project #: 1111700043
Site Location: SITE 6 PASSIVE VENTING
Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Volatile Organics				
Dichlorodifluoromethane (FREON 12)	ppbv	<0.20	0.20	7725035
1,2-Dichlorotetrafluoroethane	ppbv	<0.17	0.17	7725035
Chloromethane	ppbv	<0.30	0.30	7725035
Vinyl Chloride	ppbv	<0.10	0.10	7725035
Chloroethane	ppbv	<0.30	0.30	7725035
1,3-Butadiene	ppbv	<0.50	0.50	7725035
Trichlorofluoromethane (FREON 11)	ppbv	<0.20	0.20	7725035
Ethanol (ethyl alcohol)	ppbv	6.3	1.0	7725035
Trichlorotrifluoroethane	ppbv	<0.15	0.15	7725035
2-propanol	ppbv	<1.0	1.0	7725035
2-Propanone	ppbv	2.14	0.60	7725035
Methyl Ethyl Ketone (2-Butanone)	ppbv	<0.20	0.20	7725035
Methyl Isobutyl Ketone	ppbv	<0.20	0.20	7725035
Methyl Butyl Ketone (2-Hexanone)	ppbv	<1.0	1.0	7725035
Methyl t-butyl ether (MTBE)	ppbv	<0.20	0.20	7725035
Ethyl Acetate	ppbv	3.3	1.0	7725035
1,1-Dichloroethylene	ppbv	<0.10	0.10	7725035
cis-1,2-Dichloroethylene	ppbv	<0.10	0.10	7725035
trans-1,2-Dichloroethylene	ppbv	<0.10	0.10	7725035
Methylene Chloride(Dichloromethane)	ppbv	<0.60	0.60	7725035
Chloroform	ppbv	<0.10	0.10	7725035
Carbon Tetrachloride	ppbv	<0.10	0.10	7725035
1,1-Dichloroethane	ppbv	<0.10	0.10	7725035
1,2-Dichloroethane	ppbv	<0.10	0.10	7725035
Ethylene Dibromide	ppbv	<0.10	0.10	7725035
1,1,1-Trichloroethane	ppbv	<0.10	0.10	7725035
1,1,2-Trichloroethane	ppbv	<0.10	0.10	7725035
1,1,2,2-Tetrachloroethane	ppbv	<0.10	0.10	7725035
cis-1,3-Dichloropropene	ppbv	<0.10	0.10	7725035
trans-1,3-Dichloropropene	ppbv	<0.10	0.10	7725035
1,2-Dichloropropane	ppbv	<0.10	0.10	7725035
Bromomethane	ppbv	<0.10	0.10	7725035
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Bromoform	ppbv	<0.20	0.20	7725035
Bromodichloromethane	ppbv	<0.20	0.20	7725035
Dibromochloromethane	ppbv	<0.20	0.20	7725035
Trichloroethylene	ppbv	<0.10	0.10	7725035
Tetrachloroethylene	ppbv	<0.10	0.10	7725035
Benzene	ppbv	0.20	0.10	7725035
Toluene	ppbv	2.56	0.10	7725035
Ethylbenzene	ppbv	0.36	0.10	7725035
p+m-Xylene	ppbv	1.52	0.20	7725035
o-Xylene	ppbv	0.53	0.10	7725035
Styrene	ppbv	<0.15	0.15	7725035
4-ethyltoluene	ppbv	<0.50	0.50	7725035
1,3,5-Trimethylbenzene	ppbv	<0.50	0.50	7725035
1,2,4-Trimethylbenzene	ppbv	1.05	0.50	7725035
Chlorobenzene	ppbv	<0.10	0.10	7725035
Benzyl chloride	ppbv	<0.50	0.50	7725035
1,3-Dichlorobenzene	ppbv	<0.40	0.40	7725035
1,4-Dichlorobenzene	ppbv	<0.10	0.10	7725035
1,2-Dichlorobenzene	ppbv	<0.10	0.10	7725035
1,2,4-Trichlorobenzene	ppbv	<0.50	0.50	7725035
Hexachlorobutadiene	ppbv	<0.50	0.50	7725035
Hexane	ppbv	<0.20	0.20	7725035
Heptane	ppbv	<0.30	0.30	7725035
Cyclohexane	ppbv	<0.20	0.20	7725035
Tetrahydrofuran	ppbv	<0.40	0.40	7725035
1,4-Dioxane	ppbv	<1.0	1.0	7725035
Naphthalene	ppbv	0.39	0.20	7725035
Total Xylenes	ppbv	2.05	0.30	7725035
1,1,1,2-Tetrachloroethane	ppbv	<0.10	0.10	7725035
Vinyl Bromide	ppbv	<0.20	0.20	7725035
Propene	ppbv	<0.50	0.50	7725035
2,2,4-Trimethylpentane	ppbv	<0.20	0.20	7725035
Carbon Disulfide	ppbv	1.04	0.50	7725035
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



VOLATILE ORGANICS BY GC/MS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Vinyl Acetate	ppbv	<0.20	0.20	7725035
Surrogate Recovery (%)				
Bromochloromethane	%	96		7725035
D5-Chlorobenzene	%	95		7725035
Difluorobenzene	%	95		7725035
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Calculated Parameters				
Dichlorodifluoromethane (FREON 12)	ug/m3	<0.99	0.99	7714159
1,2-Dichlorotetrafluoroethane	ug/m3	<1.2	1.2	7714159
Chloromethane	ug/m3	<0.62	0.62	7714159
Vinyl Chloride	ug/m3	<0.26	0.26	7714159
Chloroethane	ug/m3	<0.79	0.79	7714159
1,3-Butadiene	ug/m3	<1.1	1.1	7714159
Trichlorofluoromethane (FREON 11)	ug/m3	<1.1	1.1	7714159
Ethanol (ethyl alcohol)	ug/m3	11.9	1.9	7714159
Trichlorotrifluoroethane	ug/m3	<1.2	1.2	7714159
2-propanol	ug/m3	<2.5	2.5	7714159
2-Propanone	ug/m3	5.1	1.4	7714159
Methyl Ethyl Ketone (2-Butanone)	ug/m3	<0.59	0.59	7714159
Methyl Isobutyl Ketone	ug/m3	<0.82	0.82	7714159
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<4.1	4.1	7714159
Methyl t-butyl ether (MTBE)	ug/m3	<0.72	0.72	7714159
Ethyl Acetate	ug/m3	11.7	3.6	7714159
1,1-Dichloroethylene	ug/m3	<0.40	0.40	7714159
cis-1,2-Dichloroethylene	ug/m3	<0.40	0.40	7714159
trans-1,2-Dichloroethylene	ug/m3	<0.40	0.40	7714159
Methylene Chloride(Dichloromethane)	ug/m3	<2.1	2.1	7714159
Chloroform	ug/m3	<0.49	0.49	7714159
Carbon Tetrachloride	ug/m3	<0.63	0.63	7714159
1,1-Dichloroethane	ug/m3	<0.40	0.40	7714159
1,2-Dichloroethane	ug/m3	<0.40	0.40	7714159
Ethylene Dibromide	ug/m3	<0.77	0.77	7714159
1,1,1-Trichloroethane	ug/m3	<0.55	0.55	7714159
1,1,2-Trichloroethane	ug/m3	<0.55	0.55	7714159
1,1,2,2-Tetrachloroethane	ug/m3	<0.69	0.69	7714159
cis-1,3-Dichloropropene	ug/m3	<0.45	0.45	7714159
trans-1,3-Dichloropropene	ug/m3	<0.45	0.45	7714159
1,2-Dichloropropane	ug/m3	<0.46	0.46	7714159
Bromomethane	ug/m3	<0.39	0.39	7714159
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

Report Date: 2022/01/17

Golder Associates Ltd

Client Project #: 1111700043

Site Location: SITE 6 PASSIVE VENTING

Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Bromoform	ug/m3	<2.1	2.1	7714159
Bromodichloromethane	ug/m3	<1.3	1.3	7714159
Dibromochloromethane	ug/m3	<1.7	1.7	7714159
Trichloroethylene	ug/m3	<0.54	0.54	7714159
Tetrachloroethylene	ug/m3	<0.68	0.68	7714159
Benzene	ug/m3	0.63	0.32	7714159
Toluene	ug/m3	9.65	0.38	7714159
Ethylbenzene	ug/m3	1.57	0.43	7714159
p+m-Xylene	ug/m3	6.61	0.87	7714159
o-Xylene	ug/m3	2.29	0.43	7714159
Styrene	ug/m3	<0.64	0.64	7714159
4-ethyltoluene	ug/m3	<2.5	2.5	7714159
1,3,5-Trimethylbenzene	ug/m3	<2.5	2.5	7714159
1,2,4-Trimethylbenzene	ug/m3	5.2	2.5	7714159
Chlorobenzene	ug/m3	<0.46	0.46	7714159
Benzyl chloride	ug/m3	<2.6	2.6	7714159
1,3-Dichlorobenzene	ug/m3	<2.4	2.4	7714159
1,4-Dichlorobenzene	ug/m3	<0.60	0.60	7714159
1,2-Dichlorobenzene	ug/m3	<0.60	0.60	7714159
1,2,4-Trichlorobenzene	ug/m3	<3.7	3.7	7714159
Hexachlorobutadiene	ug/m3	<5.3	5.3	7714159
Hexane	ug/m3	<0.70	0.70	7714159
Heptane	ug/m3	<1.2	1.2	7714159
Cyclohexane	ug/m3	<0.69	0.69	7714159
Tetrahydrofuran	ug/m3	<1.2	1.2	7714159
1,4-Dioxane	ug/m3	<3.6	3.6	7714159
Naphthalene	ug/m3	2.0	1.0	7714159
Total Xylenes	ug/m3	8.9	1.3	7714159
1,1,1,2-Tetrachloroethane	ug/m3	<0.69	0.69	7714159
Vinyl Bromide	ug/m3	<0.87	0.87	7714159
Propene	ug/m3	<0.86	0.86	7714159
2,2,4-Trimethylpentane	ug/m3	<0.93	0.93	7714159
Carbon Disulfide	ug/m3	3.3	1.6	7714159
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



BUREAU
VERITAS

Bureau Veritas Job #: C1Y3063

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Sampler Initials: JB

CALCULATED VOLATILE ORGANICS (TEDLAR BAG)

Bureau Veritas ID		RHH495		
Sampling Date		2021/12/06		
COC Number		36818		
	UNITS	LAB BLANK	RDL	QC Batch
Vinyl Acetate	ug/m3	<0.70	0.70	7714159
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				



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TEST SUMMARY

Bureau Veritas ID: RHH495
Sample ID: LAB BLANK
Matrix: Tedlar Bag

Collected: 2021/12/06
Shipped:
Received: 2021/12/07

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Volatile Organics in Air (ug/m3)	GC/MS	7714159	N/A	2021/12/14	Automated Statchk
Volatile Organics in Air (TO-15)	GC/MS	7725035	N/A	2021/12/07	Dany Marqass



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GENERAL COMMENTS

Matrix Gas Analysis: Results normalized to 100% dry volume.

Light Hydrocarbons: The sample was analysed 38 days after the date of sampling. The recommended holding time is 14 days.

Sample RHH495 [LAB BLANK] : Increased DL for Styrene due to an interference.

Results relate only to the items tested.



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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7714159	RAE	RPD	Benzene	2021/12/17	2.5		%	25
7725035	DM2	Spiked Blank	Bromochloromethane	2021/12/07		95	%	60 - 140
			D5-Chlorobenzene	2021/12/07		95	%	60 - 140
			Difluorobenzene	2021/12/07		93	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/07		101	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2021/12/07		100	%	70 - 130
			Chloromethane	2021/12/07		93	%	70 - 130
			Vinyl Chloride	2021/12/07		100	%	70 - 130
			Chloroethane	2021/12/07		99	%	70 - 130
			1,3-Butadiene	2021/12/07		103	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2021/12/07		103	%	70 - 130
			Ethanol (ethyl alcohol)	2021/12/07		126	%	70 - 130
			Trichlorotrifluoroethane	2021/12/07		100	%	70 - 130
			2-propanol	2021/12/07		75	%	70 - 130
			2-Propanone	2021/12/07		102	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07		109	%	70 - 130
			Methyl Isobutyl Ketone	2021/12/07		109	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07		114	%	70 - 130
			Methyl t-butyl ether (MTBE)	2021/12/07		112	%	70 - 130
			Ethyl Acetate	2021/12/07		106	%	70 - 130
			1,1-Dichloroethylene	2021/12/07		102	%	70 - 130
			cis-1,2-Dichloroethylene	2021/12/07		99	%	70 - 130
			trans-1,2-Dichloroethylene	2021/12/07		101	%	70 - 130
			Methylene Chloride(Dichloromethane)	2021/12/07		101	%	70 - 130
			Chloroform	2021/12/07		100	%	70 - 130
			Carbon Tetrachloride	2021/12/07		112	%	70 - 130
			1,1-Dichloroethane	2021/12/07		101	%	70 - 130
			1,2-Dichloroethane	2021/12/07		100	%	70 - 130
			Ethylene Dibromide	2021/12/07		104	%	70 - 130
			1,1,1-Trichloroethane	2021/12/07		109	%	70 - 130
			1,1,2-Trichloroethane	2021/12/07		101	%	70 - 130
			1,1,2,2-Tetrachloroethane	2021/12/07		92	%	70 - 130
			cis-1,3-Dichloropropene	2021/12/07		108	%	70 - 130
			trans-1,3-Dichloropropene	2021/12/07		117	%	70 - 130
			1,2-Dichloropropane	2021/12/07		103	%	70 - 130
			Bromomethane	2021/12/07		103	%	70 - 130
			Bromoform	2021/12/07		104	%	70 - 130
			Bromodichloromethane	2021/12/07		107	%	70 - 130
			Dibromochloromethane	2021/12/07		112	%	70 - 130
			Trichloroethylene	2021/12/07		107	%	70 - 130
			Tetrachloroethylene	2021/12/07		105	%	70 - 130
			Benzene	2021/12/07		101	%	70 - 130
			Toluene	2021/12/07		104	%	70 - 130
			Ethylbenzene	2021/12/07		100	%	70 - 130
			p+m-Xylene	2021/12/07		100	%	70 - 130
			o-Xylene	2021/12/07		92	%	70 - 130
			Styrene	2021/12/07		98	%	70 - 130
			4-ethyltoluene	2021/12/07		112	%	70 - 130
			1,3,5-Trimethylbenzene	2021/12/07		109	%	70 - 130
			1,2,4-Trimethylbenzene	2021/12/07		117	%	70 - 130
			Chlorobenzene	2021/12/07		100	%	70 - 130



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
7725035	DM2	Method Blank	Benzyl chloride	2021/12/07		123	%	70 - 130
			1,3-Dichlorobenzene	2021/12/07		104	%	70 - 130
			1,4-Dichlorobenzene	2021/12/07		106	%	70 - 130
			1,2-Dichlorobenzene	2021/12/07		100	%	70 - 130
			1,2,4-Trichlorobenzene	2021/12/07		115	%	70 - 130
			Hexachlorobutadiene	2021/12/07		102	%	70 - 130
			Hexane	2021/12/07		106	%	70 - 130
			Heptane	2021/12/07		107	%	70 - 130
			Cyclohexane	2021/12/07		106	%	70 - 130
			Tetrahydrofuran	2021/12/07		105	%	70 - 130
			1,4-Dioxane	2021/12/07		109	%	70 - 130
			Naphthalene	2021/12/07		116	%	70 - 130
			Total Xylenes	2021/12/07		97	%	70 - 130
			1,1,1,2-Tetrachloroethane	2021/12/07		101	%	70 - 130
			Vinyl Bromide	2021/12/07		113	%	70 - 130
			Propene	2021/12/07		100	%	70 - 130
			2,2,4-Trimethylpentane	2021/12/07		107	%	70 - 130
			Carbon Disulfide	2021/12/07		104	%	70 - 130
			Vinyl Acetate	2021/12/07		116	%	70 - 130
			Bromochloromethane	2021/12/07		100	%	60 - 140
			D5-Chlorobenzene	2021/12/07		91	%	60 - 140
			Difluorobenzene	2021/12/07		98	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2021/12/07	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2021/12/07	<0.17		ppbv	
			Chloromethane	2021/12/07	<0.30		ppbv	
			Vinyl Chloride	2021/12/07	<0.10		ppbv	
			Chloroethane	2021/12/07	<0.30		ppbv	
			1,3-Butadiene	2021/12/07	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2021/12/07	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2021/12/07	<1.0		ppbv	
			Trichlorotrifluoroethane	2021/12/07	<0.15		ppbv	
			2-propanol	2021/12/07	<1.0		ppbv	
			2-Propanone	2021/12/07	<0.60		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07	<0.20		ppbv	
			Methyl Isobutyl Ketone	2021/12/07	<0.20		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07	<1.0		ppbv	
			Methyl t-butyl ether (MTBE)	2021/12/07	<0.20		ppbv	
			Ethyl Acetate	2021/12/07	<1.0		ppbv	
			1,1-Dichloroethylene	2021/12/07	<0.10		ppbv	
			cis-1,2-Dichloroethylene	2021/12/07	<0.10		ppbv	
			trans-1,2-Dichloroethylene	2021/12/07	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2021/12/07	<0.60		ppbv	
			Chloroform	2021/12/07	<0.10		ppbv	
			Carbon Tetrachloride	2021/12/07	<0.10		ppbv	
			1,1-Dichloroethane	2021/12/07	<0.10		ppbv	
			1,2-Dichloroethane	2021/12/07	<0.10		ppbv	
			Ethylene Dibromide	2021/12/07	<0.10		ppbv	
			1,1,1-Trichloroethane	2021/12/07	<0.10		ppbv	
			1,1,2-Trichloroethane	2021/12/07	<0.10		ppbv	
			1,1,2,2-Tetrachloroethane	2021/12/07	<0.10		ppbv	
			cis-1,3-Dichloropropene	2021/12/07	<0.10		ppbv	



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			trans-1,3-Dichloropropene	2021/12/07	<0.10		ppbv	
			1,2-Dichloropropane	2021/12/07	<0.10		ppbv	
			Bromomethane	2021/12/07	<0.10		ppbv	
			Bromoform	2021/12/07	<0.20		ppbv	
			Bromodichloromethane	2021/12/07	<0.20		ppbv	
			Dibromochloromethane	2021/12/07	<0.20		ppbv	
			Trichloroethylene	2021/12/07	<0.10		ppbv	
			Tetrachloroethylene	2021/12/07	<0.10		ppbv	
			Benzene	2021/12/07	<0.10		ppbv	
			Toluene	2021/12/07	<0.10		ppbv	
			Ethylbenzene	2021/12/07	<0.10		ppbv	
			p+m-Xylene	2021/12/07	<0.20		ppbv	
			o-Xylene	2021/12/07	<0.10		ppbv	
			Styrene	2021/12/07	<0.10		ppbv	
			4-ethyltoluene	2021/12/07	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2021/12/07	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2021/12/07	<0.50		ppbv	
			Chlorobenzene	2021/12/07	<0.10		ppbv	
			Benzyl chloride	2021/12/07	<0.50		ppbv	
			1,3-Dichlorobenzene	2021/12/07	<0.40		ppbv	
			1,4-Dichlorobenzene	2021/12/07	<0.10		ppbv	
			1,2-Dichlorobenzene	2021/12/07	<0.10		ppbv	
			1,2,4-Trichlorobenzene	2021/12/07	<0.50		ppbv	
			Hexachlorobutadiene	2021/12/07	<0.50		ppbv	
			Hexane	2021/12/07	<0.20		ppbv	
			Heptane	2021/12/07	<0.30		ppbv	
			Cyclohexane	2021/12/07	<0.20		ppbv	
			Tetrahydrofuran	2021/12/07	<0.40		ppbv	
			1,4-Dioxane	2021/12/07	<1.0		ppbv	
			Naphthalene	2021/12/07	<0.20		ppbv	
			Total Xylenes	2021/12/07	<0.30		ppbv	
			1,1,1,2-Tetrachloroethane	2021/12/07	<0.10		ppbv	
			Vinyl Bromide	2021/12/07	<0.20		ppbv	
			Propene	2021/12/07	<0.50		ppbv	
			2,2,4-Trimethylpentane	2021/12/07	<0.20		ppbv	
			Carbon Disulfide	2021/12/07	<0.50		ppbv	
			Vinyl Acetate	2021/12/07	<0.20		ppbv	
7725035	DM2	RPD	Dichlorodifluoromethane (FREON 12)	2021/12/07	3.0		%	25
			1,2-Dichlorotetrafluoroethane	2021/12/07	NC		%	25
			Chloromethane	2021/12/07	NC		%	25
			Vinyl Chloride	2021/12/07	NC		%	25
			Chloroethane	2021/12/07	NC		%	25
			1,3-Butadiene	2021/12/07	NC		%	25
			Trichlorofluoromethane (FREON 11)	2021/12/07	NC		%	25
			Ethanol (ethyl alcohol)	2021/12/07	5.3		%	25
			Trichlorotrifluoroethane	2021/12/07	NC		%	25
			2-propanol	2021/12/07	8.1		%	25
			2-Propanone	2021/12/07	3.3		%	25
			Methyl Ethyl Ketone (2-Butanone)	2021/12/07	6.3		%	25
			Methyl Isobutyl Ketone	2021/12/07	NC		%	25
			Methyl Butyl Ketone (2-Hexanone)	2021/12/07	NC		%	25



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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Methyl t-butyl ether (MTBE)	2021/12/07	NC		%	25
			Ethyl Acetate	2021/12/07	NC		%	25
			1,1-Dichloroethylene	2021/12/07	NC		%	25
			cis-1,2-Dichloroethylene	2021/12/07	NC		%	25
			trans-1,2-Dichloroethylene	2021/12/07	NC		%	25
			Methylene Chloride(Dichloromethane)	2021/12/07	NC		%	25
			Chloroform	2021/12/07	NC		%	25
			Carbon Tetrachloride	2021/12/07	NC		%	25
			1,1-Dichloroethane	2021/12/07	NC		%	25
			1,2-Dichloroethane	2021/12/07	NC		%	25
			Ethylene Dibromide	2021/12/07	NC		%	25
			1,1,1-Trichloroethane	2021/12/07	NC		%	25
			1,1,2-Trichloroethane	2021/12/07	NC		%	25
			1,1,2,2-Tetrachloroethane	2021/12/07	NC		%	25
			cis-1,3-Dichloropropene	2021/12/07	NC		%	25
			trans-1,3-Dichloropropene	2021/12/07	NC		%	25
			1,2-Dichloropropane	2021/12/07	NC		%	25
			Bromomethane	2021/12/07	NC		%	25
			Bromoform	2021/12/07	NC		%	25
			Bromodichloromethane	2021/12/07	NC		%	25
			Dibromochloromethane	2021/12/07	NC		%	25
			Trichloroethylene	2021/12/07	NC		%	25
			Tetrachloroethylene	2021/12/07	1.8		%	25
			Benzene	2021/12/07	1.8		%	25
			Toluene	2021/12/07	1.7		%	25
			Ethylbenzene	2021/12/07	1.8		%	25
			p+m-Xylene	2021/12/07	0.11		%	25
			o-Xylene	2021/12/07	0.37		%	25
			Styrene	2021/12/07	NC		%	25
			4-ethyltoluene	2021/12/07	NC		%	25
			1,3,5-Trimethylbenzene	2021/12/07	NC		%	25
			1,2,4-Trimethylbenzene	2021/12/07	NC		%	25
			Chlorobenzene	2021/12/07	NC		%	25
			Benzyl chloride	2021/12/07	NC		%	25
			1,3-Dichlorobenzene	2021/12/07	NC		%	25
			1,4-Dichlorobenzene	2021/12/07	NC		%	25
			1,2-Dichlorobenzene	2021/12/07	NC		%	25
			1,2,4-Trichlorobenzene	2021/12/07	NC		%	25
			Hexachlorobutadiene	2021/12/07	NC		%	25
			Hexane	2021/12/07	0.74		%	25
			Heptane	2021/12/07	3.9		%	25
			Cyclohexane	2021/12/07	NC		%	25
			Tetrahydrofuran	2021/12/07	NC		%	25
			1,4-Dioxane	2021/12/07	NC		%	25
			Naphthalene	2021/12/07	NC		%	25
			Total Xylenes	2021/12/07	0.17		%	25
			1,1,1,2-Tetrachloroethane	2021/12/07	NC		%	25
			Vinyl Bromide	2021/12/07	NC		%	25
			Propene	2021/12/07	8.9		%	25
			2,2,4-Trimethylpentane	2021/12/07	3.7		%	25
			Carbon Disulfide	2021/12/07	NC		%	25



QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Vinyl Acetate	2021/12/07	NC		%	25
Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.									
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.									
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.									
Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.									
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference $\leq 2 \times$ RDL).									



BUREAU
VERITAS

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Golder Associates Ltd
Client Project #: 1111700043
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Sampler Initials: JB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

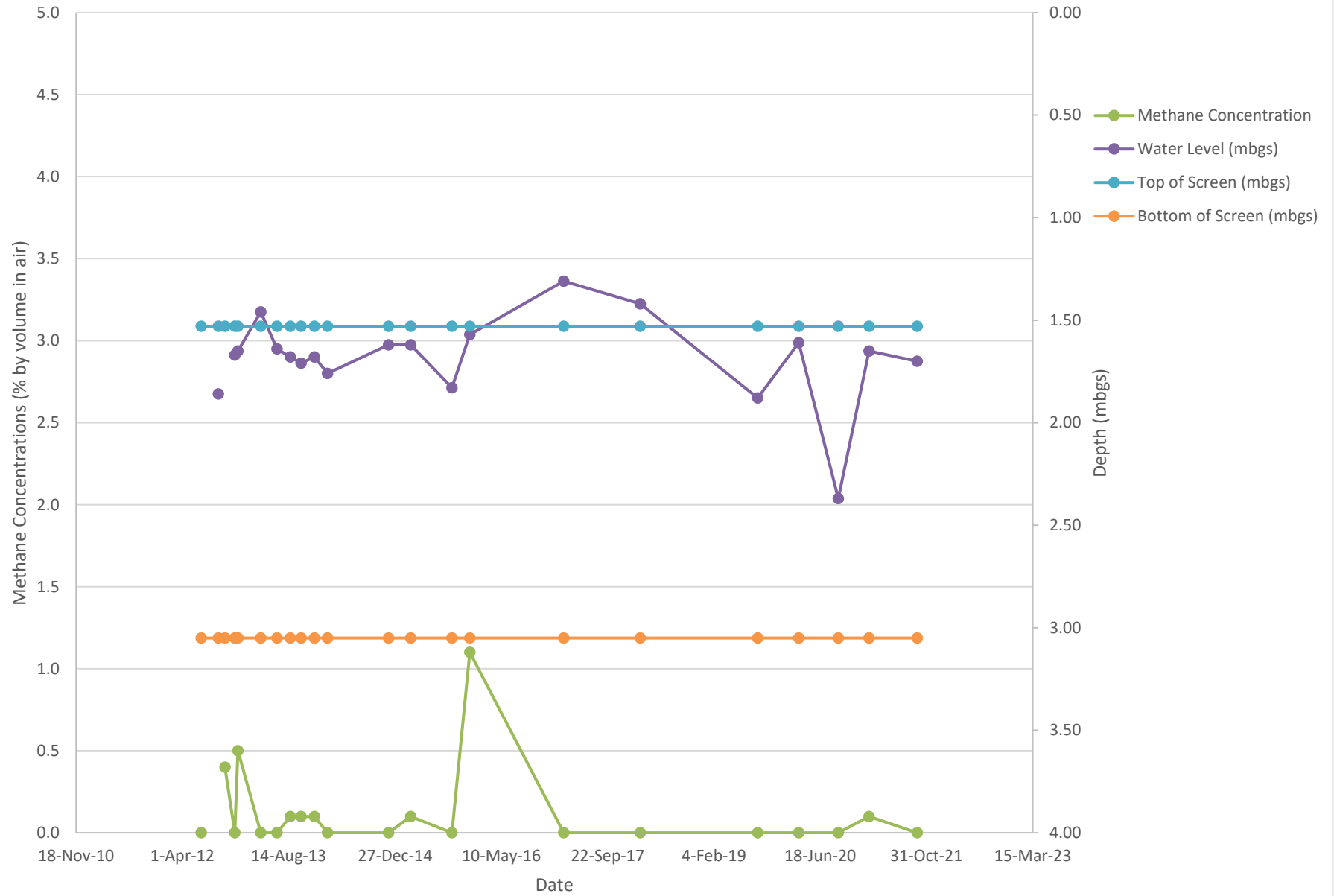
Melanie Mabini, Team Leader

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

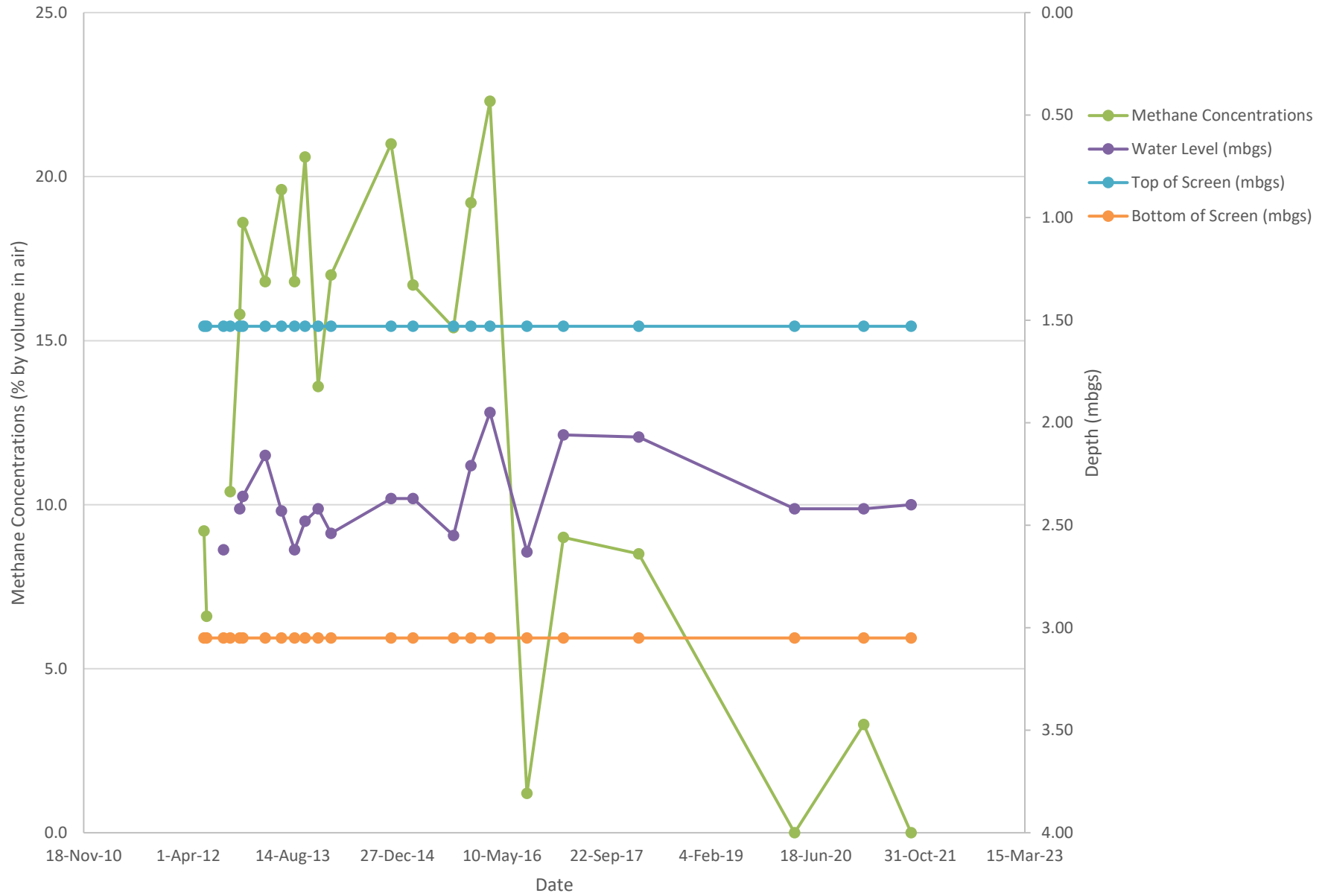
APPENDIX D

Landfill Gas Graphs

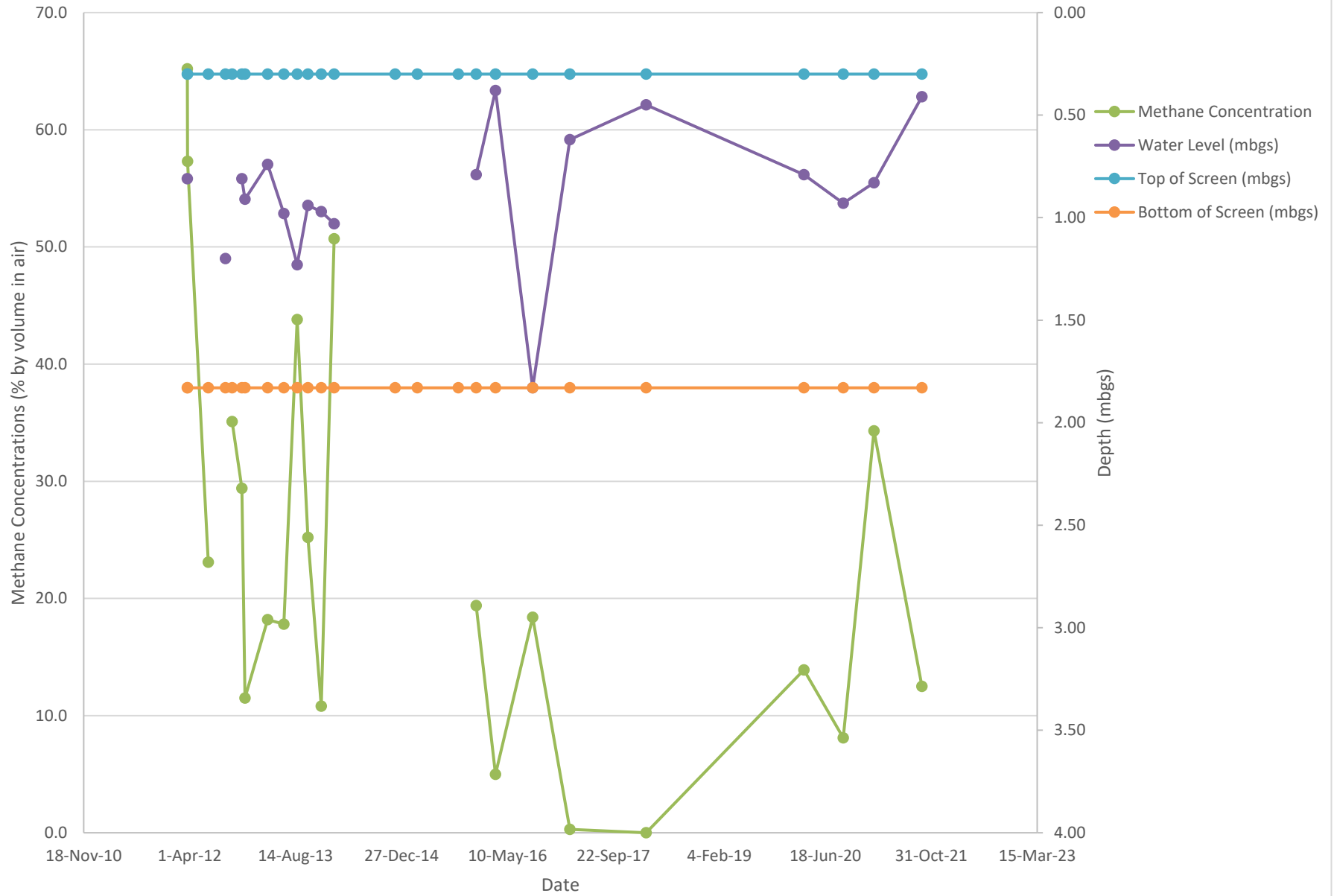
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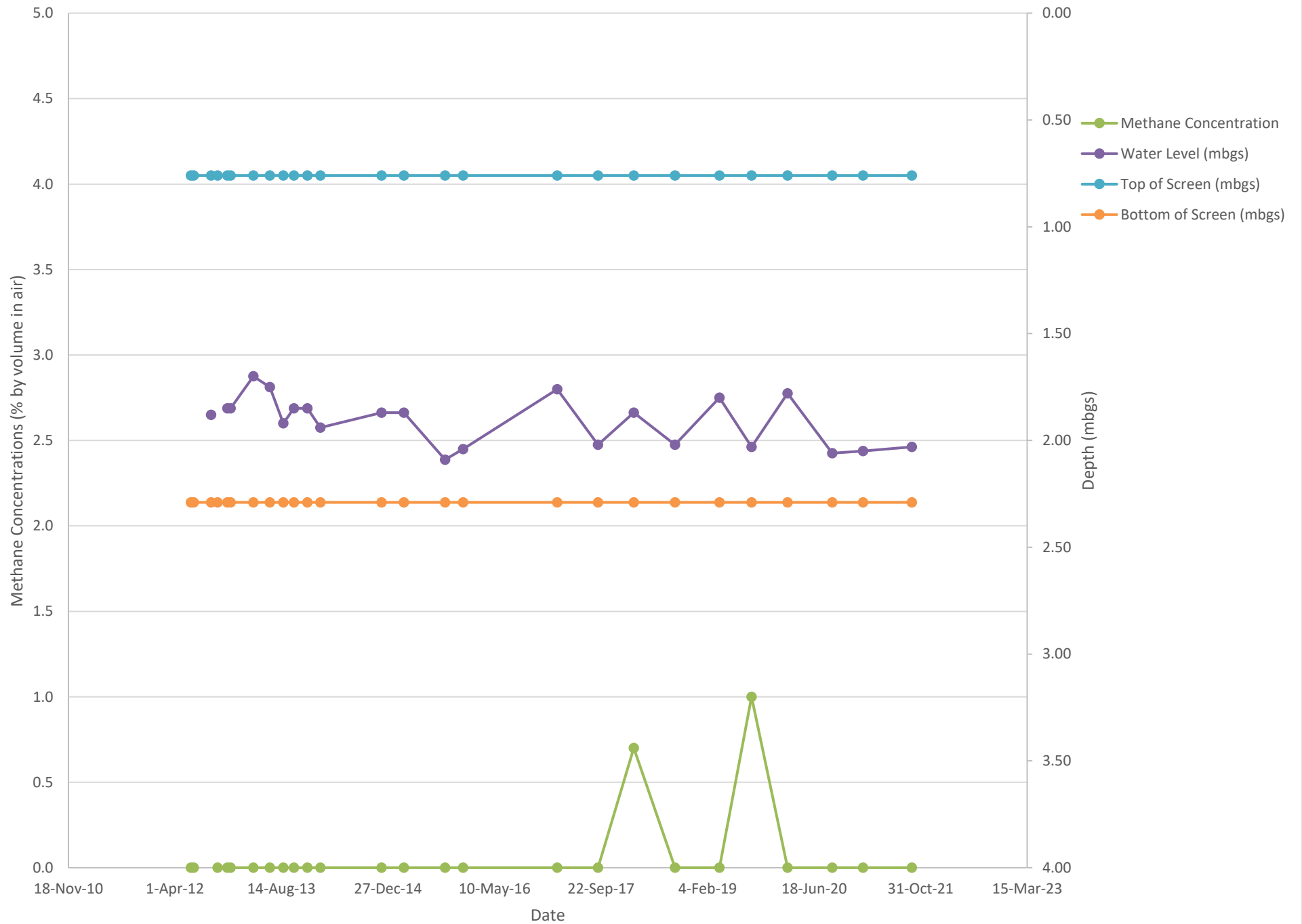
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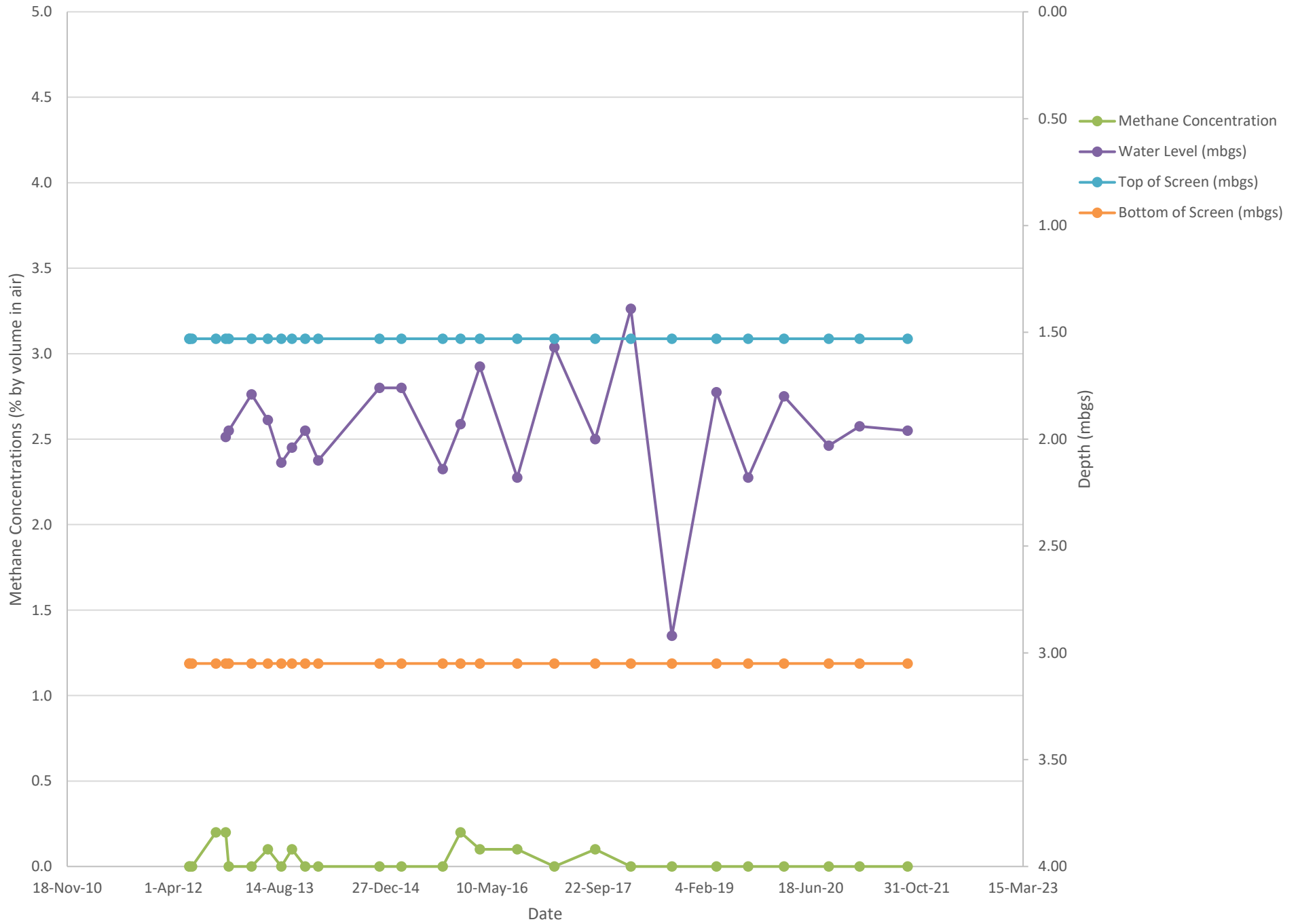
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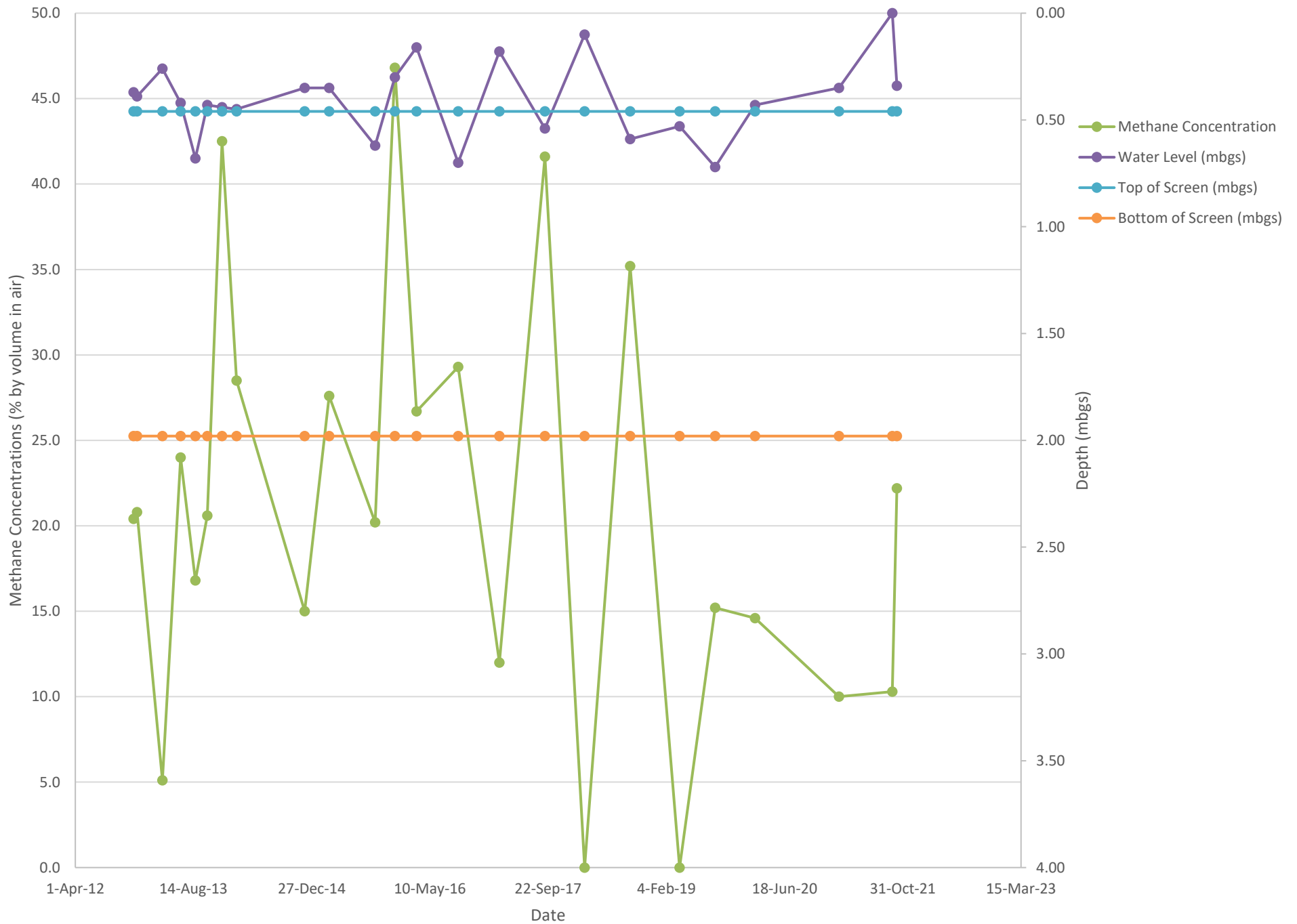
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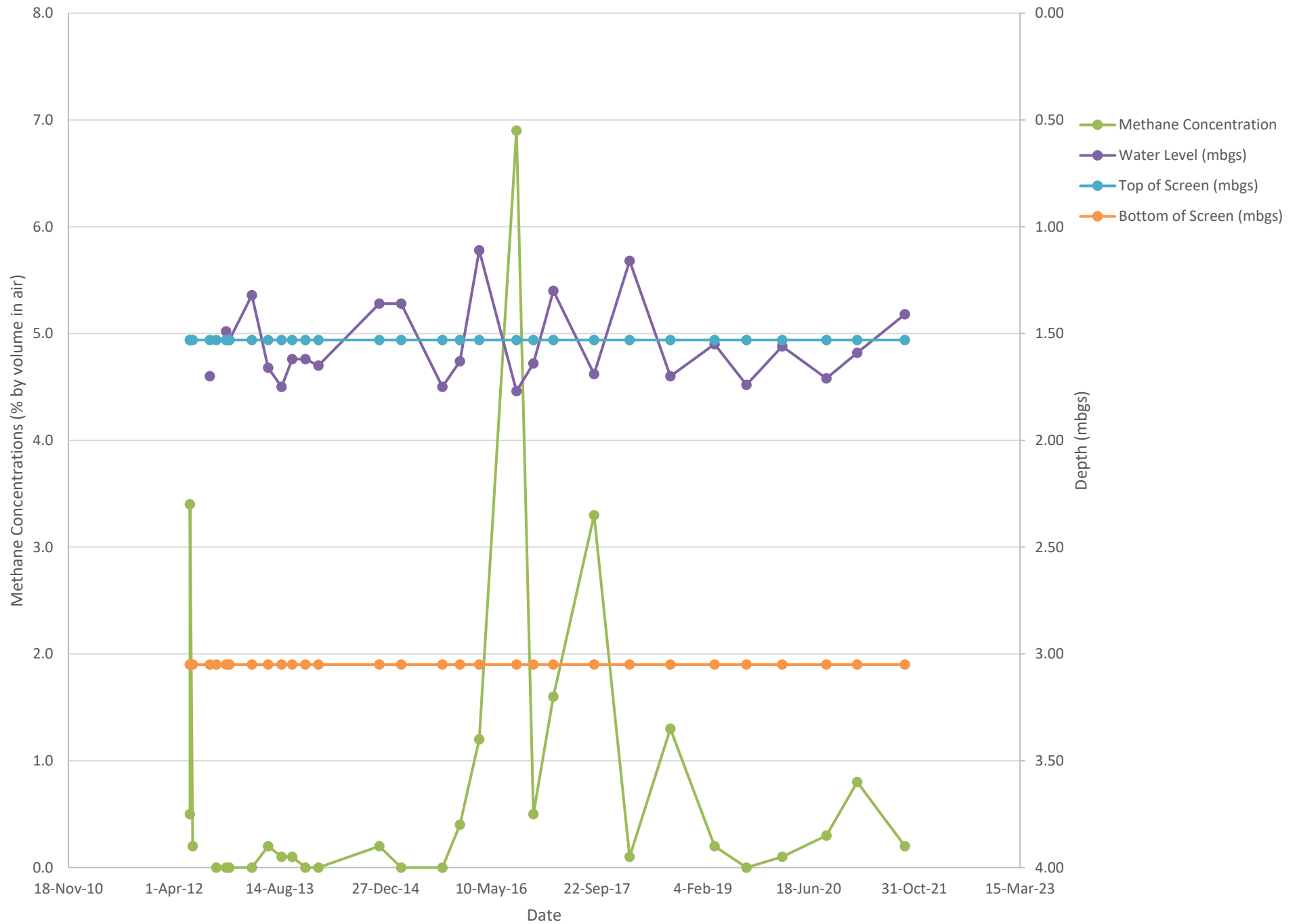
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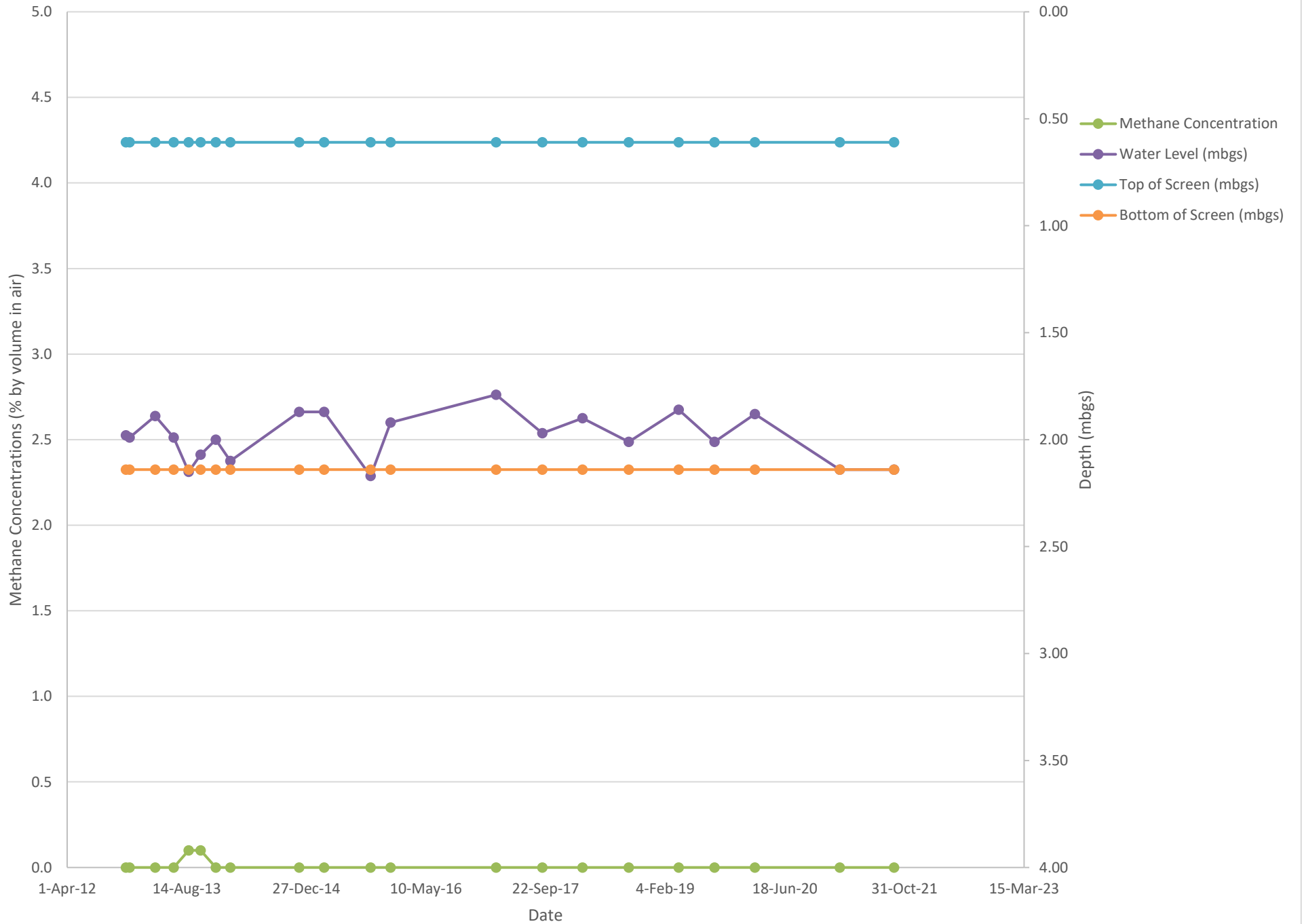
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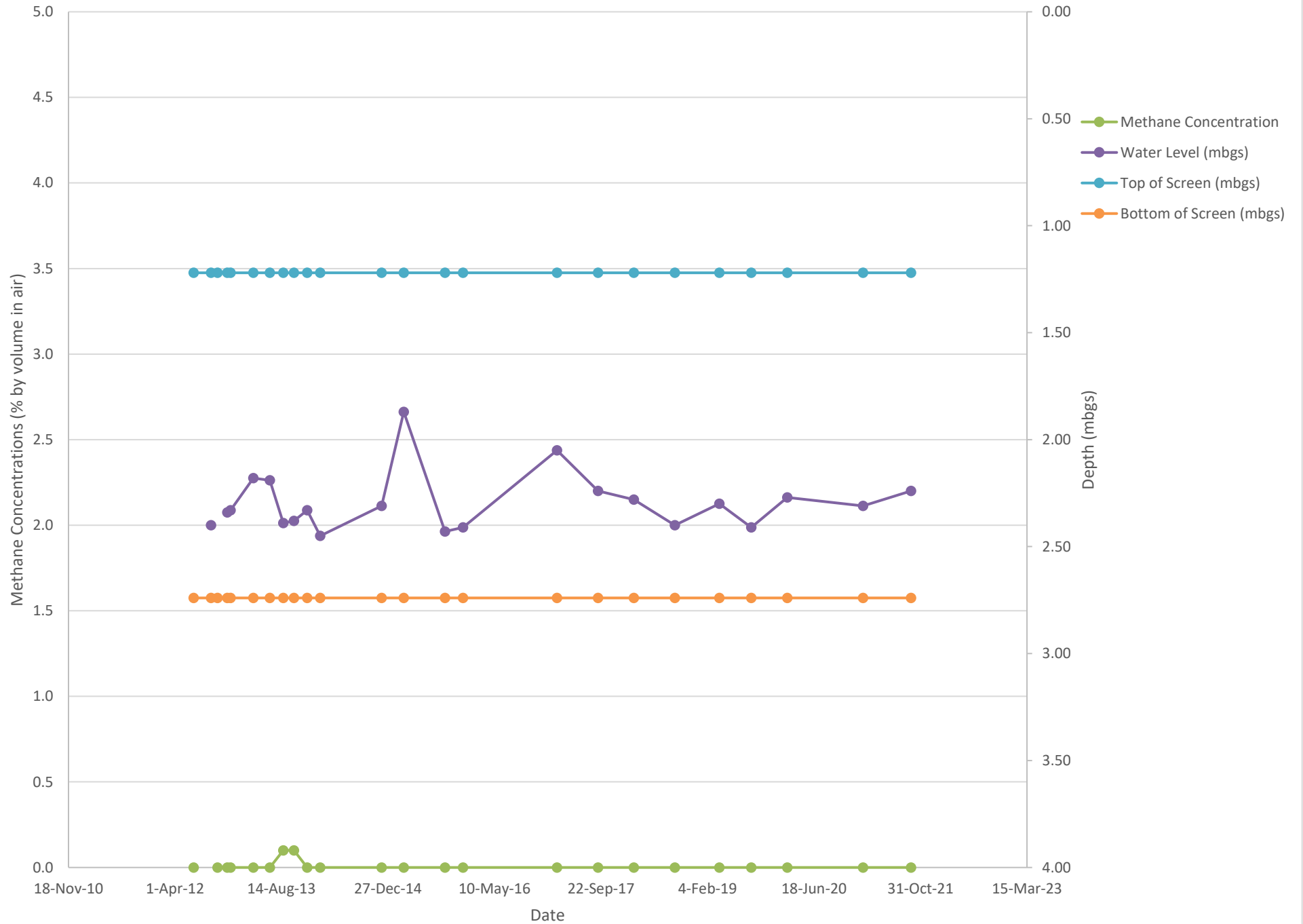
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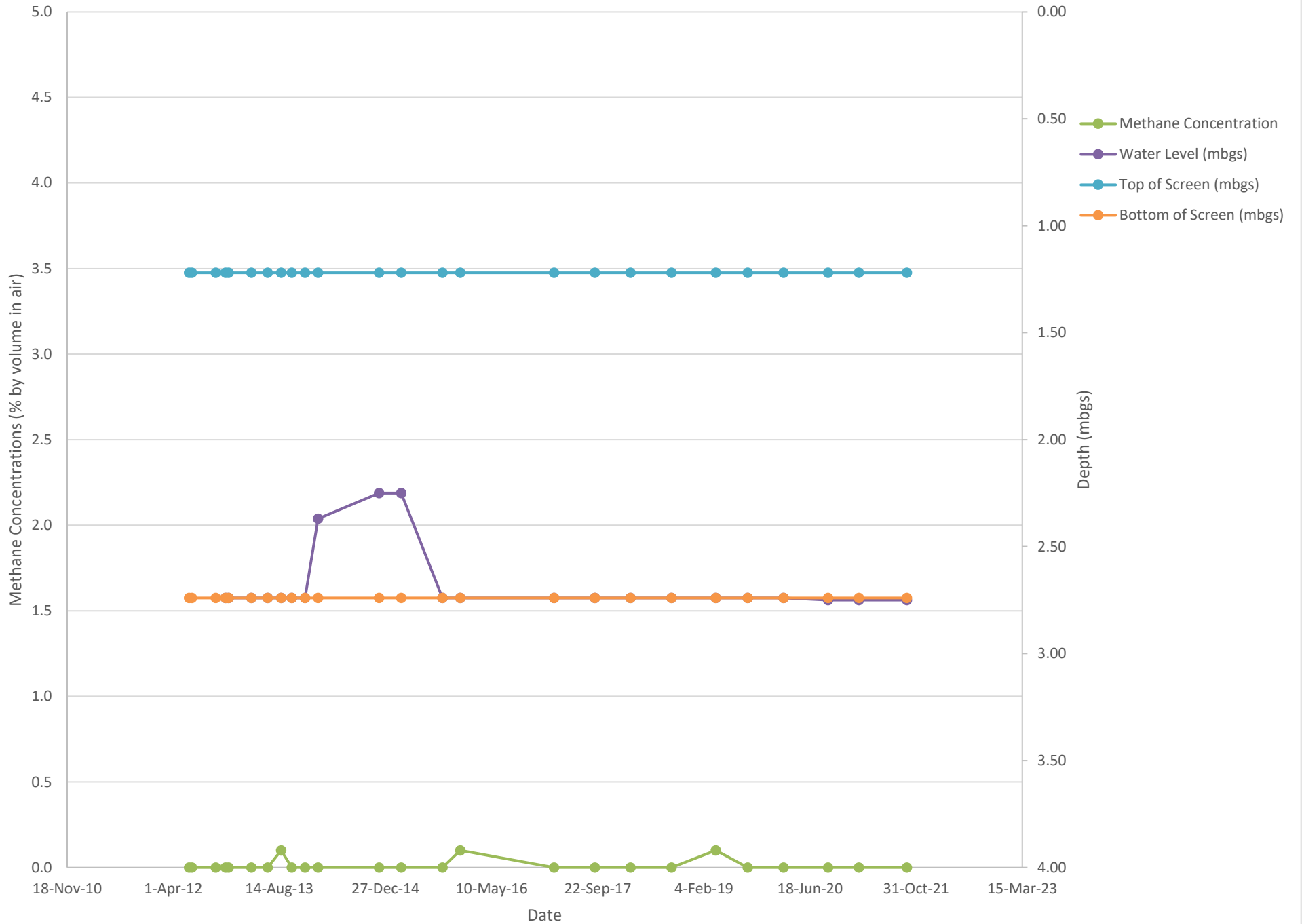
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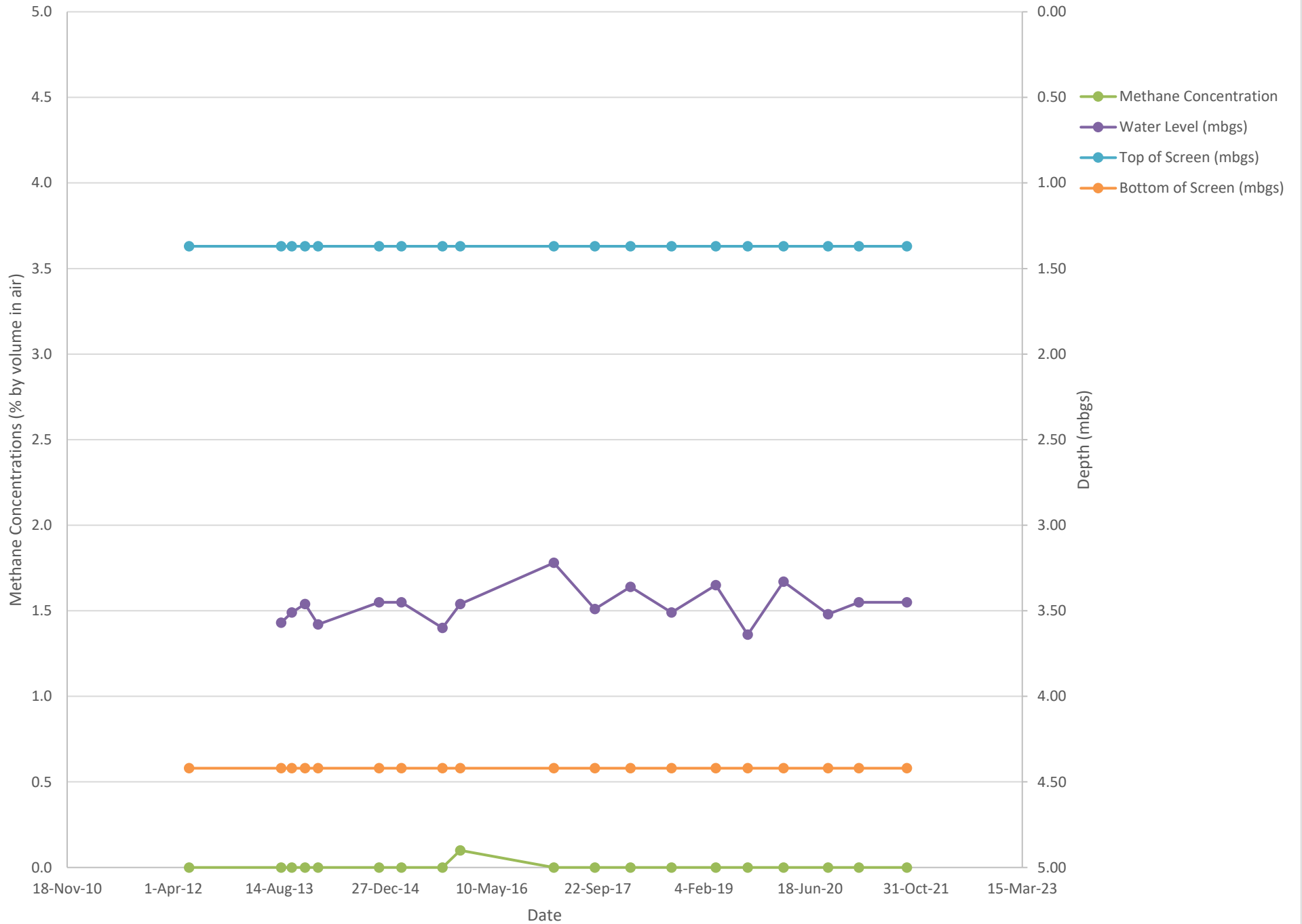
GP-D16



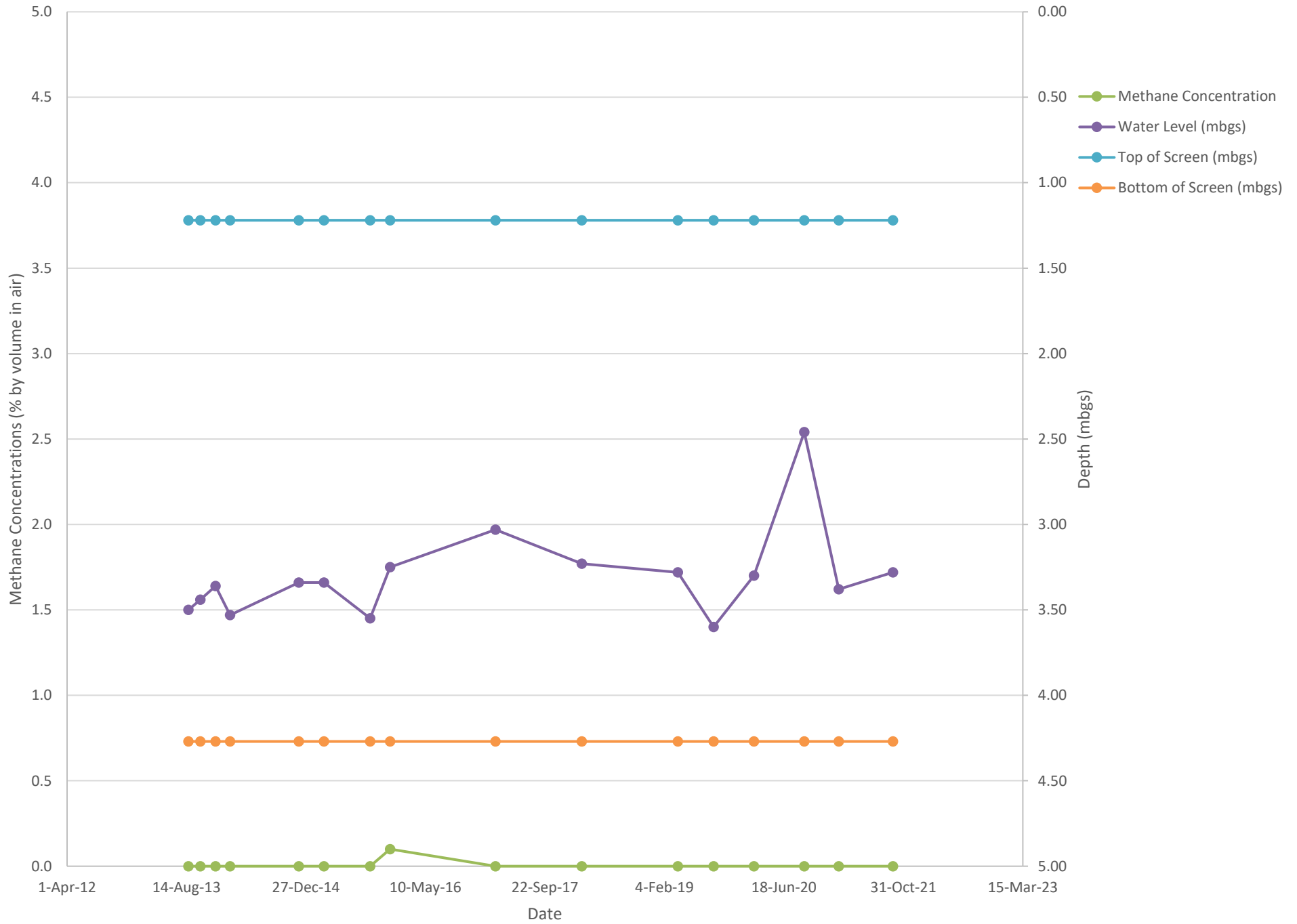
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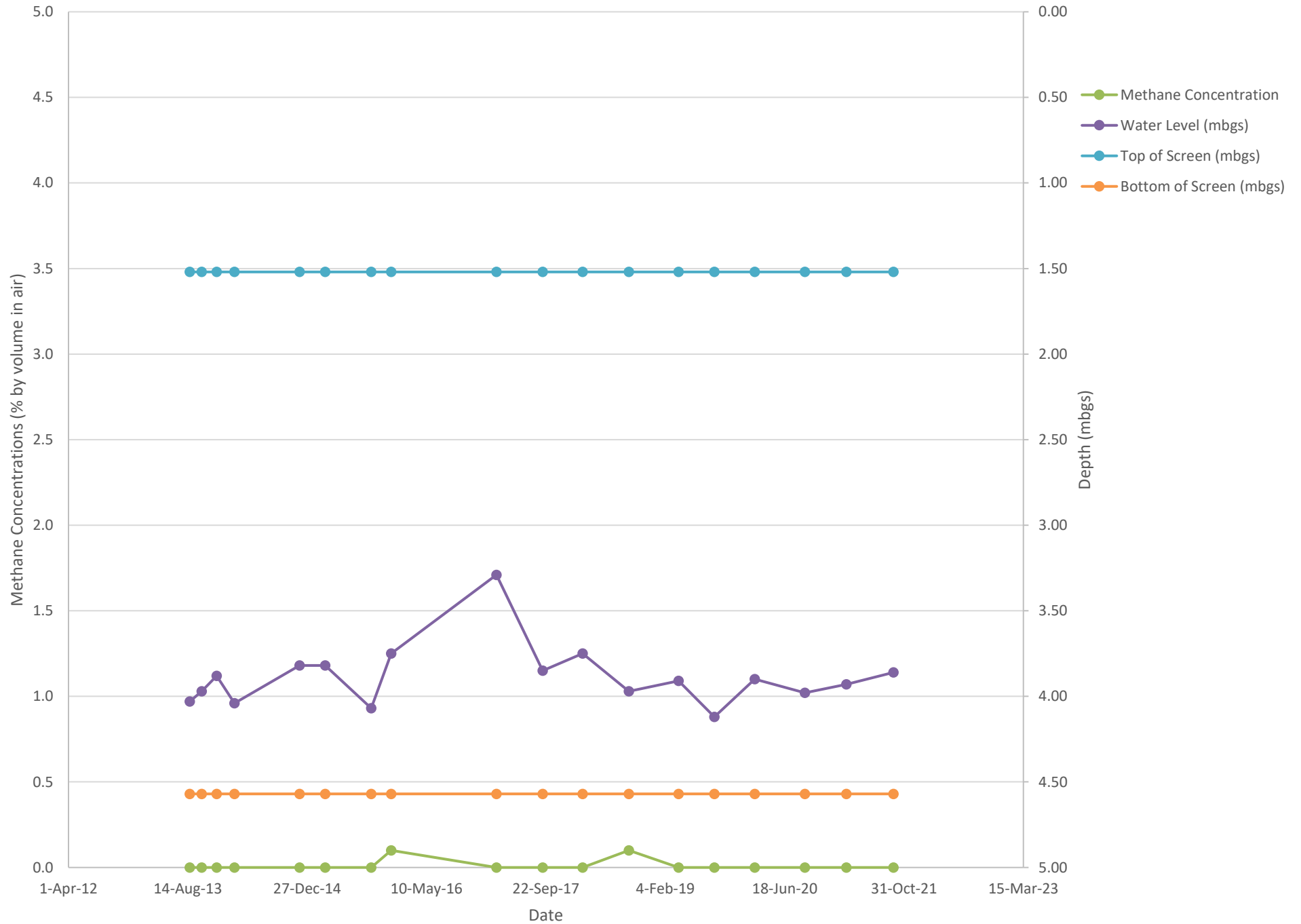
GP-D20



GP-D21



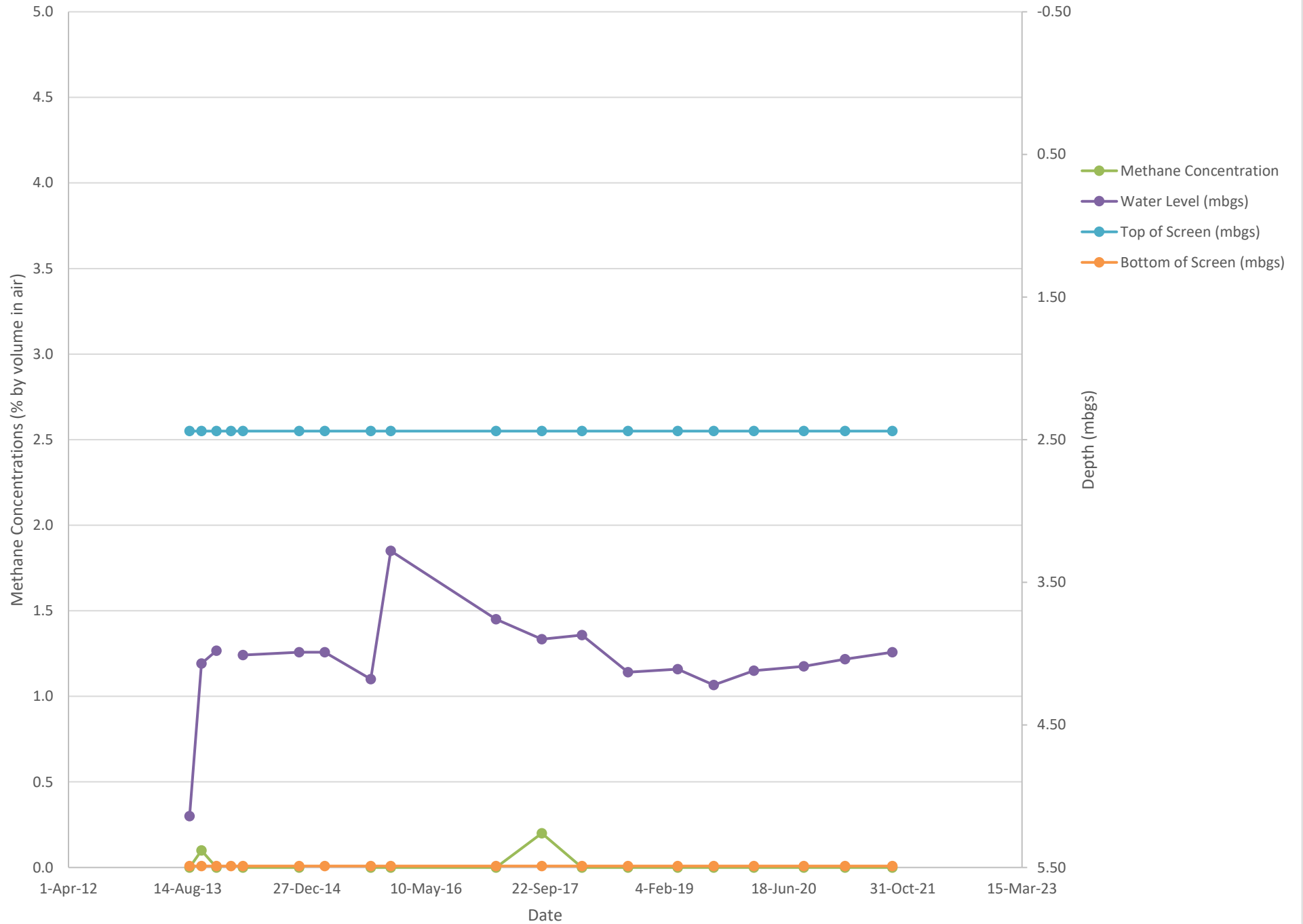
GP-D22



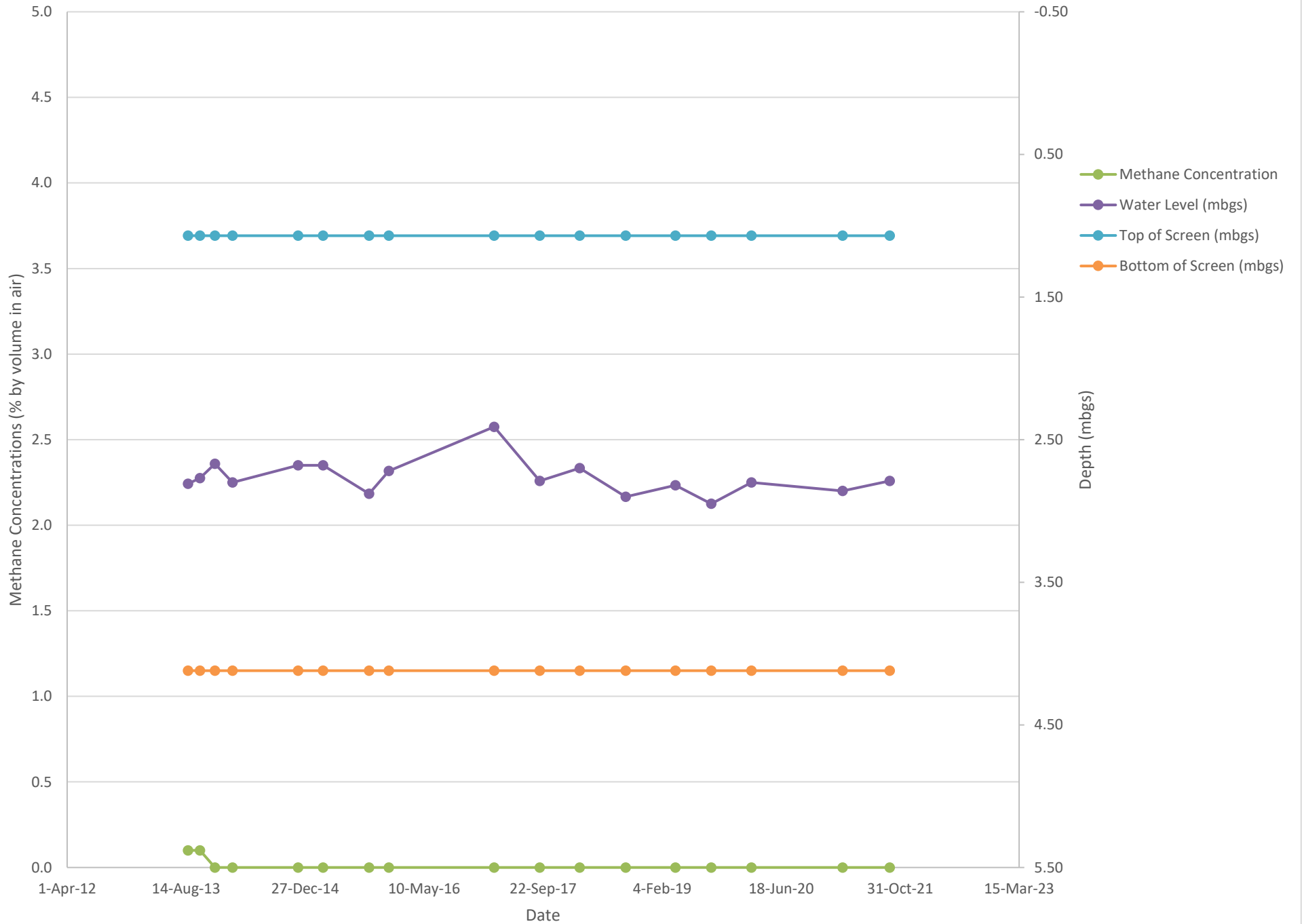
GP-D23



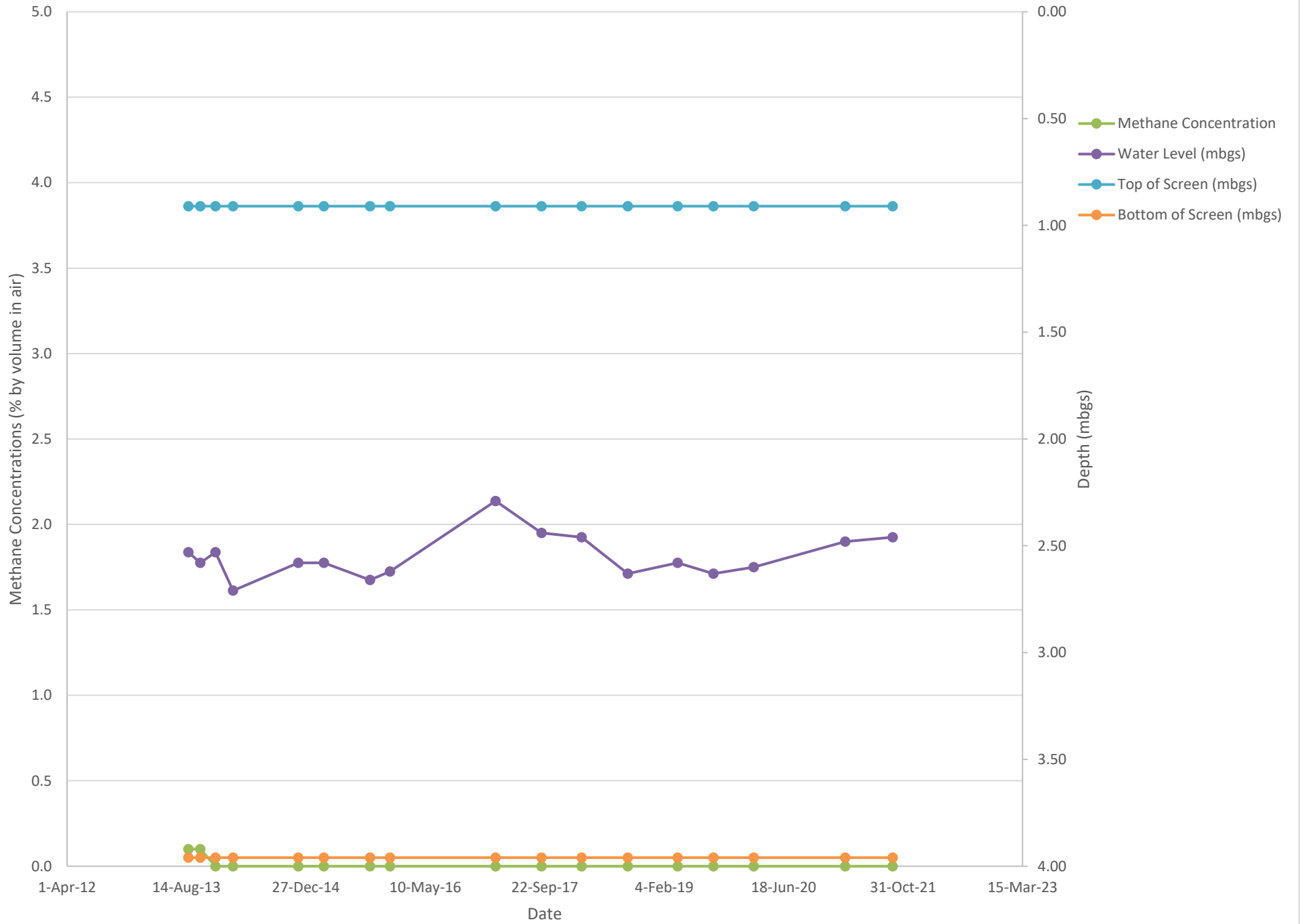
GP-D24



GP-D26



GP-D27



APPENDIX E

ECA Air No. 3118-BD5KTE



GOLDER

Landfill Gas Barrier and Passive Venting System Proposed LFG Monitoring Plan

CITY OF BARRIE HISTORIC WASTE SITE 6

Submitted to:

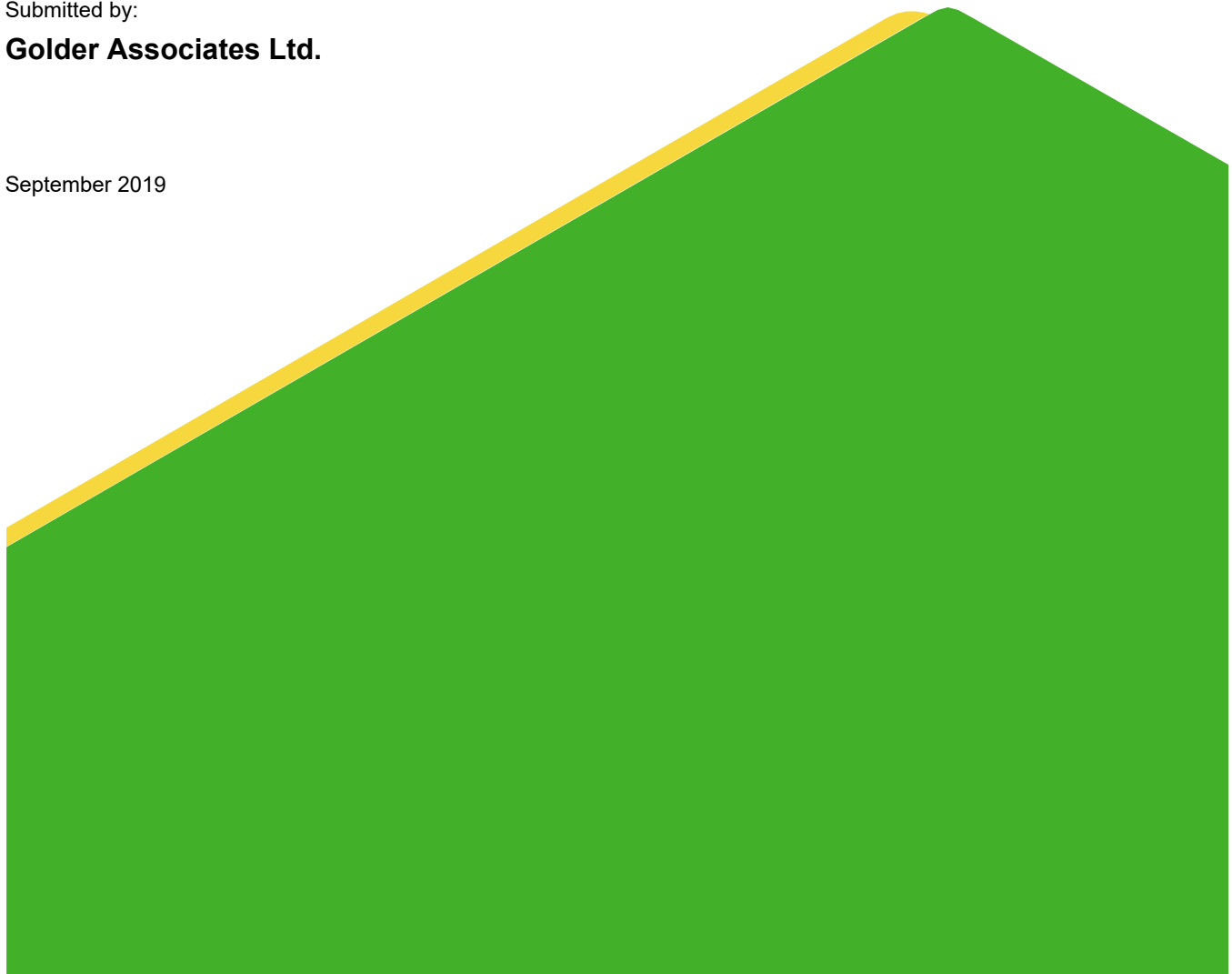
The City of Barrie

70 Collier Street
Barrie, Ontario
L4M 4T5

Submitted by:

Golder Associates Ltd.

September 2019



Distribution List

e-copy – City of Barrie

e-copy – MECP Barrie District Manager

e-copy – Golder Associates Ltd.

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4.0 MONITORING PLAN	2
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4.2 Additional Observations - Wind Speed / Direction and Odours	3
4.3 Reporting.....	3

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FIGURES (Appended)

Figure 1 – Key Plan

Figure 2 – System Layout / Monitoring Locations

APPENDICES

Appendix A – ECA Air

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by the City of Barrie (the City) to prepare a monitoring plan for the Landfill Gas (LFG) Barrier and Passive Venting System at the Historic Waste Site 6 (the Landfill) located on the north side of Dymont's Creek, at the west end of Frederick Street, between Innisfil Street and John Street (Figure 1). Implementation of the Barrier and Passive Venting System was recently approved by the Ministry of Environment, Parks and Climate Change (MECP) through issue of Environmental Compliance Approval for Air (ECA Air) No. 3118-BD5KTE, dated June 14, 2019 (Appendix A). Condition 2.1 of the ECA requires submission of a draft Monitoring Plan for the system not later than six months after the date of the approval.

2.0 BACKGROUND

Starting in 2011, Golder has completed environmental investigations at Historic Waste Site 6. The waste fill area is within the lowland area of Dymont's Creek and is suspected to extend onto residential properties on John Street, Frederick Street and Innisfil Street as shown in Figure 2 (Golder, 2018). These properties include 113 and 115 John Street, 15 and 20 Frederick Street and 134 and 136 Innisfil Street.

The Landfill was operated from approximately 1962 to 1963 and is currently an open space with public access from Frederick Street. There is no ECA for the landfill itself. The need for the landfill gas barrier/venting system relates to recent monitoring carried out by Golder for the Landfill, which identified an elevated risk of subsurface landfill gas migration onto adjacent off-Site private properties (Golder, 2017).

The waste fill thickness ranges from 0.05 m at several locations to a maximum of 4.37 m, and extends to a maximum depth of approximately 8 m below ground surface in the southwest portion of landfill. With the exception of a few areas of the landfill surface, there is a minimum of 1.0 m of soil fill above the top of the waste. For the most part, the waste identified in boreholes consists of non-degradable materials (e.g., glass, plastic, bricks and metal), however, putrescible materials, including animal hides were encountered in a few boreholes. It is noted that in the northwest part of the landfill, the waste material consists largely of inorganic debris.

In 2017, Golder undertook an investigation to assess the risk of LFG migration to adjacent private properties (Golder, 2017). The investigation included monitoring of landfill gas concentrations at a number of gas probes installed along the Landfill boundary. The monitoring indicated elevated (above 5% by volume) methane concentrations along the north and east boundaries. Golder recommended that remediation of landfill gas migration from the landfill be undertaken to limit the City's risk of impacting off-site properties; ultimately a barrier and passive venting system was selected as the most feasible alternative. The Landfill Gas Barrier and Passive Venting System was approved by the MECP through issue of Environmental Compliance Approval for Air (ECA Air) No. 5412-BE7KES, dated June 14, 2019 (Appendix A). Construction is scheduled for the Fall of 2019.

The Landfill Gas Barrier and Passive Venting System will operate 24 hours per day, 365 days per year. The system is passive and therefore there are no sources of noise (e.g. fans/blowers) associated with its operation. Emissions vent passively through turbine ventilators that are powered primarily by the wind.

3.0 LANDFILL GAS BARRIER AND PASSIVE VENTING SYSTEM DESIGN

The proposed landfill gas barrier consists of a 202 m length of interlocking steel sheet piles (Waterloo Barrier™), installed on City land bordering the adjacent private properties on Frederick Street and John Street (Figure 2). The vertical barrier wall will protect against lateral migration of landfill gas via the unsaturated zone onto these private properties.

To collect and vent landfill gas that accumulates along the landfill side of the barrier wall, a shallow 1.2 m deep x 0.75 m wide trench backfilled with processed medium sand (OPSS 1002 – Concrete Sand) and 150 mm nominal diameter perforated tubing is proposed along the full length of the barrier wall. The perforated tubing will connect to a vent pole at three locations adjacent the trench (GVP1 to GVP3), as shown in Figure 2. The vent poles will consist of a 6.0 m high hollow/tapered galvanized steel pole fitted with a 100 mm diameter wind turbine at the top and will be founded on a concrete pier. Each vent pole will have a port covered with a removable steel plate to allow monitoring of landfill gas concentrations.

4.0 MONITORING PLAN

4.1 Field Measurements, Sampling and Laboratory Analysis

The proposed monitoring plan for the LFG barrier/venting system, including requirements for monitoring frequency, field measurements and laboratory analyses is provided in Table 1 below. A semi-annual monitoring frequency is proposed at eleven existing LFG monitoring wells (GP-D1, GP-D2, GP-D3, GP-D8, GPD-13, GPD-14, GP-D20, GP-D21, GP-D22, GP-D23 and GP-D24) and three gas venting poles (GVP1 to GVP3). One of the monitoring rounds should be completed under frozen ground conditions (February/March). These monitoring locations are shown on Figure 2. Monitoring of the landfill gas probes and vent poles is required in order to confirm that the landfill gas barrier/venting system is effective in intercepting and venting lateral migration of landfill gas.

Table 1: LFG Sampling and Monitoring Program

Location	Frequency	Parameters
Gas Probes: GP-D1, GP-D2, GP-D3, GP-D8, GPD-13, GPD-14, GP-D20, GP-D21, GP-D22, GP-D23 and GP-D24	Semi-Annually (one in frozen ground conditions)	Field Measurement: Concentration of methane (% volume and % Lower Explosive Limit (LEL)), carbon dioxide (% volume) and oxygen (% volume) and groundwater level
Vertical Passive Gas Vent System Poles: GVP1, GVP2, GVP3 (sampling port at lower portion of pole)	Semi-Annually (one under frozen ground conditions)	Field Measurement: Concentration of methane (% volume and % Lower Explosive Limit (LEL)), carbon dioxide (% volume) and oxygen (% volume) Flow Rate: Flow rate of landfill gas venting upward within the vent system pole as measured using VelociCalc ventilation meter
	Semi-Annually (one under frozen ground conditions)	Laboratory Analysis: Concentration of methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and volatile organic compounds (collected via Tedlar Bag)

Measurement of the depth to the groundwater level below the top of pipe will be obtained at each gas probe prior to gas sampling and used to calculate the volume of air to be purged prior to sampling. The minimum purging volumes will be three times the volume of air initially present in the monitoring probe. The gas readings will include the concentrations of carbon dioxide (CO₂), methane (CH₄), and oxygen (O₂) recorded using a calibrated Landtec Gas Analyzer and Extraction Monitor (GEM 2000 or GEM 5000).

The methane gas concentration (%LEL and %volume) and gas flow rate will be measured in the field at each gas venting pole. The flow rate will be measured using a VelociCalc ventilation meter. In addition, a sample at each venting pole will be collected in a Tedlar bag and sent to the laboratory for analysis of methane, hydrogen sulphide, oxygen, carbon monoxide, carbon dioxide and volatile organic compounds. Emission rates will be calculated using the maximum measured concentration (ppb or µg/m³) of each contaminant in any of the vents during each sampling round and the average volumetric flow rate (m³/s) to determine an emission rate (g/s).

4.2 Additional Observations - Wind Speed / Direction and Odours

The meteorological data at the time of monitoring, including the wind speed and direction and barometric pressure should be recorded. Meteorological data will be collected from the nearby City of Barrie Landfill Weather Station. This station is located approximately 3 km northwest of the Site, and therefore this weather station is considered to be adequate to represent Site weather conditions during the monitoring events. Should the Barrie Landfill Weather Station be unavailable at the time of monitoring, weather data from the nearby Environment Canada Barrie-Oro Weather Station will be used.

Any landfill gas odours observed at the time of monitoring will also be recorded. If odours are noted, the technician will identify and record the source of the odour.

4.3 Reporting

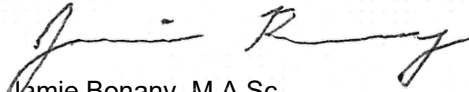
Section 2.2 of the ECA Air requires an annual report to be submitted by March 31 of each year. The annual report for the barrier and passive venting system will be submitted as part of the Annual Monitoring Report for the Dymont's Creek Historic Waste Sites and will include, as a minimum:

- the frequency of monitoring adopted;
- the measured volumetric flow rates of the landfill gas discharging up the vertical vent poles and the concentrations of contaminants in the gas discharging to the atmosphere via the vent poles;
- the wind speeds and wind directions recorded at the time of monitoring; and,
- the results of dispersion calculations, using one of the approved dispersion models listed in Section 6 of O. Reg 419/05, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to air.

We trust that this proposed Monitoring Plan meets your immediate needs. Should you require any additional information or clarification, please do not hesitate to contact the undersigned.

Yours truly,

GOLDER ASSOCIATES LTD.



Jamie Bonany, M.A.Sc.
Project Scientist

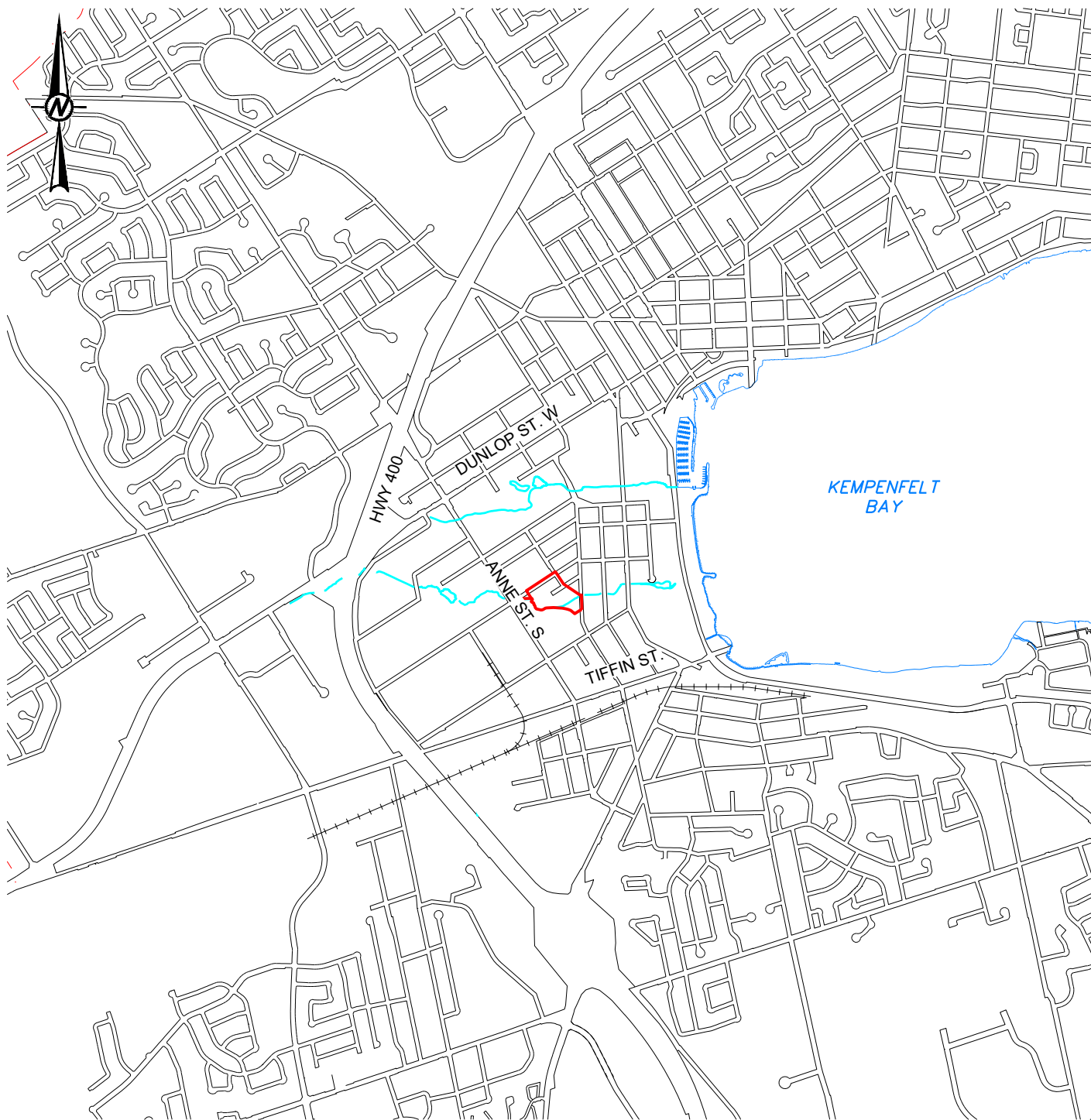


Frank Barone, Ph.D., P.Eng.
Principal, Senior Geo-Environmental Engineer

JEB/FB/cmd

Golder and the G logo are trademarks of Golder Associates Ltd.

FIGURES



LEGEND

— SITE LOCATION

NOTE(S)

1. DATUM IS NAD UTM 83 ZONE 17
2. MAPPING BASED ON COUNTY OF SIMCOE MUNICIPAL BASE



CLIENT
CITY OF BARRIE

PROJECT
SITE 06 HISTORIC LANDFILL
PASSIVE LANDFILL GAS BARRIER / VENTING SYSTEM

CONSULTANT

YYYY-MM-DD 2019-09-18

DESIGNED

PREPARED STB

REVIEWED JEB

APPROVED

TITLE

KEY PLAN

PROJECT NO.
18109243

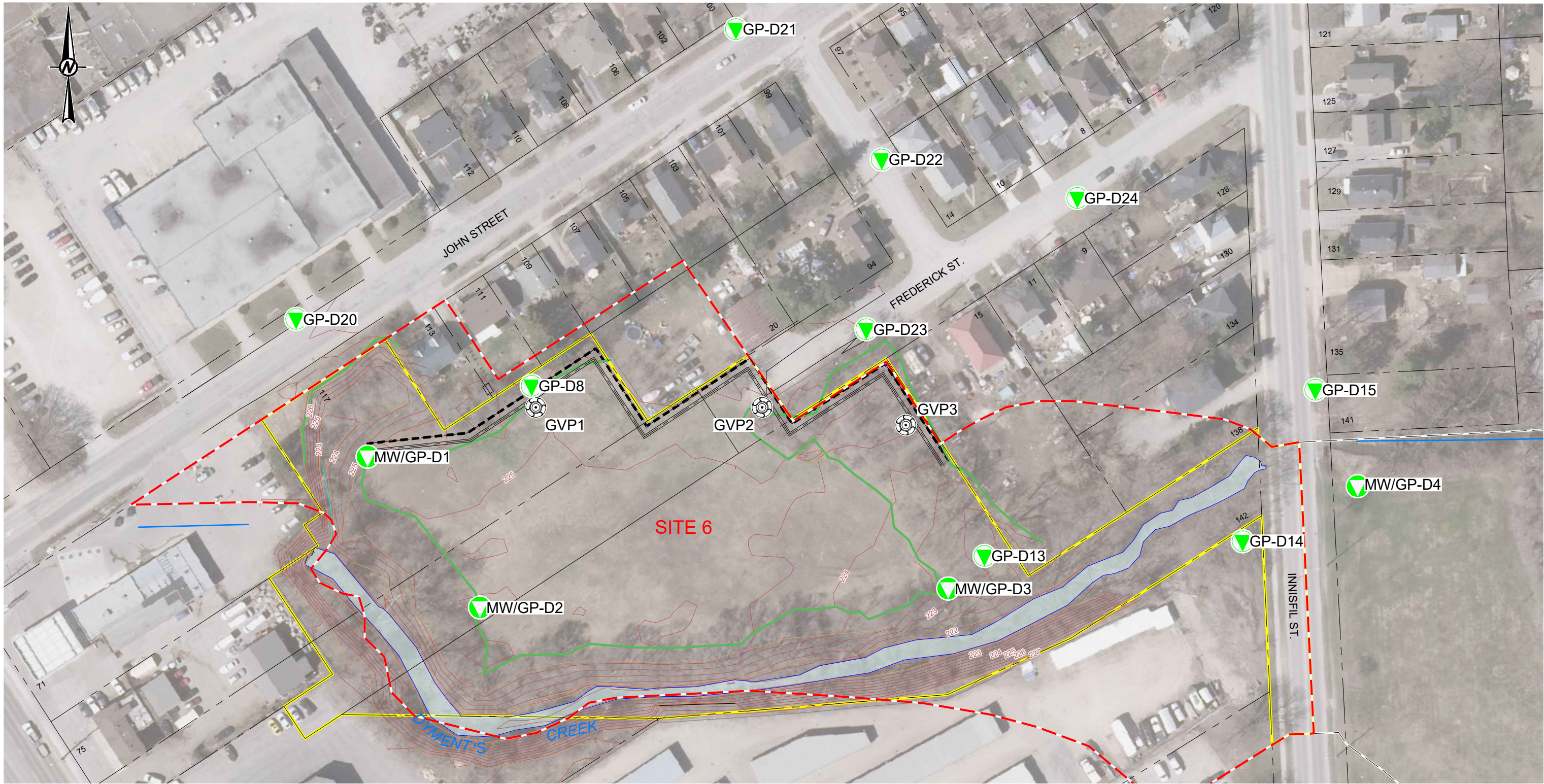
CONTROL
0006

REV.
A

FIGURE
1



Path: \\golder\gas\gas\mss\gas\mss\City_of_Barrie\Site_06_Historic_Landfill\09_PROJ\18109243\0006-Monitoring_Plan | File Name: 18109243-0006-CH-0002.dwg | Last Edited By: Stoverman | Date: 2019-09-18 | Time: 11:52:04 AM



LEGEND

- ESTIMATED WASTE LIMIT
- CITY OF BARRIE OWNED LANDS
- PROPERTY LINE (CITY OF BARRIE PARCEL FABRIC)
- SURVEYED TREE LINE
- PROPOSED ALIGNMENT OF SHEET PILE WALL
- LAYOUT CONTROL POINT ALONG SHEET PILE BARRIER WALL
- PROPOSED GAS VENT TRENCH
- EXISTING GAS PROBE / MONITORING WELL
- PROPOSED GAS VENTING POLE
- EXISTING GROUND SURFACE CONTOURS (SEE REFERENCE 2)



NOTE(S)

- DATUM IS NAD83 ZONE 17
- ALL MAPPED BOUNDARIES, LIMITS, AND INTERPOLATED FEATURES ARE APPROXIMATE
- FIGURE ISSUED FOR ECA AIR APPLICATION

CLIENT
CITY OF BARRIE

CONSULTANT



YYYY-MM-DD 2019-01-04

DESIGNED

PREPARED

STB

REVIEWED

JEB

APPROVED

REFERENCE(S)

- BASE MAP COURTESY CITY OF BARRIE DIGITAL 1:2000 MUNICIPAL MAPPING
- TOPOGRAPHIC SURVEY OF LANDFILL BY SMC GEOMATICS, DECEMBER 2018
- HISTORICAL LANDFILLS ANNUAL MONITORING REPORT, GOLDBER, 2018. 2017 ANNUAL MONITORING PROGRAM - DYMONT'S CREEK HISTORICAL LANDFILLS, JANUARY, 2018
- ORTHOIMAGE FROM DISCOVER SIMCOE, 2016 IMAGERY ACCESSED JANUARY 2019

PROJECT
SITE 06 HISTORIC LANDFILL
PASSIVE LANDFILL GAS BARRIER / VENTING SYSTEM

TITLE
SYSTEM LAYOUT / MONITORING LOCATIONS

PROJECT NO.
18109243

CONTROL
0006

REV.
A

FIGURE
2

25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

APPENDIX A

ECA Air

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3118-BD5KTE
Issue Date: June 14, 2019

The Corporation of the City of Barrie
70 Collier Street
Post Office Box, No. 400
Barrie, Ontario
L4M 4T5

Site Location: Part of Lots 33, 34, 63 to 67, Part of Lots 32, 68 and 69,
Part of Lots 25, 81 to 88, and Part of Lots 77 to 80,
Reference Plan 493
City of Barrie, County of Simcoe

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

- one (1) passive landfill gas venting system, discharging to the air through three (3) passive vents each equipped with wind turbines, and each having an exit diameter of 0.10 metre and extending approximately 6.0 metres above grade;

all in accordance with the Environmental Compliance Approval Application submitted by The Corporation of the City of Barrie, dated February 11, 2019 and signed by Sandra Brunet, Manager; and the supporting information including the Emission Summary and Dispersion Modelling Report, submitted by Golder Associates Ltd., dated February 13, 2019 and signed by Katherine Armstrong; and e-mails dated June 3 and June 6, 2019 from Katherine Armstrong of Golder Associates Ltd.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Annual Report" means a report containing the results of the *Monitoring Plan* implementation for the preceding year;
2. "Approval" means this Environmental Compliance Approval, including the application and supporting documentation listed above;

3. "*Company*" means The Corporation of the City of Barrie, that is responsible for the construction or operation of the *Facility* and includes any successors and assigns;
4. "*Director*" means a person appointed for the purpose of section 20.3 of the *EPA* by the *Minister* pursuant to section 5 of the *EPA*;
5. "*District Manager*" means the District Manager of the appropriate local district office of the *Ministry* where the *Facility* is geographically located;
6. "*EPA*" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;
7. "*Equipment*" means the equipment and processes described in the *Company*'s application, this *Approval* and in the supporting documentation submitted with the application, to the extent approved by this *Approval*;
8. "*Facility*" means the entire operation located on the property where the *Equipment* is located;
9. "*Manual*" means a document or a set of documents that provide written instructions to staff of the *Company*;
10. "*Monitoring Plan*" means a written plan developed to monitor the landfill gas collected and discharged from the *Equipment* at the site;
11. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and includes all officials, employees or other persons acting on its behalf;
12. "*Publication NPC-300*" means the *Ministry* Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. OPERATION AND MAINTENANCE

1. The *Company* shall ensure that the *Equipment* is properly operated and maintained at all times. The *Company* shall:
 - a. prepare, not later than three (3) months after the date of this *Approval*, and update, as necessary, a *Manual* outlining the operating procedures and a maintenance program for the *Equipment*, including:

- i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the *Equipment* suppliers;
 - ii. emergency procedures;
 - iii. procedures for any record keeping activities relating to operation and maintenance of the *Equipment*; and
 - iv. all appropriate measures to minimize noise and odorous emissions from all potential sources;
- b. implement the recommendations of the *Manual*.

2. MONITORING AND REPORTING

1. The *Company* shall submit to the *District Manager*, not later than one (1) month prior to the commencement of operations at the site, a draft *Monitoring Plan* for the gas collected and discharged from the *Equipment*. The *Company* shall finalize the *Monitoring Plan* in consultation with the *District Manager*. The finalized *Monitoring Plan* shall be implemented upon commencement of operations at the site and include, as a minimum, the following:
 - a. the frequency of monitoring agreed upon by the *District Manager*;
 - b. a methodology to measure the concentrations of contaminants in the gas discharging to the air; and
 - c. procedures to measure and record the wind speed and wind direction at the location where the *Equipment* is installed, at times of monitoring.
2. The *Company* shall submit, not later than **March 31, 2021** and each subsequent year thereafter, to the *District Manager* an *Annual Report* on the results of the *Monitoring Plan* implementation for the preceding year. Each *Annual Report* shall include, as a minimum, the following:
 - a. the frequency of monitoring adopted;
 - b. the concentrations of contaminants in the gas discharging to the air;
 - c. the wind speeds and wind directions recorded at the times of monitoring; and
 - d. the results of dispersion calculations, using one of the approved dispersion models listed in section 6 of O. Reg. 419/05 applicable to the *Facility*, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to the air using the results of monitoring.
3. The *Company*, upon submission of the third *Annual Report*, with approval from the *District Manager*, may amend the monitoring and reporting requirements of this *Approval*.

3. RECORD RETENTION

1. The *Company* shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this *Approval*, and make these records available for review by staff of the *Ministry* upon request. The *Company* shall retain:
 - a. all records on the maintenance, repair and inspection of the *Equipment*; and
 - b. all records of any environmental complaints, including:
 - i. a description, time and date of each incident to which the complaint relates;
 - ii. wind direction at the time of the incident to which the complaint relates; and
 - iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

4. NOTIFICATION OF COMPLAINTS

1. The *Company* shall notify the *District Manager*, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:
 - a. a description of the nature of the complaint; and
 - b. the time and date of the incident to which the complaint relates.

5. NOISE

1. The *Company* shall, at all times, ensure that the noise emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-300*.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to emphasize that the *Equipment* must be maintained and operated according to a procedure that will result in compliance with the *EPA*, the Regulations and this *Approval*.
2. Condition No. 2 is included to require the *Company* to gather accurate information so that compliance with the *EPA*, the regulations and this *Approval* can be verified.
3. Condition No. 3 is included to require the *Company* to keep records and to provide information to staff of the *Ministry* so that compliance with the *EPA*, the Regulations and this *Approval* can be verified.
4. Condition No. 4 is included to require the *Company* to notify staff of the *Ministry* so as to assist the *Ministry* with the review of the site's compliance.

5. Condition No. 5 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the *Facility*.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

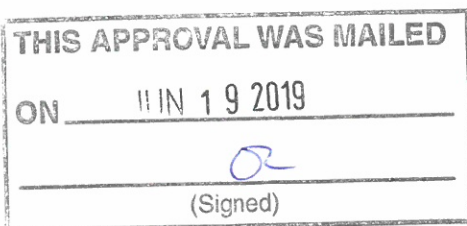
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of June, 2019



Jeffrey McKerrall, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

BR/

c: District Manager, MECP Barrie

Katherine Armstrong, Golder Associates Ltd.



golder.com

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3118-BD5KTE
Issue Date: June 14, 2019

The Corporation of the City of Barrie
70 Collier Street
Post Office Box, No. 400
Barrie, Ontario
L4M 4T5

Site Location: Part of Lots 33, 34, 63 to 67, Part of Lots 32, 68 and 69,
Part of Lots 25, 81 to 88, and Part of Lots 77 to 80,
Reference Plan 493
City of Barrie, County of Simcoe

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all in accordance with the Environmental Compliance Approval Application submitted by The Corporation of the City of Barrie, dated February 11, 2019 and signed by Sandra Brunet, Manager; and the supporting information including the Emission Summary and Dispersion Modelling Report, submitted by Golder Associates Ltd., dated February 13, 2019 and signed by Katherine Armstrong; and e-mails dated June 3 and June 6, 2019 from Katherine Armstrong of Golder Associates Ltd.

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7. "*Equipment*" means the equipment and processes described in the *Company*'s application, this *Approval* and in the supporting documentation submitted with the application, to the extent approved by this *Approval*;
8. "*Facility*" means the entire operation located on the property where the *Equipment* is located;
9. "*Manual*" means a document or a set of documents that provide written instructions to staff of the *Company*;
10. "*Monitoring Plan*" means a written plan developed to monitor the landfill gas collected and discharged from the *Equipment* at the site;
11. "*Ministry*" means the ministry of the government of Ontario responsible for the *EPA* and includes all officials, employees or other persons acting on its behalf;
12. "*Publication NPC-300*" means the *Ministry* Publication NPC-300, "Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning, Publication NPC-300", August 2013, as amended.

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 - a. prepare, not later than three (3) months after the date of this *Approval*, and update, as necessary, a *Manual* outlining the operating procedures and a maintenance program for the *Equipment*, including:

- i. routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the *Equipment* suppliers;
 - ii. emergency procedures;
 - iii. procedures for any record keeping activities relating to operation and maintenance of the *Equipment*; and
 - iv. all appropriate measures to minimize noise and odorous emissions from all potential sources;
- b. implement the recommendations of the *Manual*.

2. MONITORING AND REPORTING

1. The *Company* shall submit to the *District Manager*, not later than one (1) month prior to the commencement of operations at the site, a draft *Monitoring Plan* for the gas collected and discharged from the *Equipment*. The *Company* shall finalize the *Monitoring Plan* in consultation with the *District Manager*. The finalized *Monitoring Plan* shall be implemented upon commencement of operations at the site and include, as a minimum, the following:
 - a. the frequency of monitoring agreed upon by the *District Manager*;
 - b. a methodology to measure the concentrations of contaminants in the gas discharging to the air; and
 - c. procedures to measure and record the wind speed and wind direction at the location where the *Equipment* is installed, at times of monitoring.
2. The *Company* shall submit, not later than **March 31, 2021** and each subsequent year thereafter, to the *District Manager* an *Annual Report* on the results of the *Monitoring Plan* implementation for the preceding year. Each *Annual Report* shall include, as a minimum, the following:
 - a. the frequency of monitoring adopted;
 - b. the concentrations of contaminants in the gas discharging to the air;
 - c. the wind speeds and wind directions recorded at the times of monitoring; and
 - d. the results of dispersion calculations, using one of the approved dispersion models listed in section 6 of O. Reg. 419/05 applicable to the *Facility*, indicating the maximum point of impingement concentrations of contaminants in the gas discharging to the air using the results of monitoring.
3. The *Company*, upon submission of the third *Annual Report*, with approval from the *District Manager*, may amend the monitoring and reporting requirements of this *Approval*.

3. RECORD RETENTION

1. The *Company* shall retain, for a minimum of two (2) years from the date of their creation, all records and information related to or resulting from the recording activities required by this *Approval*, and make these records available for review by staff of the *Ministry* upon request. The *Company* shall retain:
 - a. all records on the maintenance, repair and inspection of the *Equipment*; and
 - b. all records of any environmental complaints, including:
 - i. a description, time and date of each incident to which the complaint relates;
 - ii. wind direction at the time of the incident to which the complaint relates; and
 - iii. a description of the measures taken to address the cause of the incident to which the complaint relates and to prevent a similar occurrence in the future.

4. NOTIFICATION OF COMPLAINTS

1. The *Company* shall notify the *District Manager*, in writing, of each environmental complaint within two (2) business days of the complaint. The notification shall include:
 - a. a description of the nature of the complaint; and
 - b. the time and date of the incident to which the complaint relates.

5. NOISE

1. The *Company* shall, at all times, ensure that the noise emissions from the *Facility* comply with the limits set out in *Ministry Publication NPC-300*.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition No. 1 is included to emphasize that the *Equipment* must be maintained and operated according to a procedure that will result in compliance with the *EPA*, the Regulations and this *Approval*.
2. Condition No. 2 is included to require the *Company* to gather accurate information so that compliance with the *EPA*, the regulations and this *Approval* can be verified.
3. Condition No. 3 is included to require the *Company* to keep records and to provide information to staff of the *Ministry* so that compliance with the *EPA*, the Regulations and this *Approval* can be verified.
4. Condition No. 4 is included to require the *Company* to notify staff of the *Ministry* so as to assist the *Ministry* with the review of the site's compliance.

5. Condition No. 5 is included to provide the minimum performance requirements considered necessary to prevent an adverse effect resulting from the operation of the *Facility*.

In accordance with Section 139 of the Environmental Protection Act, you may by written Notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 142 of the Environmental Protection Act provides that the Notice requiring the hearing shall state:

- a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
- b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5

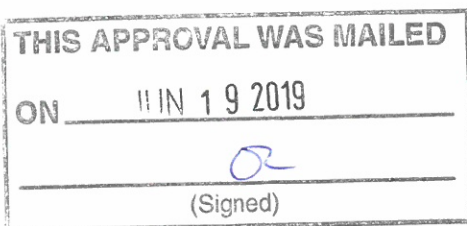
AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca

The above noted activity is approved under s.20.3 of Part II.1 of the Environmental Protection Act.

DATED AT TORONTO this 14th day of June, 2019



Jeffrey McKerrall, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

BR/

c: District Manager, MECP Barrie

Katherine Armstrong, Golder Associates Ltd.

APPENDIX F

Site 6 Passive Venting System Monitoring and Results

Table F1
Summary of the Landfill Gas Chemistry Results

Calculated Parameters	Location	GVP1	GVP2	GVP3	GVP1	GVP2	GVP3
	Units/Date	04-Feb-21			06-Dec-21		
Dichlorodifluoromethane	ug/m3	27.1	8.1	2.5	5.6	873	47.8
1,2-Dichlorotetrafluoroethane	ug/m3	261.0	45.8	2.8	4.5	<29	<1.2
Chloromethane	ug/m3	<1.2	<1.2	<1.2	<1.2	<1.2	0.97
Vinyl Chloride	ug/m3	<0.51	<0.51	<0.51	<0.51	<0.51	<0.26
Chloroethane	ug/m3	<1.6	<1.6	<1.6	<1.6	<1.6	<0.79
1,3-Butadiene	ug/m3	<2.2	<2.2	<2.2	<2.2	<2.2	<1.1
Trichlorofluoromethane (FREON 11)	ug/m3	2.7	3.4	<2.2	<2.2	<2.2	1.5
Ethanol (ethyl alcohol)	ug/m3	337.0	218.0	159.0	272	113	165
Trichlorotrifluoroethane	ug/m3	<2.3	<2.3	<2.3	<2.3	<2.3	<1.2
2-propanol	ug/m3	35.5	30.4	28.0	89.2	32.1	15.7
2-Propanone	ug/m3	15.8	20.7	14.9	11.8	9.3	15.4
Methyl Ethyl Ketone (2-Butanone)	ug/m3	<1.2	1.9	1.4	1.7	1.8	2.21
Methyl Isobutyl Ketone	ug/m3	<1.6	<1.6	<1.6	<1.6	<1.6	<0.82
Methyl Butyl Ketone (2-Hexanone)	ug/m3	<8.2	<8.2	<8.2	<8.2	<8.2	<4.1
Methyl t-butyl ether (MTBE)	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.72
Ethyl Acetate	ug/m3	33.6	27.1	17.4	8.3	<7.2	45.3
1,1-Dichloroethylene	ug/m3	<0.79	<0.79	<0.79	<0.79	<0.79	<0.40
cis-1,2-Dichloroethylene	ug/m3	<0.79	<0.79	<0.79	<0.79	<0.79	<0.40
trans-1,2-Dichloroethylene	ug/m3	<0.79	<0.79	<0.79	<0.79	<0.79	<0.40
Methylene Chloride(Dichloromethane)	ug/m3	<4.2	<4.2	<4.2	<4.2	<4.2	2.2
Chloroform	ug/m3	4.0	6.2	5.1	<0.98	<0.98	0.76
Carbon Tetrachloride	ug/m3	<1.3	<1.3	<1.3	<1.3	<1.3	<0.63
1,1-Dichloroethane	ug/m3	<0.81	<0.81	<0.81	<0.81	<0.81	<0.40
1,2-Dichloroethane	ug/m3	<0.81	<0.81	<0.81	<0.81	<0.81	<0.40
Ethylene Dibromide	ug/m3	<1.5	<1.5	<1.5	<1.5	<1.5	<0.77
1,1,1-Trichloroethane	ug/m3	<1.1	<1.1	<1.1	<1.1	<1.1	<0.55
1,1,2-Trichloroethane	ug/m3	<1.1	<1.1	<1.1	<1.1	<1.1	<0.55
1,1,2,2-Tetrachloroethane	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69
cis-1,3-Dichloropropene	ug/m3	<0.91	<0.91	<0.91	<0.91	<0.91	<0.45
trans-1,3-Dichloropropene	ug/m3	<0.91	<0.91	<0.91	<0.91	<0.91	<0.45
1,2-Dichloropropane	ug/m3	<0.92	<0.92	<0.92	<0.92	<0.92	<0.46
Bromomethane	ug/m3	<0.78	<0.78	<0.78	<0.78	<0.78	<0.39
Bromoform	ug/m3	<4.1	<4.1	<4.1	<4.1	<4.1	<2.1
Bromodichloromethane	ug/m3	<2.7	<2.7	<2.7	<2.7	<2.7	<1.3
Dibromochloromethane	ug/m3	<3.4	<3.4	<3.4	<3.4	<3.4	<1.7
Trichloroethylene	ug/m3	<1.1	1.6	<1.1	<1.1	<1.1	<0.54
Tetrachloroethylene	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.68
Benzene	ug/m3	0.8	<0.64	<0.64	0.69	<0.64	1.83
Toluene	ug/m3	9.7	6.7	5.0	3.73	4.25	27.6
Ethylbenzene	ug/m3	1.1	<0.87	0.9	<0.87	<0.87	2.38
p+m-Xylene	ug/m3	3.0	2.1	2.1	<1.7	<1.7	9.67
o-Xylene	ug/m3	1.2	<0.87	<0.87	<0.87	<0.87	3.34
Styrene	ug/m3	2.1	1.2	1.0	<0.85	<0.85	0.90
4-ethyltoluene	ug/m3	<4.9	<4.9	<4.9	<4.9	<4.9	<2.5
1,3,5-Trimethylbenzene	ug/m3	<4.9	<4.9	<4.9	<4.9	<4.9	<2.5
1,2,4-Trimethylbenzene	ug/m3	<4.9	<4.9	<4.9	<4.9	<4.9	5.9
Chlorobenzene	ug/m3	<0.92	<0.92	<0.92	<0.92	<0.92	<0.46
Benzyl chloride	ug/m3	<5.2	<5.2	<5.2	<5.2	<5.2	<2.6
1,3-Dichlorobenzene	ug/m3	<4.8	<4.8	<4.8	<4.8	<4.8	<2.4
1,4-Dichlorobenzene	ug/m3	<1.2	<1.2	<1.2	<1.2	<1.2	<0.60
1,2-Dichlorobenzene	ug/m3	<1.2	2.2	<1.2	<1.2	<1.2	<0.60
1,2,4-Trichlorobenzene	ug/m3	<7.4	<7.4	<7.4	<7.4	<7.4	<3.7
Hexachlorobutadiene	ug/m3	<11	<11	<11	<11	<11	<5.3
Hexane	ug/m3	<1.4	<1.4	<1.4	2.0	1.8	1.42
Heptane	ug/m3	4.6	3.9	<2.5	<2.5	<2.5	2.0
Cyclohexane	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69
Tetrahydrofuran	ug/m3	<2.4	<2.4	<2.4	<2.4	<2.4	<1.2

Table F1
Summary of the Landfill Gas Chemistry Results

Calculated Parameters	Location	GVP1	GVP2	GVP3	GVP1	GVP2	GVP3
	Units/Date	04-Feb-21			06-Dec-21		
1,4-Dioxane	ug/m3	<7.2	<7.2	<7.2	<7.2	<7.2	<3.6
Naphthalene	ug/m3	2.8	5.3	<2.1	<2.1	<2.1	1.5
Total Xylenes	ug/m3	4.2	<2.6	<2.6	<2.6	<2.6	13.0
1,1,1,2-Tetrachloroethane	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.69
Vinyl Bromide	ug/m3	<1.8	<1.8	<1.8	<1.8	<1.8	<0.87
Propene	ug/m3	<6.4	<4.3	<2.6	<3.6	<4.3	<1.4
2,2,4-Trimethylpentane	ug/m3	<1.9	<1.9	<1.9	<1.9	<1.9	1.08
Carbon Disulfide	ug/m3	<3.1	5.9	4.3	<3.1	<3.1	7.7
Vinyl Acetate	ug/m3	<1.4	<1.4	<1.4	<1.4	<1.4	<0.70
Matrix Gases							
Methane	% v/v	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hydrogen sulfide	ppm	<0.7	<0.7	<0.7	<0.6	<0.6	<0.6
Oxygen	% v/v	18.4	20.0	21.8	21.1	20.8	21.1
Carbon Monoxide	% v/v	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carbon Dioxide	% v/v	2.7	1.5	<0.1	0.1	0.3	<0.1

Notes:

< Indicates parameter was below laboratory equipment detection limit.

ug/m3 - micrograms per cubic metre

%v/v - volume percent

ppmv - parts per million by volume

Table F2
Sources and Contaminants Identification Table

Source Information			Expected Contaminants	Significant (Yes or No)?	Modelled (Yes or No)?	Rationale
Source ID	Source Description or Title	General Location				
P1, P4, P6	LFG Collection System Vent	Site	Landfill Gas Constituents	Yes	Yes	N/A

Table F3
Source Summary Table

Source Identifier	Source Description	Stack ID	Emission Data						
			Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
P1	LFG Collection System Vent	STCK1	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
			Carbon dioxide	124-38-9	4.05E-05	1,24, Annual	ST	Average	63%
			Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
			Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
			Dichlorodifluoromethane	75-71-8	2.26E-10	1,24, Annual	ST	Average	3%
			1,2-Dichlorotetrafluoroethane	76-14-2	2.18E-09	1,24, Annual	ST	Average	84%
			Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
			Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
			Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
			1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
			Trichlorofluoromethane	75-69-4	2.25E-11	1,24, Annual	ST	Average	33%
			Ethanol	64-17-5	2.81E-09	1,24, Annual	ST	Average	47%
			Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
			2-propanol	67-63-0	7.43E-10	1,24, Annual	ST	Average	60%
			2-Propanone	67-64-1	1.32E-10	1,24, Annual	ST	Average	30%
			Methyl Ethyl Ketone	78-93-3	1.42E-11	1,24, Annual	ST	Average	29%
			Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
			Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
			Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
			Ethyl Acetate	141-78-6	2.80E-10	1,24, Annual	ST	Average	32%
			1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
			cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
			trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
			Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
			Chloroform	67-66-3	3.31E-11	1,24, Annual	ST	Average	26%
			Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
			1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
			Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
			1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
			cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
			trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
			Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
			Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
			Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
			Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
			Trichloroethylene	79-01-6	9.17E-12	1,24, Annual	ST	Average	29%
			Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
			Benzene	71-43-2	6.25E-12	1,24, Annual	ST	Average	23%
			Toluene	108-88-3	8.08E-11	1,24, Annual	ST	Average	22%
			Ethylbenzene	100-41-4	9.00E-12	1,24, Annual	ST	Average	25%
			p+m-Xylene	106-42-3	2.50E-11	1,24, Annual	ST	Average	20%
			o-Xylene	95-47-6	9.83E-12	1,24, Annual	ST	Average	22%
			Styrene	100-42-5	1.74E-11	1,24, Annual	ST	Average	49%
			4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,2,4-Trimethylbenzene	95-63-6	4.08E-11	1,24, Annual	ST	Average	31%
			Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%
			Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
			1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
			1,2-Dichlorobenzene	95-50-1	1.00E-11	1,24, Annual	ST	Average	26%
			1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
			Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
			Hexane	110-54-3	1.67E-11	1,24, Annual	ST	Average	38%
			Heptane	142-82-5	3.83E-11	1,24, Annual	ST	Average	42%
			Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
			Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
			Naphthalene	91-20-3	2.33E-11	1,24, Annual	ST	Average	27%
			Total Xylenes	1330-20-7	3.50E-11	1,24, Annual	ST	Average	21%
			1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
			Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
			Propene	115-07-1	5.33E-11	1,24, Annual	ST	Average	48%
			2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
			Carbon Disulfide	75-15-0	2.58E-11	1,24, Annual	ST	Average	19%
			Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%
P4	LFG Collection System Vent	STCK2	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
			Carbon dioxide	124-38-9	2.25E-05	1,24, Annual	ST	Average	35%
			Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
			Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
			Dichlorodifluoromethane	75-71-8	7.28E-09	1,24, Annual	ST	Average	92%
			1,2-Dichlorotetrafluoroethane	76-14-2	3.82E-10	1,24, Annual	ST	Average	15%
			Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
			Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
			Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
			1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
			Trichlorofluoromethane	75-69-4	2.83E-11	1,24, Annual	ST	Average	41%
			Ethanol	64-17-5	1.82E-09	1,24, Annual	ST	Average	30%
			Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
			2-propanol	67-63-0	2.68E-10	1,24, Annual	ST	Average	22%
			2-Propanone	67-64-1	1.73E-10	1,24, Annual	ST	Average	40%
			Methyl Ethyl Ketone	78-93-3	1.58E-11	1,24, Annual	ST	Average	33%
			Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
			Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
			Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
			Ethyl Acetate	141-78-6	2.26E-10	1,24, Annual	ST	Average	26%
			1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
			cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
			trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
			Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
			Chloroform	67-66-3	5.14E-11	1,24, Annual	ST	Average	41%
			Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
			1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
			Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
			1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
			cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
			trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
			Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
			Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
			Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
			Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
			Trichloroethylene	79-01-6	1.33E-11	1,24, Annual	ST	Average	42%
			Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
			Benzene	71-43-2	5.33E-12	1,24, Annual	ST	Average	20%
			Toluene	108-88-3	5.62E-11	1,24, Annual	ST	Average	15%
			Ethylbenzene	100-41-4	7.25E-12	1,24, Annual	ST	Average	20%
			p+m-Xylene	106-42-3	1.75E-11	1,24, Annual	ST	Average	14%
			o-Xylene	95-47-6	7.25E-12	1,24, Annual	ST	Average	16%
			Styrene	100-42-5	9.67E-12	1,24, Annual	ST	Average	27%
			4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,2,4-Trimethylbenzene	95-63-6	4.08E-11	1,24, Annual	ST	Average	31%
			Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%

Table F3
Source Summary Table

Source Identifier	Source Description	Stack ID	Emission Data						
			Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
p4	LFG Collection System Vent	STCK2	Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
			1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
			1,2-Dichlorobenzene	95-50-1	1.83E-11	1,24, Annual	ST	Average	48%
			1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
			Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
			Hexane	110-54-3	1.50E-11	1,24, Annual	ST	Average	34%
			Heptane	142-82-5	3.25E-11	1,24, Annual	ST	Average	35%
			Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
			Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
			Naphthalene	91-20-3	4.42E-11	1,24, Annual	ST	Average	52%
			Total Xylenes	1330-20-7	2.17E-11	1,24, Annual	ST	Average	13%
			1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
			Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
			Propene	115-07-1	3.58E-11	1,24, Annual	ST	Average	32%
			2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
			Carbon Disulfide	75-15-0	4.92E-11	1,24, Annual	ST	Average	35%
			Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%
p6	LFG Collection System Vent	STCK3	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
			Carbon dioxide	124-38-9	1.50E-06	1,24, Annual	ST	Average	2%
			Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
			Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
			Dichlorodifluoromethane	75-71-8	3.98E-10	1,24, Annual	ST	Average	5%
			1,2-Dichlorotetrafluoroethane	76-14-2	2.33E-11	1,24, Annual	ST	Average	<1%
			Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
			Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
			Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
			1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
			Trichlorofluoromethane	75-69-4	1.83E-11	1,24, Annual	ST	Average	27%
			Ethanol	64-17-5	1.38E-09	1,24, Annual	ST	Average	23%
			Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
			2-propanol	67-63-0	2.33E-10	1,24, Annual	ST	Average	19%
			2-Propanone	67-64-1	1.28E-10	1,24, Annual	ST	Average	30%
			Methyl Ethyl Ketone	78-93-3	1.84E-11	1,24, Annual	ST	Average	38%
			Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
			Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
			Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
			Ethyl Acetate	141-78-6	3.78E-10	1,24, Annual	ST	Average	43%
			1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
			cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
			trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
			Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
			Chloroform	67-66-3	4.24E-11	1,24, Annual	ST	Average	33%
			Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
			1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
			Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
			1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
			1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
			cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
			trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
			1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
			Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
			Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
			Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
			Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
			Trichloroethylene	79-01-6	9.17E-12	1,24, Annual	ST	Average	29%
			Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
			Benzene	71-43-2	1.53E-11	1,24, Annual	ST	Average	57%
			Toluene	108-88-3	2.30E-10	1,24, Annual	ST	Average	63%
			Ethylbenzene	100-41-4	1.98E-11	1,24, Annual	ST	Average	55%
			p+m-Xylene	106-42-3	8.06E-11	1,24, Annual	ST	Average	65%
			o-Xylene	95-47-6	2.78E-11	1,24, Annual	ST	Average	62%
			Styrene	100-42-5	8.50E-12	1,24, Annual	ST	Average	24%
			4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
			1,2,4-Trimethylbenzene	95-63-6	4.92E-11	1,24, Annual	ST	Average	38%
			Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%
			Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
			1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
			1,2-Dichlorobenzene	95-50-1	1.00E-11	1,24, Annual	ST	Average	26%
			1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
			Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
			Hexane	110-54-3	1.18E-11	1,24, Annual	ST	Average	27%
			Heptane	142-82-5	2.08E-11	1,24, Annual	ST	Average	23%
			Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
			Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
			1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
			Naphthalene	91-20-3	1.75E-11	1,24, Annual	ST	Average	21%
			Total Xylenes	1330-20-7	1.08E-10	1,24, Annual	ST	Average	66%
			1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
			Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
			Propene	115-07-1	2.17E-11	1,24, Annual	ST	Average	20%
			2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
			Carbon Disulfide	75-15-0	6.42E-11	1,24, Annual	ST	Average	46%
			Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%

Table F4
Dispersion Modelling Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
P1	LFG Collection System Vent	STCK1	0.002	Ambient	0.10	6.0	603635.66	4914706.35	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
									Carbon dioxide	124-38-9	4.05E-05	1,24, Annual	ST	Average	63%
									Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
									Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
									Dichlorodifluoromethane	75-71-8	2.26E-10	1,24, Annual	ST	Average	3%
									1,2-Dichlorotetrafluoroethane	76-14-2	2.18E-09	1,24, Annual	ST	Average	84%
									Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
									Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
									Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
									1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
									Trichlorofluoromethane	75-69-4	2.25E-11	1,24, Annual	ST	Average	33%
									Ethanol	64-17-5	2.81E-09	1,24, Annual	ST	Average	47%
									Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
									2-propanol	67-63-0	7.43E-10	1,24, Annual	ST	Average	60%
									2-Propanone	67-64-1	1.32E-10	1,24, Annual	ST	Average	30%
									Methyl Ethyl Ketone	78-93-3	1.42E-11	1,24, Annual	ST	Average	29%
									Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
									Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
									Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
									Ethyl Acetate	141-78-6	2.80E-10	1,24, Annual	ST	Average	32%
									1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
									cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
									trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
									Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
									Chloroform	67-66-3	3.31E-11	1,24, Annual	ST	Average	26%
									Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
									1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
									Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
									1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
									cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
									trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
									Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
									Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
									Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
									Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
									Trichloroethylene	79-01-6	9.17E-12	1,24, Annual	ST	Average	29%
									Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
									Benzene	71-43-2	6.25E-12	1,24, Annual	ST	Average	23%
									Toluene	108-88-3	8.08E-11	1,24, Annual	ST	Average	22%
									Ethylbenzene	100-41-4	9.00E-12	1,24, Annual	ST	Average	25%
									p+m-Xylene	106-42-3	2.50E-11	1,24, Annual	ST	Average	20%
									o-Xylene	95-47-6	9.83E-12	1,24, Annual	ST	Average	22%
									Styrene	100-42-5	1.74E-11	1,24, Annual	ST	Average	49%
									4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,2,4-Trimethylbenzene	95-63-6	4.08E-11	1,24, Annual	ST	Average	31%
									Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%
									Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
									1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
									1,2-Dichlorobenzene	95-50-1	1.00E-11	1,24, Annual	ST	Average	26%
									1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
									Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
									Hexane	110-54-3	1.67E-11	1,24, Annual	ST	Average	38%
									Heptane	142-82-5	3.83E-11	1,24, Annual	ST	Average	42%
									Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
									Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
									Naphthalene	91-20-3	2.33E-11	1,24, Annual	ST	Average	27%
									Total Xylenes	1330-20-7	3.50E-11	1,24, Annual	ST	Average	21%
									1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
									Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
									Propene	115-07-1	5.33E-11	1,24, Annual	ST	Average	48%
									2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
									Carbon Disulfide	75-15-0	2.58E-11	1,24, Annual	ST	Average	19%
									Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%

Table F4
Dispersion Modelling Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
P4	LFG Collection System Vent	STCK2	0.003	Ambient	0.10	6.0	603694.79	4914704.54	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
									Carbon dioxide	124-38-9	2.25E-05	1,24, Annual	ST	Average	35%
									Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
									Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
									Dichlorodifluoromethane	75-71-8	7.28E-09	1,24, Annual	ST	Average	92%
									1,2-Dichlorotetrafluoroethane	76-14-2	3.82E-10	1,24, Annual	ST	Average	15%
									Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
									Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
									Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
									1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
									Trichlorofluoromethane	75-69-4	2.83E-11	1,24, Annual	ST	Average	41%
									Ethanol	64-17-5	1.82E-09	1,24, Annual	ST	Average	30%
									Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
									2-propanol	67-63-0	2.68E-10	1,24, Annual	ST	Average	22%
									2-Propanone	67-64-1	1.73E-10	1,24, Annual	ST	Average	40%
									Methyl Ethyl Ketone	78-93-3	1.58E-11	1,24, Annual	ST	Average	33%
									Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
									Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
									Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
									Ethyl Acetate	141-78-6	2.26E-10	1,24, Annual	ST	Average	26%
									1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
									cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
									trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
									Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
									Chloroform	67-66-3	5.14E-11	1,24, Annual	ST	Average	41%
									Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
									1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
									Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
									1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
									cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
									trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
									Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
									Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
									Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
									Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
									Trichloroethylene	79-01-6	1.33E-11	1,24, Annual	ST	Average	42%
									Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
									Benzene	71-43-2	5.33E-12	1,24, Annual	ST	Average	20%
									Toluene	108-88-3	5.62E-11	1,24, Annual	ST	Average	15%
									Ethylbenzene	100-41-4	7.25E-12	1,24, Annual	ST	Average	20%
									p+m-Xylene	106-42-3	1.75E-11	1,24, Annual	ST	Average	14%
									o-Xylene	95-47-6	7.25E-12	1,24, Annual	ST	Average	16%
									Styrene	100-42-5	9.67E-12	1,24, Annual	ST	Average	27%
									4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,2,4-Trimethylbenzene	95-63-6	4.08E-11	1,24, Annual	ST	Average	31%
									Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%
									Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
									1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
									1,2-Dichlorobenzene	95-50-1	1.83E-11	1,24, Annual	ST	Average	48%
									1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
									Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
									Hexane	110-54-3	1.50E-11	1,24, Annual	ST	Average	34%
									Heptane	142-82-5	3.25E-11	1,24, Annual	ST	Average	35%
									Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
									Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
									Naphthalene	91-20-3	4.42E-11	1,24, Annual	ST	Average	52%
									Total Xylenes	1330-20-7	2.17E-11	1,24, Annual	ST	Average	13%
									1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
									Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
									Propene	115-07-1	3.58E-11	1,24, Annual	ST	Average	32%
									2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
									Carbon Disulfide	75-15-0	4.92E-11	1,24, Annual	ST	Average	35%
									Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%

Table F4
Dispersion Modelling Summary Table

Source Identifier	Source Description	Stack ID	Source Parameters						Emission Data						
			Stack Volumetric Flow Rate [Am³/s]	Stack Exit Gas Temperature [°C]	Stack Inner Diameter [m]	Stack Height Above Grade [m]	Stack Location [X]	Stack Location [Y]	Contaminant	CAS No.	Maximum Emission Rate [g/s]	Averaging Period [hours]	Emission Estimating Technique	Emissions Data Quality	Percentage of Overall Emissions [%]
P6	LFG Collection System Vent	STCK3	0.0030	Ambient	0.10	6.0	603733.91	4914697.11	Methane	74-82-8	5.47E-07	1,24, Annual	ST	Average	33%
									Carbon dioxide	124-38-9	1.50E-06	1,24, Annual	ST	Average	2%
									Carbon monoxide	630-08-0	9.55E-07	1,24, Annual	ST	Average	33%
									Hydrogen sulfide	7783-06-4	8.13E-09	1,24, Annual	ST	Average	33%
									Dichlorodifluoromethane	75-71-8	3.98E-10	1,24, Annual	ST	Average	5%
									1,2-Dichlorotetrafluoroethane	76-14-2	2.33E-11	1,24, Annual	ST	Average	<1%
									Chloromethane	74-87-3	1.00E-11	1,24, Annual	ST	Average	33%
									Vinyl Chloride	75-01-4	4.25E-12	1,24, Annual	ST	Average	33%
									Chloroethane	75-00-3	1.33E-11	1,24, Annual	ST	Average	33%
									1,3-Butadiene	106-99-0	1.83E-11	1,24, Annual	ST	Average	33%
									Trichlorofluoromethane	75-69-4	1.83E-11	1,24, Annual	ST	Average	27%
									Ethanol	64-17-5	1.38E-09	1,24, Annual	ST	Average	23%
									Trichlorotrifluoroethane	26523-64-8	1.92E-11	1,24, Annual	ST	Average	33%
									2-propanol	67-63-0	2.33E-10	1,24, Annual	ST	Average	19%
									2-Propanone	67-64-1	1.28E-10	1,24, Annual	ST	Average	30%
									Methyl Ethyl Ketone	78-93-3	1.84E-11	1,24, Annual	ST	Average	38%
									Methyl Isobutyl Ketone	108-10-1	1.33E-11	1,24, Annual	ST	Average	33%
									Methyl Butyl Ketone	591-78-6	6.83E-11	1,24, Annual	ST	Average	33%
									Methyl t-butyl ether	1634-04-4	1.17E-11	1,24, Annual	ST	Average	33%
									Ethyl Acetate	141-78-6	3.78E-10	1,24, Annual	ST	Average	43%
									1,1-Dichloroethylene	75-35-4	6.58E-12	1,24, Annual	ST	Average	33%
									cis-1,2-Dichloroethylene	156-59-2	6.58E-12	1,24, Annual	ST	Average	33%
									trans-1,2-Dichloroethylene	156-60-5	6.58E-12	1,24, Annual	ST	Average	33%
									Methylene Chloride	75-09-2	3.50E-11	1,24, Annual	ST	Average	33%
									Chloroform	67-66-3	4.24E-11	1,24, Annual	ST	Average	33%
									Carbon Tetrachloride	56-23-5	1.08E-11	1,24, Annual	ST	Average	33%
									1,1-Dichloroethane	75-34-3	6.75E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloroethane	107-06-2	6.75E-12	1,24, Annual	ST	Average	33%
									Ethylene Dibromide	106-93-4	1.25E-11	1,24, Annual	ST	Average	33%
									1,1,1-Trichloroethane	71-55-6	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2-Trichloroethane	79-00-5	9.17E-12	1,24, Annual	ST	Average	33%
									1,1,2,2-Tetrachloroethane	79-34-5	1.17E-11	1,24, Annual	ST	Average	33%
									cis-1,3-Dichloropropene	10061-01-5	7.58E-12	1,24, Annual	ST	Average	33%
									trans-1,3-Dichloropropene	10061-02-6	7.58E-12	1,24, Annual	ST	Average	33%
									1,2-Dichloropropane	78-87-5	7.67E-12	1,24, Annual	ST	Average	33%
									Bromomethane	74-83-9	6.50E-12	1,24, Annual	ST	Average	33%
									Bromoform	75-25-2	3.42E-11	1,24, Annual	ST	Average	33%
									Bromodichloromethane	75-27-4	2.25E-11	1,24, Annual	ST	Average	33%
									Dibromochloromethane	124-48-1	2.83E-11	1,24, Annual	ST	Average	33%
									Trichloroethylene	79-01-6	9.17E-12	1,24, Annual	ST	Average	29%
									Tetrachloroethylene	127-18-4	1.17E-11	1,24, Annual	ST	Average	33%
									Benzene	71-43-2	1.53E-11	1,24, Annual	ST	Average	57%
									Toluene	108-88-3	2.30E-10	1,24, Annual	ST	Average	63%
									Ethylbenzene	100-41-4	1.98E-11	1,24, Annual	ST	Average	55%
									p+m-Xylene	106-42-3	8.06E-11	1,24, Annual	ST	Average	65%
									o-Xylene	95-47-6	2.78E-11	1,24, Annual	ST	Average	62%
									Styrene	100-42-5	8.50E-12	1,24, Annual	ST	Average	24%
									4-ethyltoluene	622-96-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,3,5-Trimethylbenzene	108-67-8	4.08E-11	1,24, Annual	ST	Average	33%
									1,2,4-Trimethylbenzene	95-63-6	4.92E-11	1,24, Annual	ST	Average	38%
									Chlorobenzene	108-90-7	7.67E-12	1,24, Annual	ST	Average	33%
									Benzyl chloride	100-44-7	4.33E-11	1,24, Annual	ST	Average	33%
									1,3-Dichlorobenzene	541-73-1	4.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dichlorobenzene	106-46-7	1.00E-11	1,24, Annual	ST	Average	33%
									1,2-Dichlorobenzene	95-50-1	1.00E-11	1,24, Annual	ST	Average	26%
									1,2,4-Trichlorobenzene	120-82-1	6.17E-11	1,24, Annual	ST	Average	33%
									Hexachlorobutadiene	87-68-3	9.17E-11	1,24, Annual	ST	Average	33%
									Hexane	110-54-3	1.18E-11	1,24, Annual	ST	Average	27%
									Heptane	142-82-5	2.08E-11	1,24, Annual	ST	Average	23%
									Cyclohexane	110-82-7	1.17E-11	1,24, Annual	ST	Average	33%
									Tetrahydrofuran	109-99-9	2.00E-11	1,24, Annual	ST	Average	33%
									1,4-Dioxane	123-91-1	6.00E-11	1,24, Annual	ST	Average	33%
									Naphthalene	91-20-3	1.75E-11	1,24, Annual	ST	Average	21%
									Total Xylenes	1330-20-7	1.08E-10	1,24, Annual	ST	Average	66%
									1,1,1,2-Tetrachloroethane	630-20-6	1.17E-11	1,24, Annual	ST	Average	33%
									Vinyl Bromide	593-60-2	1.50E-11	1,24, Annual	ST	Average	33%
									Propene	115-07-1	2.17E-11	1,24, Annual	ST	Average	20%
									2,2,4-Trimethylpentane	540-84-1	1.58E-11	1,24, Annual	ST	Average	33%
									Carbon Disulfide	75-15-0	6.42E-11	1,24, Annual	ST	Average	46%
									Vinyl Acetate	108-05-4	1.17E-11	1,24, Annual	ST	Average	33%

Table F5
Emission Summary Table

Contaminant Name	CAS RN	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	Ministry POI Limit [µg/m³]	Limiting Effect	Sch.	Source	Benchmark	% of POI Limit	Notes	Version of ACB List
1,1,1,2-Tetrachloroethane	630-20-6	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	0.5	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
1,1,1-Trichloroethane	71-55-6	2.75E-11	AERMOD (v. 19191)	3.70E-08	24-hour	115000	Health	Sch. 3	Standard	B1	<1%		Version 2.0 - April 2018
1,1,2,2-Tetrachloroethane	79-34-5	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	0.1	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
1,1,2-Trichloroethane	79-00-5	2.75E-11	AERMOD (v. 19191)	3.70E-08	24-hour	0.3	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
1,1-Dichloroethane	75-34-3	2.03E-11	AERMOD (v. 19191)	2.72E-08	24-hour	165	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
1,1-Dichloroethane	75-34-3	2.03E-11	AERMOD (v. 19191)	2.72E-08	24-hour	1650	—	Sch. 6	URT	—	Below URT		
1,1-Dichloroethylene	75-35-4	1.98E-11	AERMOD (v. 19191)	2.65E-08	24-hour	10	Health	Sch. 3	Standard	B1	<1%		Version 2.0 - April 2018
1,2,4-Trichlorobenzene	120-82-1	1.85E-10	AERMOD (v. 19191)	2.49E-07	24-hour	400	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
1,2,4-Trimethylbenzene	95-63-6	1.31E-10	AERMOD (v. 19191)	1.70E-07	24-hour	220	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
1,2,4-Trimethylbenzene	95-63-6	1.31E-10	AERMOD (v. 19191)	1.70E-07	24-hour	2200	—	Sch. 6	URT	—	Below URT		
1,2-Dichlorobenzene	95-50-1	3.83E-11	AERMOD (v. 19191)	8.95E-08	1-hour	30500	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
1,2-Dichloroethane	107-06-2	2.03E-11	AERMOD (v. 19191)	2.72E-08	24-hour	2	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
1,2-Dichloroethane	107-06-2	2.03E-11	AERMOD (v. 19191)	2.72E-08	24-hour	200	—	Sch. 6	URT	—	Below URT		
1,2-Dichloropropane	78-87-5	2.30E-11	AERMOD (v. 19191)	3.09E-08	24-hour	2400	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
1,2-Dichlorotetrafluoroethane	76-14-2	2.58E-09	AERMOD (v. 19191)	1.12E-05	24-hour	700000	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 10)	Version 2.0 - April 2018
1,3,5-Trimethylbenzene	108-67-8	1.23E-10	AERMOD (v. 19191)	1.65E-07	24-hour	220	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
1,3,5-Trimethylbenzene	108-67-8	1.23E-10	AERMOD (v. 19191)	1.65E-07	24-hour	2200	—	Sch. 6	URT	—	Below URT		
1,3-Butadiene	106-99-0	5.50E-11	AERMOD (v. 19191)	3.02E-08	Annual	2	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 19, Table 2, 3, URT - Note 4, Table 4)	Version 2.0 - April 2018
1,3-Butadiene	106-99-0	5.50E-11	AERMOD (v. 19191)	7.38E-08	24-hour	300	—	Sch. 6	URT	—	Below URT		
1,3-Butadiene	106-99-0	5.50E-11	AERMOD (v. 19191)	3.02E-08	Annual	20	—	—	AAV	—	<1%		
1,3-Dichlorobenzene	541-73-1	1.20E-10	AERMOD (v. 19191)	1.61E-07	24-hour	50	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
1,4-Dichlorobenzene	106-46-7	3.00E-11	AERMOD (v. 19191)	4.03E-08	24-hour	95	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
1,4-Dichlorobenzene	106-46-7	3.00E-11	AERMOD (v. 19191)	4.03E-08	24-hour	950	—	Sch. 6	URT	—	Below URT		
1,4-Dioxane	123-91-1	1.80E-10	AERMOD (v. 19191)	2.42E-07	24-hour	3500	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 6)	Version 2.0 - April 2018
2,2,4-Trimethylpentane	540-84-1	4.75E-11	AERMOD (v. 19191)	6.38E-08	24-hour	1750	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
2-propanol	67-63-0	1.24E-09	AERMOD (v. 19191)	2.79E-06	24-hour	7300	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
2-propanol	67-63-0	1.24E-09	AERMOD (v. 19191)	2.79E-06	24-hour	73000	—	Sch. 6	URT	—	Below URT		

Table F5
Emission Summary Table

Contaminant Name	CAS RN	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	Ministry POI Limit [µg/m³]	Limiting Effect	Sch.	Source	Benchmark	% of POI Limit	Notes	Version of ACB List
2-Propanone	67-64-1	4.33E-10	AERMOD (v. 19191)	6.60E-07	24-hour	11880	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
2-Propanone	67-64-1	4.33E-10	AERMOD (v. 19191)	6.60E-07	24-hour	118800	—	Sch. 6	URT	—	Below URT		
4-ethyltoluene	622-96-8	1.23E-10	AERMOD (v. 19191)	1.65E-07	24-hour	625	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Benzene	71-43-2	2.68E-11	AERMOD (v. 19191)	2.02E-08	Annual	0.45	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 19, Table 2, 3 URT - Note 4, Table 4)	Version 2.0 - April 2018
Benzene	71-43-2	2.68E-11	AERMOD (v. 19191)	4.88E-08	24-hour	100	—	Sch. 6	URT	—	Below URT		
Benzene	71-43-2	2.68E-11	AERMOD (v. 19191)	2.02E-08	Annual	4.5	—	—	AAV	—	<1%		
Benzyl chloride	100-44-7	1.30E-10	AERMOD (v. 19191)	1.75E-07	24-hour	0.1	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Bromodichloromethane	75-27-4	6.75E-11	AERMOD (v. 19191)	9.08E-08	24-hour	350	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Bromoform	75-25-2	1.03E-10	AERMOD (v. 19191)	1.38E-07	24-hour	55	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
Bromomethane	74-83-9	1.95E-11	AERMOD (v. 19191)	2.62E-08	24-hour	1350	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
Carbon dioxide	124-38-9	6.45E-05	AERMOD (v. 19191)	1.53E-01	24-hour	255800	Health	Sch. 3	SL-PA	B2	Below B2		Version 2.0 - April 2018
Carbon Disulfide	75-15-0	1.39E-10	AERMOD (v. 19191)	2.17E-07	24-hour	330	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be up	Version 2.0 - April 2018
Carbon monoxide	630-08-0	2.86E-06	AERMOD (v. 19191)	6.18E-03	1/2-hour	6000	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 9)	Version 2.0 - April 2018
Carbon Tetrachloride	56-23-5	3.25E-11	AERMOD (v. 19191)	4.36E-08	24-hour	2.4	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Carbon Tetrachloride	56-23-5	3.25E-11	AERMOD (v. 19191)	4.36E-08	24-hour	24	—	Sch. 6	URT	—	Below URT		
Chlorobenzene	108-90-7	2.30E-11	AERMOD (v. 19191)	4.09E-08	1-hour	3500	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	Version 2.0 - April 2018
Chlorobenzene	108-90-7	2.30E-11	AERMOD (v. 19191)	6.75E-08	10-minute	4500	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	Version 2.0 - April 2018
Chloroethane	75-00-3	4.00E-11	AERMOD (v. 19191)	5.37E-08	24-hour	5600	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Chloroethane	75-00-3	4.00E-11	AERMOD (v. 19191)	5.37E-08	24-hour	25000	—	Sch. 6	URT	—	Below URT		
Chloroform	67-66-3	1.27E-10	AERMOD (v. 19191)	1.98E-07	24-hour	1	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Chloroform	67-66-3	1.27E-10	AERMOD (v. 19191)	1.98E-07	24-hour	100	—	Sch. 6	URT	—	Below URT		
Chloromethane	74-87-3	3.00E-11	AERMOD (v. 19191)	4.03E-08	24-hour	320	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Chloromethane	74-87-3	3.00E-11	AERMOD (v. 19191)	4.03E-08	24-hour	3200	—	Sch. 6	URT	—	Below URT		
cis-1,2-Dichloroethylene	156-59-2	1.98E-11	AERMOD (v. 19191)	2.65E-08	24-hour	105	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
cis-1,3-Dichloropropene	10061-01-5	2.28E-11	AERMOD (v. 19191)	3.06E-08	24-hour	2.25	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Cyclohexane	110-82-7	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	6100	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Cyclohexane	110-82-7	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	61000	—	Sch. 6	URT	—	Below URT		
Dibromochloromethane	124-48-1	8.50E-11	AERMOD (v. 19191)	1.14E-07	24-hour	0.2	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018

Table F5
Emission Summary Table

Contaminant Name	CAS RN	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	Ministry POI Limit [µg/m³]	Limiting Effect	Sch.	Source	Benchmark	% of POI Limit	Notes	Version of ACB List
Dichlorodifluoromethane	75-71-8	7.90E-09	AERMOD (v. 19191)	2.35E-05	24-hour	500000	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 10)	Version 2.0 - April 2018
Ethanol (ethyl alcohol)	64-17-5	6.00E-09	AERMOD (v. 19191)	3.46E-05	1-hour	19000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
Ethyl Acetate	141-78-6	8.83E-10	AERMOD (v. 19191)	1.99E-06	1-hour	19000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
Ethylbenzene	100-41-4	3.61E-11	AERMOD (v. 19191)	6.34E-08	24-hour	1000	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, URT - Note 4, Table 4)	Version 2.0 - April 2018
Ethylbenzene	100-41-4	3.61E-11	AERMOD (v. 19191)	1.70E-07	10-minute	1900	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	Version 2.0 - April 2018
Ethylbenzene	100-41-4	3.61E-11	AERMOD (v. 19191)	6.34E-08	24-hour	10000	—	Sch. 6	URT	—	Below URT		
Ethylene Dibromide	106-93-4	3.75E-11	AERMOD (v. 19191)	5.04E-08	24-hour	3	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
Heptane	142-82-5	9.17E-11	AERMOD (v. 19191)	1.48E-07	24-hour	11000	Health	Sch. 3	Standard	B1	<1%		Version 2.0 - April 2018
Hexachlorobutadiene	87-68-3	2.75E-10	AERMOD (v. 19191)	3.70E-07	24-hour	0.225	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Hexane	110-54-3	4.35E-11	AERMOD (v. 19191)	6.50E-08	24-hour	7500	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Hexane	110-54-3	4.35E-11	AERMOD (v. 19191)	6.50E-08	24-hour	25000	—	Sch. 6	URT	—	Below URT		
Hexane	110-54-3	4.35E-11	AERMOD (v. 19191)	6.50E-08	24-hour	25000	—	Sch. 6	URT	—	Below URT		
Hydrogen sulfide	7783-06-4	2.44E-08	AERMOD (v. 19191)	3.28E-05	24-hour	7	Health	Sch. 3	Standard	B1	<1%	ACB List (Notes 2, 3, 13, 14, URT - Note 4, Table 4)	Version 2.0 - April 2018
Hydrogen sulfide	7783-06-4	2.44E-08	AERMOD (v. 19191)	7.15E-05	10-minute	13	Odour	Sch. 3	Standard	B1	<1%	ACB List (Notes 2, 3, 13, 14, URT - Note 4, Table 4)	Version 2.0 - April 2018
Hydrogen sulfide	7783-06-4	2.44E-08	AERMOD (v. 19191)	3.28E-05	24-hour	70	—	Sch. 6	URT	—	Below URT		
Methane	74-82-8	1.64E-06	AERMOD (v. 19191)	2.21E-03	24-hour	37330	Health	Sch. 3	SL-PA	B2	Below B2		Version 2.0 - April 2018
Methyl Butyl Ketone (2-Hexanone)	591-78-6	2.05E-10	AERMOD (v. 19191)	2.76E-07	24-hour	150	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Methyl Ethyl Ketone (2-Butanone)	78-93-3	4.84E-11	AERMOD (v. 19191)	6.53E-08	24-hour	1000	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Methyl Ethyl Ketone (2-Butanone)	78-93-3	4.84E-11	AERMOD (v. 19191)	6.53E-08	24-hour	10000	—	Sch. 6	URT	—	Below URT		
Methyl Isobutyl Ketone	108-10-1	4.00E-11	AERMOD (v. 19191)	5.37E-08	24-hour	1200	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
Methyl t-butyl ether (MTBE)	1634-04-4	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	7000	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
Methylene Chloride(Dichloromethane)	75-09-2	1.05E-10	AERMOD (v. 19191)	1.41E-07	24-hour	220	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018

Table F5
Emission Summary Table

Contaminant Name	CAS RN	Total Facility Emission Rate [g/s]	Air Dispersion Model Used	Maximum POI Concentration [µg/m³]	Averaging Period [hours]	Ministry POI Limit [µg/m³]	Limiting Effect	Sch.	Source	Benchmark	% of POI Limit	Notes	Version of ACB List
Methylene Chloride(Dichloromethane)	75-09-2	1.05E-10	AERMOD (v. 19191)	1.41E-07	24-hour	22000	—	Sch. 6	URT	—	Below URT		
Naphthalene	91-20-3	8.50E-11	AERMOD (v. 19191)	1.57E-07	24-hour	22.5	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	Version 2.0 - April 2018
Naphthalene	91-20-3	8.50E-11	AERMOD (v. 19191)	3.55E-07	10-minute	50	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3)	Version 2.0 - April 2018
Trichlorotrifluoroethane	26523-64-8	5.75E-11	AERMOD (v. 19191)	7.75E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		
p+m-Xylene	106-42-3	1.23E-10	AERMOD (v. 19191)	2.51E-07	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		
o-Xylene	95-47-6	4.49E-11	AERMOD (v. 19191)	8.73E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		
Vinyl Bromide	593-60-2	4.50E-11	AERMOD (v. 19191)	6.05E-08	24-hour	0.1	—	—	De Minimus	—	Below De Minimus		
Propene	115-07-1	1.11E-10	AERMOD (v. 19191)	2.04E-07	24-hour	4000	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Propene	115-07-1	1.11E-10	AERMOD (v. 19191)	2.04E-07	24-hour	40000	—	Sch. 6	URT	—	Below URT		
Styrene	100-42-5	3.56E-11	AERMOD (v. 19191)	6.63E-08	24-hour	400	Health	Sch. 3	Standard	B1	<1%		Version 2.0 - April 2018
Tetrachloroethylene	127-18-4	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	360	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Tetrachloroethylene	127-18-4	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	3600	—	Sch. 6	URT	—	Below URT		
Tetrahydrofuran	109-99-9	6.00E-11	AERMOD (v. 19191)	8.07E-08	24-hour	93000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
Toluene	108-88-3	3.67E-10	AERMOD (v. 19191)	7.21E-07	24-hour	2000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (To be updated - Note 5)	Version 2.0 - April 2018
Total Xylenes	1330-20-7	1.65E-10	AERMOD (v. 19191)	3.36E-07	24-hour	730	Health	Sch. 3	Standard	B1	<1%	ACB List (Note 2, 22, URT - Note 4, Table 4)	Version 2.0 - April 2018
Total Xylenes	1330-20-7	1.65E-10	AERMOD (v. 19191)	9.25E-07	10-minute	3000	Odour	Sch. 3	Guideline	B1	<1%	ACB List (Note 2, 3, 22)	Version 2.0 - April 2018
Total Xylenes	1330-20-7	1.65E-10	AERMOD (v. 19191)	3.36E-07	24-hour	7300	—	Sch. 6	URT	—	Below URT		
trans-1,2-Dichloroethylene	156-60-5	1.98E-11	AERMOD (v. 19191)	2.65E-08	24-hour	105	Health	Sch. 3	Guideline	B1	<1%		Version 2.0 - April 2018
trans-1,3-Dichloropropene	10061-02-6	2.28E-11	AERMOD (v. 19191)	3.06E-08	24-hour	2.25	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Trichloroethylene	79-01-6	3.17E-11	AERMOD (v. 19191)	5.02E-08	24-hour	12	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Trichloroethylene	79-01-6	3.17E-11	AERMOD (v. 19191)	5.02E-08	24-hour	1200	—	Sch. 6	URT	—	Below URT		
Trichlorofluoromethane (FREON 11)	75-69-4	6.92E-11	AERMOD (v. 19191)	1.06E-07	24-hour	6000	Health	Sch. 3	Guideline	B1	<1%	ACB List (Note 10)	Version 2.0 - April 2018
Vinyl Acetate	108-05-4	3.50E-11	AERMOD (v. 19191)	4.72E-08	24-hour	1000	Health	Sch. 3	SL-JSL	B2	Below B2		Version 2.0 - April 2018
Vinyl Chloride	75-01-4	1.28E-11	AERMOD (v. 19191)	1.71E-08	24-hour	1	Health	Sch. 3	Standard	B1	<1%	ACB List (URT - Note 4, Table 4)	Version 2.0 - April 2018
Vinyl Chloride	75-01-4	1.28E-11	AERMOD (v. 19191)	1.71E-08	24-hour	100	—	Sch. 6	URT	—	Below URT		



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