



REPORT

Bunker's Creek Historic Waste Sites

2024 Annual Monitoring Report

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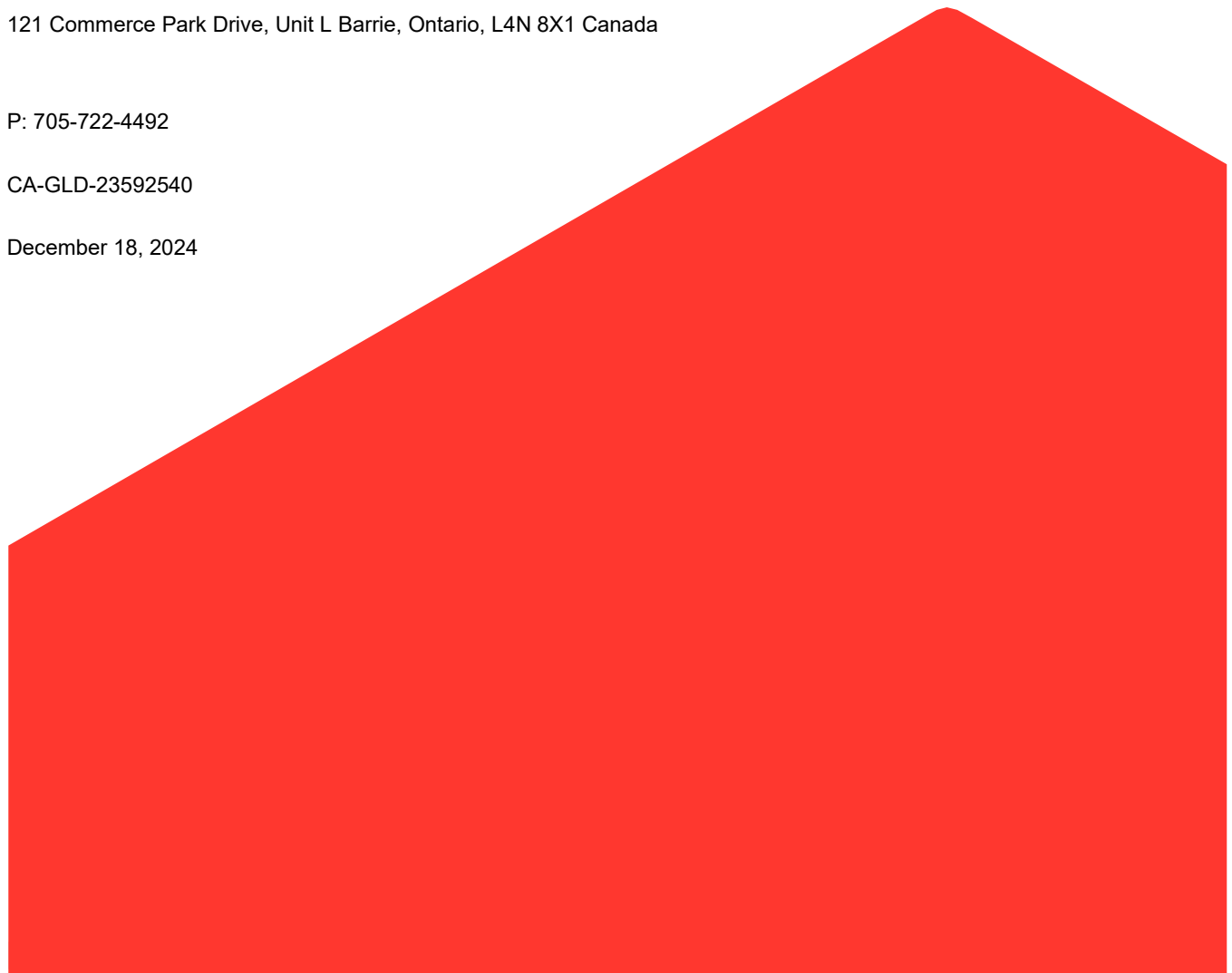
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EXECUTIVE SUMMARY

WSP Canada Inc. (WSP) was retained by the City of Barrie (City), to carry out the 2024 Annual Monitoring Program at Historic Waste Sites within the City of Barrie located along Bunker's and Dymont's Creeks, generally between Anne Street and Bradford Street approximately 300 to 400 metres (m) west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 22 and September 24, 2024 for the four waste disposal sites referred to as Sites 1, 2, 3 and 7 along Bunker's Creek (see **Figures 1 and 2**). Sites 4, 5 and 6 (i.e., the Dymont's Historic Waste Sites) are discussed in a separate report. This work program is intended to constitute an assessment relative to the environmental influence of the landfills, notably on the quality of Bunker's Creek and adjacent soil gas methane concentrations.

The waste sites are more or less continuous on both sides of Bunker's Creek (north of the creek in the western portion and south of the creek in the central and eastern portions) and are herein referred to as the "Bunker's Creek Landfills". The sites are bounded by Anne Street to the west, Bradford Street to the east, Perry Street to the north, and Vespra Street to the south. Waste was identified in the area southeast of the Vespra and Innisfil Street intersection (former Fire Hall); north of Vespra Street, the extent of waste could not be positively identified, as these portions of the sites are on private property. Limits of waste fill in these areas are largely based on historical aerial photography and mapping interpretation and have been accepted by the Ministry of Environment, Conservation and Parks (MECP).

The City implements a program to monitor surface water quality in Bunker's and Dymont's Creek and the potential for explosive concentrations of methane in soil-gas. Impacts associated with ground and surface water impacts from municipal solid 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 Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance. Standards for methane in landfill gas (LFG) are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%).

The following scope of work was implemented for the 2024 monitoring program.

- Measurement of water levels and LFG monitoring at 12 existing gas probe locations (GP-B1, GPB3, GP-B7, GP-B8, GP-B14, GP-B17 through GP-B22 and GP-B24 in February (frozen ground) and September 2024;
- Surface water quality samples were collected at the five established surface water monitoring locations (SWB1 through SWB5) on September 13, 2024; and
- Analysis of the surface water samples for major ions and indicators, metals, polycyclic aromatic hydrocarbons (PAH), VOC and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4).

The primary findings based on the 2024 monitoring program results are as follow:

- Surface water quality remains stable in comparison to historical data. Surface water is the ultimate receptor for potential groundwater impacts from the historical waste sites. Based on the results obtained during this investigation during the 2024 sampling event, it is concluded that the historic waste sites are not adversely affecting surface water quality of Bunker's Creek;
- Polycyclic aromatic hydrocarbons (PAH) were not detected at any surface water locations in 2024, consistent with 2022 and 2023 results. Whereas occasional detections of PAH have been inconsistently observed, the data indicates stable trends;

- During the 2024 monitoring program, one gas probe (GP-B1) and an adjacent monitoring well (MW-B1) were irreparably damaged as a result of a fire from a nearby encampment and could not be monitored. Decommissioning of this well is required under Ontario Regulation 903;
- The methane concentrations measured in 2024 at gas probes located adjacent to waste fill areas 1, 2,3 and 7 ranged from non-detect to 0.3% and are below the 1% action level at all locations. Following damage to GP-B1 there is no data available for the area in the north portion of Site 1 however, historical data indicates that methane has not been present at this probe since 2012; and,
- The north part of Site 1 contains an estimated volume of 15,000 m³ of inert fill including concrete and asphalt (e.g., asphalt, concrete). This part of the site is separated from the south part by Bunker's Creek, which acts as a hydraulic barrier to landfill gas migration from the area south of the creek. Given the low to absent methane concentrations at GP-B1 up to 2023 and the available information regarding waste characteristics in the north part of Site 1, it is recommended that further monitoring of this area be discontinued. Should future development be considered on Site 1, additional investigation may be necessary.

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1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by the City of Barrie (City), to carry out the 2024 Annual Monitoring Program at Historic Waste Sites within the City of Barrie located along Bunker's and Dymont's Creeks, generally between Anne Street and Bradford Street approximately 300 to 400 metres (m) west of Kempenfelt Bay. This report describes the results of monitoring conducted between February 22 and September 24, 2024 for the four waste disposal sites referred to as Sites 1, 2, 3 and 7 along Bunker's Creek (see **Figures 1 and 2**). Sites 4, 5 and 6 (i.e., the Dymont's Historic Waste Sites) are discussed in a separate report. This work program is intended to constitute an assessment relative to the environmental influence of the landfills, notably on the quality of Bunker's Creek and adjacent soil gas methane concentrations.

Between 2011 and 2013, Golder Associates Ltd. (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 and precursors) D-4 Studies and of the Environmental Site Assessment process. The nine sites were part of an identified list of waste sites 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 these waste sites 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 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 waste sites were identified, four located along Bunker's Creek and three located along Dymont's Creek. These sites are located on lands currently used for 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 contain largely inert fill, waste materials were identified at most sampling locations; key indicators of the impact of the waste fill were identified. Previous exceedances tended to be located within or immediately adjacent to the waste fill; monitoring of landfill gas in gas probes located within waste ceased in 2019.

Parameters associated with ground and surface water 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 volatile organic compounds (VOC) from products co-disposed in the waste. The Provincial Water Quality Objectives (PWQO) are used to assess surface water compliance.

Standards for methane in LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%) and the MECP guidance document "*D-4-1 Assessing Methane Hazards from Landfill Sites*" (July 2021).

2 BACKGROUND

Four of the nine waste disposal sites identified in the Ministry Waste Disposal Site Inventory within the City of Barrie are included in the Bunker's Creek area:

- Site 1 – Anne Street North and Vespra Street: Located on the northwest corner of Anne Street North and Vespra Street – closed in 1956 – Ministry Site No. X 4101;
- Site 2 – Vespra Street and Innisfil Street: Located northwest of the intersection of Vespra Street and Innisfil Street – closed in 1959 – Ministry Site No. X 4102;
- Site 3 – Vespra Street and Innisfil Street: Located on the northeast corner of Vespra Street and Innisfil Street – closed in 1960 – Ministry Site No. X 4103; and,
- Site 7 – Vespra Street and Bradford Street: Located northeast of the intersection of Innisfil Street and Vespra Street – closed in 1964 – Ministry Site No. X4107.

The findings of the earlier investigations estimated the approximate areal extent of waste fill, as illustrated on **Figure 2**. It is noted that the delineation of waste fill extent was limited to investigation of the portions of sites accessible to the City (i.e., City owned lands). Access to Site 2 was further limited due to forest cover and steep slopes in the vicinity of Milligan's Pond.

The waste fill sites are more or less continuous on both sides of Bunker's Creek (north of the creek in the western portion and south of the creek in the central and eastern portions) (and herein referred to as the "Bunker's Creek Landfills"), and are bounded by Anne Street to the west, Bradford Street to the east, Perry Street to the north, and Vespra Street to the south. In the area of the former Fire Hall property (southeast of the Vespra and Innisfil Street intersection), the available information, including previous 1996 investigations completed by others (Terraprobe, 1996), indicates that the waste extends to the north of the former building (demolished in 2013), but not to the south. It is not known whether there was waste under this building. In other areas, for example, portions of the landfill north of Vespra Street, the extent of waste could not be positively identified as these parts of the landfills are on private property. Limits of waste fill in these areas are largely based on historical aerial photography and mapping interpretation and have been accepted by the Ministry.

The material within the Bunker's Creek Landfills consists of coarse soil fill overlying thin layers of waste material. The waste identified in the boreholes consisted largely of solid (e.g., glass, plastic, brick, metal) material and did not contain putrescible materials. Waste thickness typically ranges from very thin (0.05 m) at several locations to a maximum thickness of 2.59 metres (m) encountered on the south side of Bunker's Creek, east of Milligan's Pond. The maximum depth of waste extended to 7.21 m below ground surface (bgs) south of Bunker's Creek in the Boys Street easement. Cover material, consisting of topsoil and/or fill, ranged in thickness from 1.27 m to 8.33 m.

The interpreted groundwater flow direction under the waste disposal sites is consistently toward Bunker's Creek, and ultimately to the east toward Lake Simcoe. Earlier groundwater monitoring results at wells MW-B1, MW-B3, MW-B7, located at the northern limits of Sites 1 and 2, and to the east of the north portion of Site 7 indicated the waste does not impact these areas. This is consistent with the anticipated limits of the waste fill identified in the initial investigations (Golder, 2013). Based on interpreted shallow horizontal groundwater flow, it has been concluded that groundwater outside the limits of waste fill will not be impacted. Monitoring of groundwater quality ceased in 2016.

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) has not migrated significantly beyond the waste fill limits and concentrations are generally below a concentration of 1% (i.e., the LEL of methane). Exceptions to this include gas probes located within the waste fill areas in the central and southern portions of these landfills. As LFG concentrations within the waste remained relatively consistent between 2013 and 2018, LFG monitoring in gas probes located within waste fill was removed from the monitoring program in 2019 and a number of the monitoring wells that were installed in the waste have since been decommissioned.

3 SCOPE AND FIELD INVESTIGATION METHODS

3.1 Monitoring Program

The City implements a monitoring program to monitor surface water quality in Bunker’s Creek and the potential for explosive concentrations of methane in the soil-gas. The 2024 monitoring program locations are listed below. Surface water samples are collected annually, in the fall. Based on the presence of polycyclic aromatic hydrocarbons (PAHs) at SWB1 and SWB2 in September 2021, additional surface water sampling events were completed in April 2022 and 2023. This additional sampling event (i.e., spring event) has ceased.

Landfill gas monitoring is completed annually under frozen ground conditions. Monitoring of LFG at wells located within the waste fill is not required unless pertinent to assessment of specific property use. It is noted that an additional LFG sampling event was completed in 2024; not typically required.

Table 1: 2024 Sampling Locations

Landfill Gas Probes
GP-B1, GP-B3, GP-B7, GP-B8, GP-B14, GP-B17 through GP-B22 and GP-B24
Surface Water Sampling Locations
SWB1, SWB2, SWB3, SWB4, SWB5

The following scope of work was implemented for the 2024 monitoring program.

- Measurement of water levels and landfill gas monitoring of 12 existing gas probe locations (GP-B1, GP-B3, GP-B7, GP-B8, GP-B14, GP-B17 through GP-B22 and GP-B24 in February 2024 (frozen ground) and September 2024;
- Surface water quality samples were collected at the five established surface water monitoring locations (SWB1 through SWB5) on September 13, 2024; and
- Analysis of the surface water samples for major ions and indicators, metals, polycyclic aromatic hydrocarbons (PAH), VOC and petroleum hydrocarbon fractions F1 to F4 (PHC F1 to F4).

3.2 Surface Water Sampling

In 2024, five surface water samples (SWB1 through SWB5) were collected within Bunker’s Creek on September 13, 2024 (see **Figure 2** for sampling locations). The Spring sampling event (i.e., April) was removed from the sampling program, as of 2024.

In addition to the sampling locations, WSP visually assessed the conditions along the entire portion of the creek from the bank during each sampling event and no other visible leachate seeps (i.e., sheen or discolouration) were noted.

Samples were collected from downstream (SWB1) to upstream (SWB5) locations to prevent cross-contamination. To prevent spillage of preservatives and to 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 F1 to F4, PAH and major ions and indicators. **Table 2** provides a summary of the measured field parameters for the surface water samples submitted- for laboratory analysis.

Table 2: Summary of Analyzed Surface Water Samples – Bunker’s Creek Landfills – September 13, 2024

Sample I.D.	Location Relative to Closed Landfills	Field pH	Field Temp. (°C)	Field Cond. (µS/cm)	ORP (mV)	Flow
SWB1	Downstream	7.7	15.1	1776	184	Slow
SWB2	Sites 2, 3 and 7	7.9	15.2	1761	192	Slow
SWB3	Site 2	7.7	15.5	1726	212	Slow
SWB4	Sites 1 and 2	7.9	13.7	1580	201	Stagnant
SWB5	Upstream	7.9	14.8	1694	209	Fast

Notes:

µS/cm = micro Siemens per centimetre

ORP = Oxidation-reduction potential

mV = Millivolts

NR = Not recorded

3.3 Analytical Program

WSP retained the services of SGS Canada Inc., (SGS) of Lakefield, Ontario to analyze the water quality samples. SGS is accredited by Canadian Association for Laboratory Accreditation Inc. (CALA program).

Analytical methods are reported on the laboratory Certificates of Analysis provided in **Appendix C**.

3.3.1 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 SGS 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 laboratory, the following QA/QC samples were also submitted during the work program:

- One surface water field duplicate sample (labelled DUP1) was submitted for analysis of analyzed parameters from SW-B3 during the September 2024 surface water sampling event;
- One blind field blank sample was submitted for analysis of the analyzed parameters during the September 2024 surface water sampling event; and
- One trip blank sample was submitted for analysis of VOC and/or PHC F1 during the September 2024 surface water sampling event.

3.4 Landfill Gas Sampling

A portable high-volume pump (10 L/min) was used to purge three times the volume of each 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 or GEM 5000 landfill gas monitor.

Table 7 (attached) provides a full list of readings in the gas probes. **Figure 5** provides a summary of methane gas concentrations in plan-view. This figure depicts data collected during the February 2024 sampling event (frozen ground conditions).

At some locations (i.e., GP-B7, GP-B18 and GP-B19), the screened interval above the water table is thin (greater than 90% saturated), which may result in variation of measured LFG concentrations (i.e., periods with higher water table conditions could reduce the ability of the well to accurately represent LFG concentrations).

3.5 Standards for LFG

Standards for methane in LFG are based on the Lower Explosive Limit (LEL) of methane in air (i.e., 5%). The MECP guidance document “*D-4-1 Assessing Methane Hazards from Landfill Sites*” (July 2021) indicates that where studies are available that demonstrate that methane is not present in the landfilled waste at a concentration greater than 20% LEL (i.e., 1% methane in air), it can be assumed that methane from that landfill is not present on adjacent properties at a higher concentration. Accordingly, an action level of 1% methane at wells outside of the waste is used to identify areas requiring further assessment.

3.6 Gas Probe / Well Decommissioning (GP-B1/MW-B1)

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.

In late September 2024, ground fires were identified to have occurred within close proximity to gas probe GP-B1 and monitoring well MW-B1. Inspection of these wells indicated that the heat from the fires melted the inner well casing. As the damaged wells were not considered to be repairable, they were decommissioned on November 28, 2024, as per Ontario Regulation 903 (well decommissioning logs are provided in **Appendix F**). Pending the outcome of discussions between the City and the Ministry regarding the need for further monitoring of LFG in this area, if necessary, these wells could be replaced at a location further north (refer to Section 6.3).

4 GROUNDWATER AND SURFACE WATER RESULTS

4.1 Groundwater Elevations and Flow

A summary of groundwater elevations obtained from the monitoring wells and gas probes is provided in **Table B-1 (Appendix B)**. Groundwater elevations ranged from 219.52 m above sea level (asl) (at GP-B7) to 224.72 m asl (at GP-B20) in February 2024 and from 219.20 m asl (at GP-B7) to 224.82 m asl (at GP-B20) in September 2024, which are relatively consistent with the data from previous years. In general, and as expected, water levels were lower during the Fall event than in the Spring event. At some locations, the water table was below the screened interval (i.e., the well was dry).

Figure 3 illustrates the groundwater flow directions based on water levels obtained in February 2024.

Groundwater flow is interpreted to be easterly overall but flows locally to the topographic low formed by Bunker's Creek. At Site 1, shallow groundwater flow is interpreted to be toward Bunker's Creek. Groundwater originating from the waste fill areas flows away from adjacent properties located outside the estimated waste limits. At Site 2, shallow groundwater is interpreted to be toward Milligan's Pond or Bunker's Creek in the northern portion of the Site, north of the creek and north-easterly toward Bunker's Creek to the south of the 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.

At Sites 3 and 7, shallow groundwater flow is interpreted to be largely north toward Bunker's Creek; however, in the area of Site 7, it is expected that a portion of the groundwater flows off-site to the adjacent property to the east, before discharging to Bunker's Creek near monitoring well MW-B7.

4.2 Analytical Results

The sampling event took place a minimum of 72 hours following a significant rainfall event to ensure the results are typical of baseflow conditions.

No leachate seeps (i.e., evidently discolored water on the stream banks) were noted during the sampling events. The analytical results for surface water samples were compared to the respective PWQO for surface water and are summarized in **Tables 3 through 5** 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** for informational purposes, as this parameter represents a potential impact to aquatic organisms. Laboratory Certificates of Analysis for surface water are provided in **Appendix C**.

4.2.1 VOC, Metals, Major Ions, PHC and PAH

Surface water quality in samples collected from five locations along Bunker's Creek (see **Figure 4**) met the PWQO for the analyzed parameters, with the following exceptions:

- **Iron at all sampling locations**, ranging in concentration from 279 micrograms per litre (µg/L) (SWB5 – the upstream location) to 784 µg/L (SWB4 – the downstream location from Site 1, downstream of SW5). The iron concentration reported for SWB1 (710 µg/L), the downstream sample location, was similar to previous values.

Phosphorus concentrations were first analyzed and reported in 2023 and were slightly above the interim PWQO (0.030 milligrams per litre [mg/L]) at all sampling locations. The results of samples collected in 2024 were below the PWQO, ranging from 0.010 mg/L (SWB5) to 0.022 mg/L (SW3 and SW4).

Total ammonia, a common indicator of municipal solid waste impact, was present at low concentrations, ranging from non-detect to 0.4 mg/L in 2024, consistent with previous results. The un-ionized ammonia proportion (indicative of potential impacts to aquatic organisms) was calculated based on field pH and temperature at the time of sampling and was below the PWQO of 0.02 mg/L in all cases. This parameter ranged from non-detect at SWB5 (upstream) to 0.005 mg/L at SWB2 and SWB1 (Innisfil and Bradford Streets, respectively, the two most downstream samples).

No elevated VOC or PHC parameters were detected in 2024.

Surface water is the ultimate receptor for groundwater discharging from the waste sites. Based on the surface water laboratory indicator results obtained as part of the 2024 monitoring program, it is concluded that the waste fill is not adversely affecting the surface water quality of Bunker's Creek relative to the PWQO.

4.2.2 Indicator Parameters

Relative comparisons can be made regarding general water quality for parameters such as electrical conductivity (1,640 micro Siemens per centimetre [$\mu\text{S}/\text{cm}$] to 1,860 $\mu\text{S}/\text{cm}$) and chloride (520 mg/L to 600 mg/L). These parameters are generally considered to reflect run off impacted from road salting activities on nearby roadways throughout the winter.

The concentrations of the indicator parameters are generally similar in all surface water samples. This supports the conclusion that the waste fill sites are not adversely impacting the quality of Bunker's Creek relative to PWQO.

4.2.3 Quality Assurance/Quality Control

The Relative Percent Differences (RPD), where able to be calculated, for the duplicate surface water samples collected in 2024 are within acceptable ranges.

Concentrations of analyzed parameters in the field blank sample were less than their respective laboratory detection limits, except select low level metal and inorganic parameters (typically within 5 times the Reportable Detection Level (RDL), where variability is highest) in the field blanks prepared in 2024, which is not unexpected as the blank water is not de-ionized. A concentration of dissolved aluminum 14 $\mu\text{g}/\text{L}$ was detected in the field blank, higher than the concentrations reported in the samples, indicating that the elevated reading does not affect the overall findings of the report.

Concentrations of analyzed parameters in the trip blank samples were less than their respective laboratory detection limits. The laboratory indicated that they found no discrepancies or any errors in the data reported. The field sampling protocols were followed and there were no exceedances of the PWQO for these parameters. Based on the detected results, the results of the blank sample analyses are considered acceptable.

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.

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.

Based on the review of the 2024 QA/QC data, the associated analytical results are considered to be representative and reproducible.

5 LANDFILL GAS RESULTS

Figure 5 provides a plan-view of the highest methane gas concentrations measured in gas probes in February 2024, which was under frozen ground conditions. All the gas probes are located outside of the waste fill area at the Bunker's Creek Landfills. In some cases, the gas probe screens were nearly submerged (i.e., at GP-B7, GP-B18, and GP-B19), which reduces the ability of the probe to represent accurate landfill gas concentrations.

Table 3 provides a summary of 2024 methane gas concentrations. Historical LFG monitoring results are provided on **Table 7** following the text of the report. There are no data for GP-B1 in September 2024 as this well was damaged prior to the fall sampling program (refer to Section 6.3).

Methane concentrations above the LEL of 5% in air represent a potential safety hazard at adjacent buildings, as the gas can potentially accumulate within enclosed spaces and result in conditions where open flame or a spark could cause an explosion. As per MECP guidance, a methane concentration of 1% is used herein as an action level to identify results which require further assessment.

The maximum concentration of methane detected in the monitored probes in 2024 was 0.3%, below the action level of 1%; most results were non-detect. It is noted that there are no probes north of Sites 3 and 7, where lands are under private ownership; however, the presence of Bunker's Creek at this location would act as a natural barrier to LFG migration in this direction.

Table 3: Summary of 2024 Methane Concentrations – Bunker's Creek Landfills

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)
Site 1					
GP-B1	1.26 – 2.78	Within the fill overlying waste	22-Feb-24	Dry	0.0
			19-Sep-24	Damaged	Not sampled
GP-B8	0.91 – 3.93	Within the waste fill limits overlying sand	22-Feb-24	3.43	0.0
			19-Sep-24	3.48	0.0
GP-B20	1.52 – 4.57	Sand	22-Feb-24	3.71	0.0
			19-Sep-24	3.61	0.0
GP-B21	1.07 – 4.12	Unknown (daylighted)	22-Feb-24	Dry	0.0
			19-Sep-24	Dry	0.0
GP-B22	0.76 – 3.81	Sand	22-Feb-24	1.95	0.0

Location	Screen Interval (mbgs)	Screen Installation Description	Date	Depth to Groundwater (mbgs)	Methane Concentration (% by volume)
			19-Sep-24	2.08	0.0
GP-B24	0.80 – 2.27	Within waste fill area	22-Feb-24	1.50	0.0
			19-Sep-24	1.62	0.0
Site 2					
GP-B3	0.61 – 2.13	Within the fill overlying waste	22-Feb-24	Dry	0.0
			19-Sep-24	Dry	0.0
Site 3					
GP-B14	0.77 – 3.05	Sand	22-Feb-24	1.75	0.0
			19-Sep-24	2.03	0.0
GP-B17	1.22 – 2.75	Sand	22-Feb-24	2.41	0.0
			19-Sep-24	2.69	0.2
			24-Sep-24	2.70	0.3
Site 7					
GP-B7	0.77 – 2.29	Sand, some silt and gravel	22-Feb-24	0.82	0.0
			19-Sep-24	1.14	0.0
GP-B18	1.52 – 3.05	Sand	22-Feb-24	1.57	0.0
			19-Sep-24	1.87	0.3
			24-Sep-24	1.87	0.3
GP-B19	0.77 – 2.29	Unknown (daylighted)	22-Feb-24	0.76	0.0
			24-Sep-24	0.95	0.3

6 DISCUSSION AND SUMMARY

6.1 Surface Water Quality

The sampling event took place a minimum of 72 hours following a significant rainfall event to ensure the results are typical of baseflow conditions.

The overall results for ammonia have not substantively changed from those of previous years. The un-ionized ammonia proportion (indicative of potential impacts to aquatic organisms) was below the PWQO of 0.02 mg/L in all cases indicating that discharge of ammonia from the landfills to the stream as baseflow is limited. The total ammonia results are consistent with historical trends, which indicate a moderate increase of ammonia at the downstream location, presumably attributable to landfill influence.

No PAH were detected at any surface water locations in 2022, 2023 or 2024. Occasional detections of PAH have been inconsistently observed at some stream sampling locations, most recently in 2021 at most locations, but at low concentrations. In 2015, a number of PAH exceeded the PWQO at SWB3. Detections of low concentrations of PAH noted in 2020 and/or 2021, included fluorene, phenanthrene fluoranthene and pyrene; notably fluoranthene concentrations exceeded the PWQO at some locations. It is also noted that the laboratory reportable detection limits for a number of PAH are above the PWQO. Overall, PAH do not provide consistent evidence of impact from the waste sites to Bunker's Creek.

Elevated concentrations of iron above the PWQO are not considered to indicate landfill related impacts. Iron concentrations in the upstream location (SWB5) range from a maximum concentration of 1,650 ug/L in 2023 to a minimum concentration of 279 ug/L in 2024. Iron concentrations in the downstream location (SWB1) range from a maximum concentration of 2,500 ug/L in 2021 to a minimum concentration of non-detect in 2023. Concentrations of a number of metal parameters fluctuate over time however, the relative trends do not indicate an immediate issue requiring action beyond ongoing sampling and assessment described herein.

The results of phosphorus samples collected in 2024 were below the PWQO, ranging from 0.010 mg/L (SWB5, the upstream location) to 0.022 mg/L (SW3 and SW4, located within Site 2). The downstream location remained below the PWQO (0.020 mg/L) and not substantially higher than that noted at SWB5. The source of phosphorous to stormwater runoff into urban areas is reported to include atmospheric deposition, fertilizers, pet waste, automotive detergents and decay of organic material from lawn clippings and leaves¹. The relative trends do not indicate actions required beyond ongoing sampling and assessment described herein.

Surface water is the ultimate receptor for potential groundwater impacts from the historical waste sites. Based on the surface water results obtained during this investigation during the 2024 sampling event, it is concluded that the historic waste sites are not adversely affecting surface water quality of Bunker's Creek. Whereas there are seasonal variations of a number of parameters monitored in Bunker's Creek, a number of these reflect urban runoff rather than landfill related influence. Given the historic sampling record and recent results, sampling of the creek annually in the early fall (i.e., September) is considered to be sufficient.

6.2 Off-Site Landfill Gas

The measured concentrations of LFG in 2024 at all gas probes located adjacent to waste fill areas ranged from non-detect to 0.3% and are below the 1% action level. Following damage to GP-D1, no data is available in the

¹ Stormwater runoff driven phosphorous transport in an urban residential catchment: Implications for protecting water quality in urban watersheds by Yun-Ya Yang and Gurpal S. Toor. Published August 3, 2018 at <https://www.nature.com/articles/s41598-018-29857-x>

north portion of Site. As noted below, historical information for this well indicates that methane has not been present at this probe since 2012.

Whereas continued LFG monitoring adjacent to Sites 1, 2, 3 and 7 is warranted to ensure conditions do not change, the risk posed to nearby residences from elevated methane in soil gas is not anticipated to increase over time. The waste has been in place for over 50 years and therefore LFG generation is expected to decline slowly. Monitoring of LFG in probes located within the waste is not considered necessary as sufficient historical information on the source area of methane has been collected. Provided that other controlling conditions, for example water table elevation and permeability of the soil / ground cover do not change substantively, methane concentrations are expected to be within the range of recent results. Should future development be considered in the areas where elevated methane is present (i.e., within the waste fill area), additional investigations would be required.

6.3 Conditions in North Site 1 and Requirement for GP-B1

Decommissioning of GP-B1 and MW-B1 is required under Ontario Regulation 903 as these wells are damaged beyond repair. It is noted that access for sampling of GP-B1 has been challenging in recent year as a result of an unauthorized encampment located south of Boys Street.

The historical results at GP-B1 indicate that since 2012, no appreciable concentration of methane has been detected (typically non-detect with occasional maximum of 0.1%. The only enclosed structures in the immediate vicinity of GP-B1 are City-owned; Earlier investigations of Site 1 (Golder, 2013) indicate that the area north of Site 1 is not at significant risk from LFG migration.

The investigation of Site 1 included the completion of several test pits and boreholes. The results indicated that waste material within the north part of Site 1 (i.e., in the vicinity of MW/GP-B1) consists of construction debris (BH-A3, BH-A5, BH-B1 and BH-B2). Minor amounts of moderately degradable waste such as wood and paper were recorded at one borehole (MW/GP-B1). Copies of the borehole logs for the locations drilled as part of the April 2013 investigations are provided in **Appendix E**.

A geological cross section of Site 1 is provided in **Appendix E**. The cross section demonstrates the depth of waste throughout Site 1 as well as the groundwater levels and elevation of Bunker's Creek. Bunker's Creek is observed to flow continuously in the area of Site 1 and therefore acts as a hydraulic barrier to LFG migration from other parts of the waste fill (i.e., south of Bunker's Creek) within Site 1.

The average depth of the waste in Site 1 north of Bunker's Creek is 3 m (including daily cover) based on borehole logs in the area. This portion of Site 1 is accordingly estimated to contain approximately 15,000 cubic metres (m³) of fill which is largely inert.

Given the available information, it is concluded that potential for methane generation and migration from the north part of Site 1 is low. Monitoring of LFG in this area indicates methane values well below the 10% LEL value (1%) provided in the D-4-1 guideline relative to potential threat of LFG impacting enclosed spaces.

6.4 Summary

The primary findings based on the 2024 monitoring program results are as follow:

- Surface water quality remains stable in comparison to historical data. Surface water is the ultimate receptor for potential groundwater impacts from the historical waste sites. Based on the results obtained during this

investigation during the 2024 sampling event, it is concluded that the historic waste sites are not adversely affecting surface water quality of Bunker's Creek;

- Polycyclic aromatic hydrocarbons (PAH) were not detected at any surface water locations in 2024, consistent with 2022 and 2023 results. Whereas occasional detections of PAH have been inconsistently observed, the data indicates stable trends;
- During the 2024 monitoring program, one gas probe (GP-B1) and an adjacent monitoring well (MW-B1) were irreparably damaged as a result of a fire from a nearby encampment and could not be monitored. Decommissioning of this well is required under Ontario Regulation 903;
- The methane concentrations measured in 2024 at gas probes located adjacent to waste fill areas 1, 2,3 and 7 ranged from non-detect to 0.3% and are below the 1% action level at all locations. Following damage to GP-B1 there is no data available for the area in the north portion of Site 1 however, historical data indicates that methane has not been present at this probe since 2012;
- The north part of Site 1 contains an estimated volume of 15,000 m³ of inert fill including concrete and asphalt (e.g., asphalt, concrete). This part of the site is separated from the south part by Bunker's Creek, which acts as a hydraulic barrier to landfill gas migration from the area south of the creek.

7 REFERENCES

Golder Associates Ltd., 2013. D-4 Study and Environmental Assessment, Bunker's Creek Landfills – City of Barrie. Report prepared for the City of Barrie dated April 2013.

Ministry of Environment and Energy, 1994. *Provincial Water Quality Objectives*, dated July 1994.

Ministry of Environment, Conservation and Parks, 2021. D-4-1 Assessing Methane Hazards from Landfill Sites. Dated May 18, 2016, amended July 13, 2021.

WSP Canada Inc., 2024. Bunker's Creek Historic Waste Sites, 2023 Annual Monitoring Report. Report prepared for the City of Barrie dated January 26, 2024.

Yang & Toor, 2018. *Stormwater runoff driven phosphorous transport in an urban residential catchment: Implications for protecting water quality in urban watersheds*. Authored by Yun-Ya Yang and Gurpal S. Toor. Published August 3, 2018 at <https://www.nature.com/articles/s41598-018-29857-x>.

8 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.

WSP's professional services for this assignment addressed only the geo-environmental (chemical and soil gas) aspects of the subsurface conditions at this site. The 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 WSP and is based solely on-site conditions encountered at the time of the field work (i.e., 2024), as described in this report.

In evaluating the site, WSP 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. WSP 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, WSP should be requested to re-evaluate the conclusions presented in this report and provide amendments as required.

Signature Page

WSP Canada Inc.



Christi Groves, B.Sc.(Hons)
Principal, Senior Env. Scientist

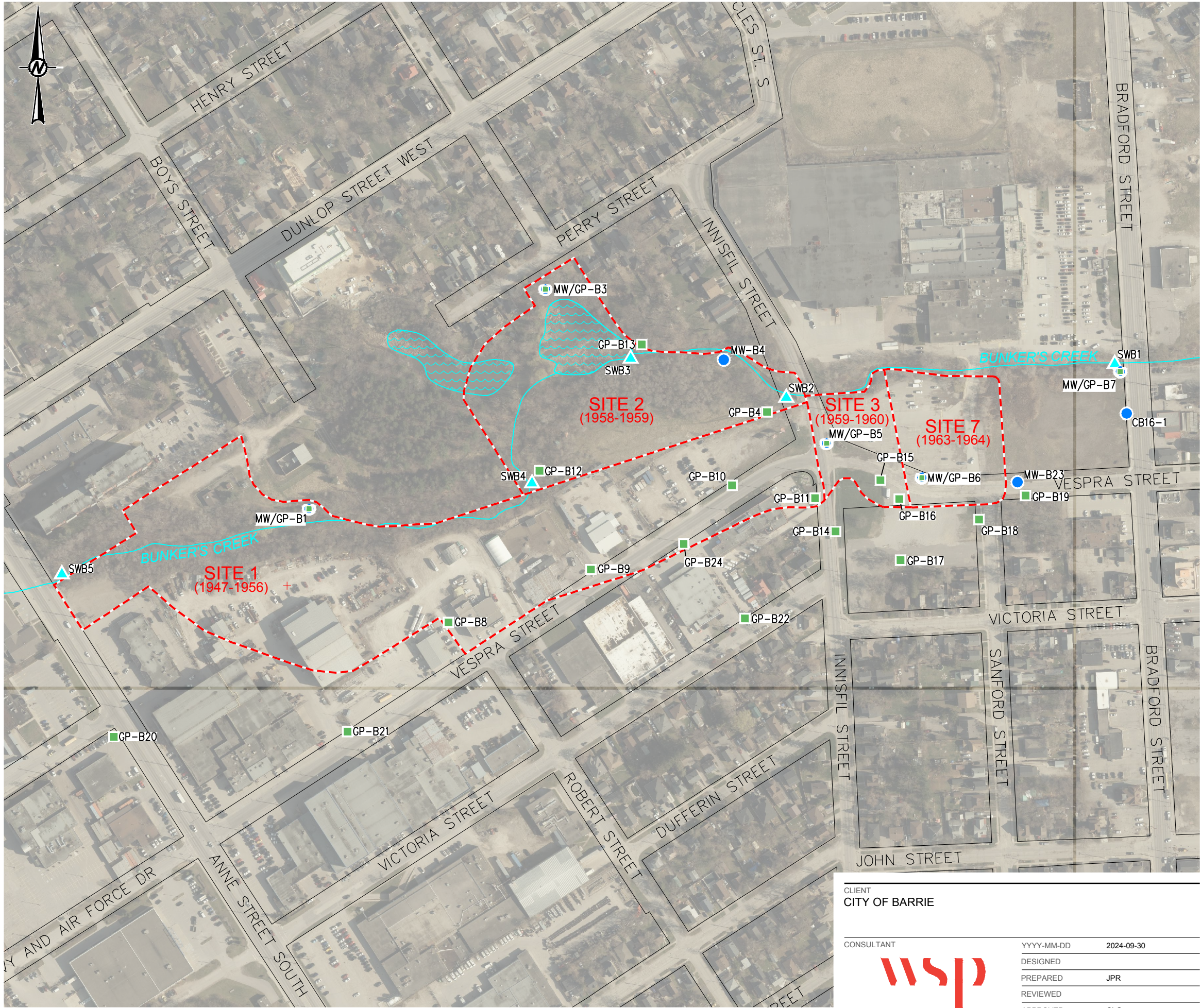


Paul Dewaele, M.Sc., P.Eng.,
Senior Geo-Env. Engineer Northern Geo Environmental Ltd.

CLG/DEV/PJD/ms

Figures

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LEGEND:

- Estimated Waste Limit
- Gas Probe
- Monitoring Well
- Monitoring Well / Gas Probe
- Surface Water Sampling Location

- NOTES:**
- Datum is NAD83 Zone 17
 - All Mapped Boundaries, Limits, and Interpolated Features are Approximate
 - CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
 - Image City of Barrie 2022, Site Features are Approximate to Orthographic Alignment

PROJECT
BUNKER'S CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

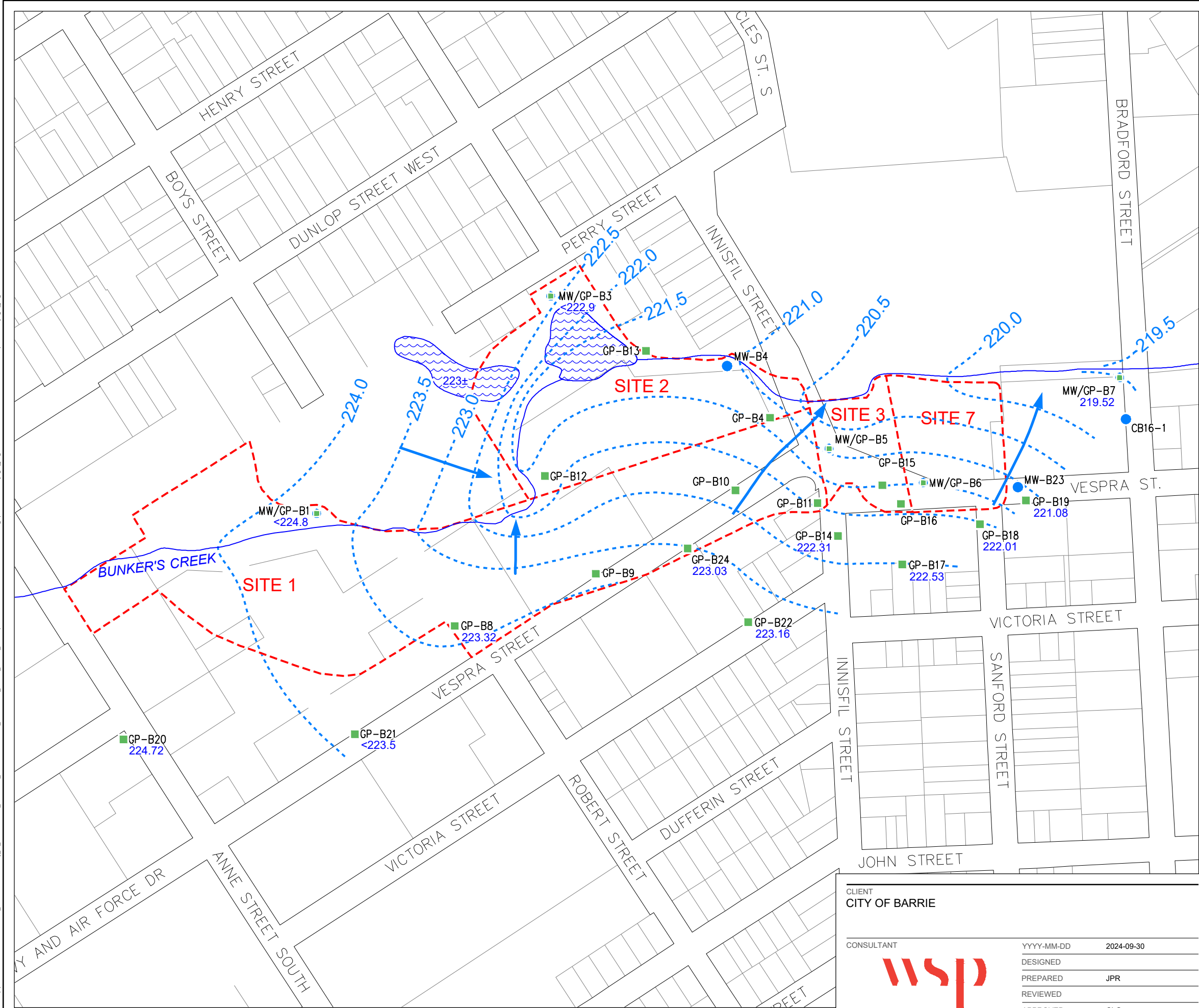
TITLE
SAMPLING LOCATION MAP

PROJECT NO. 23592540	CONTROL 0003	REV. ---	FIGURE 2
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CLIENT CITY OF BARRIE	YYYY-MM-DD 2024-09-30
CONSULTANT 	DESIGNED JPR
	PREPARED JPR
	REVIEWED CLG
	APPROVED CLG

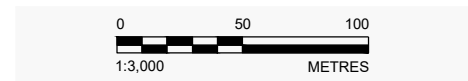
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B

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LEGEND:

- Estimated Waste Limit
- Interpolated Equipotential Line
- Interpolated Groundwater Flow Direction
- Shallow Static Water Elevation (masl)
- Gas Probe
- Monitoring Well
- Monitoring Well / Gas Probe



- NOTES:**
- Datum is NAD83 Zone 17
 - Mapped Boundaries, Limits, & Interpolated Features are Approximate
 - CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
 - Shallow Static Water Elevations Monitored February, 2024

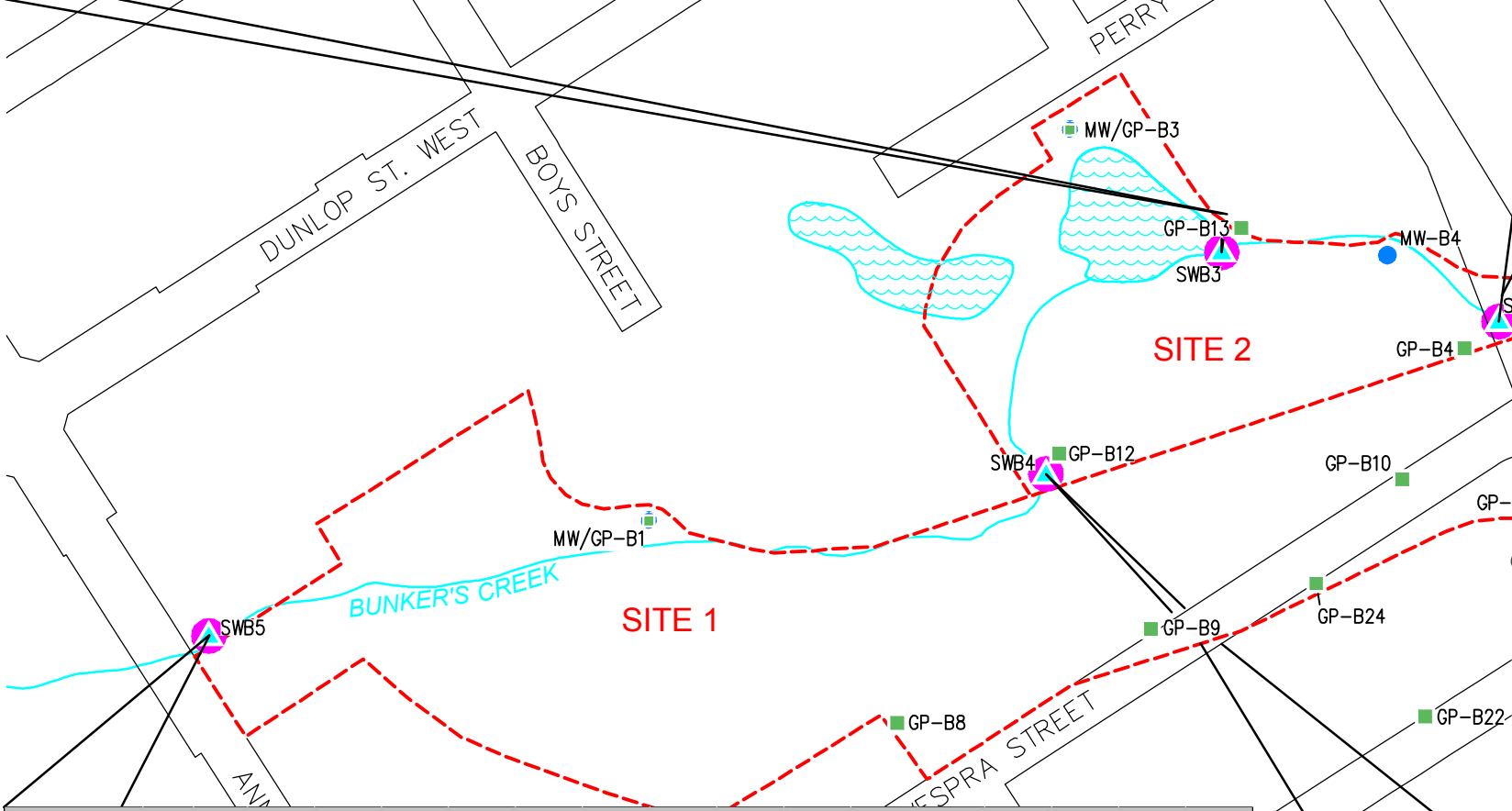
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CONSULTANT 		TITLE GROUNDWATER ELEVATIONS FEBRUARY 2024	
YYYY-MM-DD DESIGNED PREPARED REVIEWED APPROVED	2024-09-30 JPR CLG	PROJECT NO. 23592540	CONTROL 0003 REV. --- FIGURE 3

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

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SWB3																	
Parameter	Units	PWQO	Results														
			Aug-13	Dec-13	Nov-14	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Apr-22	Sep-22	Apr-23	Aug-23	Sep-24
Metals																	
Copper	µg/L	5	6.9	3.2	<2.5	<0.5/<0.5	2.2	<0.5	1.7	1.0	1.4/1.3	2.3	1.3/1.4	2.2	1.9	3.2/3.4	<1/<1
Vanadium	µg/L	6	0.8	3.4	<2.5	<0.5/1.7	1.0	0.7	0.9	0.9	1.2/1.0	2.0	0.90/0.85	1.2	0.91	1.49/1.49	0.70
Polynuclear Aromatic Hydrocarbons																	
Phenanthrene	µg/L	0.03	<0.05	<0.05	<0.05	0.16/0.13	<0.05	<0.05	<0.05	<0.05	<0.03/<0.03	0.011	<0.030/<0.030	<0.030	<0.1	<0.1/<0.1	<0.1/<0.1
Anthracene	µg/L	0.0008	<0.05	<0.01	<0.01	0.02/0.02	<0.01	<0.01	<0.01	<0.01	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.1	<0.1/<0.1	<0.1/<0.1
Fluoranthene	µg/L	0.0008	0.09	<0.01	<0.01	0.33/0.33	<0.01	<0.01	<0.01	<0.01	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.1	<0.1/<0.1	<0.1/<0.1
Benzo[a]anthracene	µg/L	0.0004	<0.05	<0.01	<0.01	0.10/0.09	<0.01	<0.01	<0.01	<0.01	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.1	<0.1/<0.1	<0.1/<0.1
Chrysene	µg/L	0.0001	<0.05	<0.05	<0.05	0.19/0.16	<0.05	<0.05	<0.05	<0.05	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.1	<0.1/<0.1	<0.1/<0.1
Benzo[k]fluoranthene	µg/L	0.0002	<0.05	<0.05	<0.05	0.13/0.13	<0.05	<0.05	<0.05	<0.05	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.1	<0.1/<0.1	<0.1/<0.1
Benzo[ghi]perylene	µg/L	0.00002	<0.05	<0.05	<0.05	0.14/0.14	<0.05	<0.05	<0.05	<0.05	<0.05/<0.05	<0.010	<0.050/<0.050	<0.050	<0.2	<0.2/<0.2	<0.2/<0.2
Landfill Tracer Parameters																	
Iron	µg/L	300	1200	1420	1100	391/1390	1100	742	995	1100	800/800	1300	960/950	870	979	1230/1300	697/708
Phosphorus	mg/L	0.030 (interim)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053/0.055	0.021/0.022
Unionized Ammonia	mg/L	0.02	<0.001	0.001	0.011	0.012/0.012	0.011	0.005	0.004	0.011	0.012/0.013	0.016	0.014/0.012	0.005	0.004	0.005/0.004	0.003/0.003

SWB2																	
Parameter	Units	PWQO	Results														
			Aug-13	Dec-13	Nov-14	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Apr-22	Sep-22	Apr-23	Aug-23	Sep-24
Metals																	
Copper	µg/L	5	5.3	2.8	<2.5	<0.5	1.2/1.3	<0.5	3.1	1.1	3.2	3.1	6.0	1.6	2.4	4.2	<1
Lead	µg/L	5	0.83	0.8	0.7	0.7	10.3/<0.1	0.3	0.2	<0.5	<0.5	2.8	3.4	<0.50	0.10	1.19	0.11
Zinc	µg/L	30	14	11	<25	8.0	6/6	<5	6.0	5.9	9.2	8.0	31	<5.0	4.0	14	2.0
Vanadium	µg/L	6	0.5	2.3	<2.5	0.8	0.7/0.8	0.7	0.7	0.87	1.1	3.0	2.6	0.97	0.81	1.5	0.70
Polynuclear Aromatic Hydrocarbons																	
Fluoranthene	µg/L	0.0008	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01/<0.01	<0.01	<0.050/<0.050	<0.050	0.011	<0.050	<0.050	<0.1	<0.1	<0.1
Landfill Tracer Parameters																	
Iron	µg/L	300	731	1030	993	745	553/606	712	613	820	900	1900	2200	820	1020	1280	708
Phosphorus	mg/L	0.030 (interim)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053	0.022
Unionized Ammonia	mg/L	0.02	<0.001	0.001	0.016	0.013	0.010/0.010	0.004	0.004	0.011	0.012	0.017	0.007	0.007	0.003	0.005	0.005



SWB5																	
Parameter	Units	PWQO	Results														
			Aug-13	Dec-13	Nov-14	Sep-15	Sep-16	Sep-17	Sep-18	Sep-19	Sep-20	Sep-21	Apr-22	Sep-22	Apr-23	Aug-23	Sep-24
Metals																	
Copper	µg/L	5	10	1	<2.5	<0.5	0.8	<0.5	1.1	<1.0	<0.9	1.8	1.6	3.0	1.5/1.8	2.5	<1
Vanadium	µg/L	6	0.8	4.2	<2.5	0.9	0.9	0.9	1.0	1.1	1.1	2.3	1.4	1.3	0.97/1.09	1.1	0.80
Polynuclear Aromatic Hydrocarbons																	
Fluoranthene	µg/L	0.0008	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.050/<0.05	<0.050	<0.010	<0.050	<0.050	<0.1	<0.1	<0.1
Landfill Tracer Parameters																	
Iron	µg/L	300	605	5110	1040	586	431	564	521	470	630	950	730	440	1120/407	1650	279
Phosphorus	mg/L	0.030 (interim)	-	-	-	-	-	-	-	-	-	-	-	-	-	0.042	0.010
Unionized Ammonia	mg/L	0.02	<0.001	0.001	0.006	0.005	0.003	0.002	0.001	0.003	0.007	0.009	0.002	0.005	0.001/<0.00	0.002	<0.002

LEGEND:



- Estimated Waste Limit
- Gas Probe
- Monitoring Well
- Monitoring Well / Gas Probe
- Surface Water Sampling Location
- < PWQO (2024 Samples)
- >PWQO (2024 Samples)
- Exceedance of PWQO

NOTES:

- Datum is NAD83 Zone 17
- All Mapped Boundaries, Limits, and Interpolated Features are Approximate
- CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
- PWQO = Provincial Water Quality Objectives, July 1994
- Flagged Location Exceedance relative to Sampling 2024

CLIENT
CITY OF BARRIE

CONSULTANT



YYYY-MM-DD 2024-09-30

DESIGNED

PREPARED JPR

REVIEWED

APPROVED CLG

PROJECT
BUNKER'S CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE

SURFACE WATER RESULTS

PROJECT NO.
23592540

CONTROL
0003

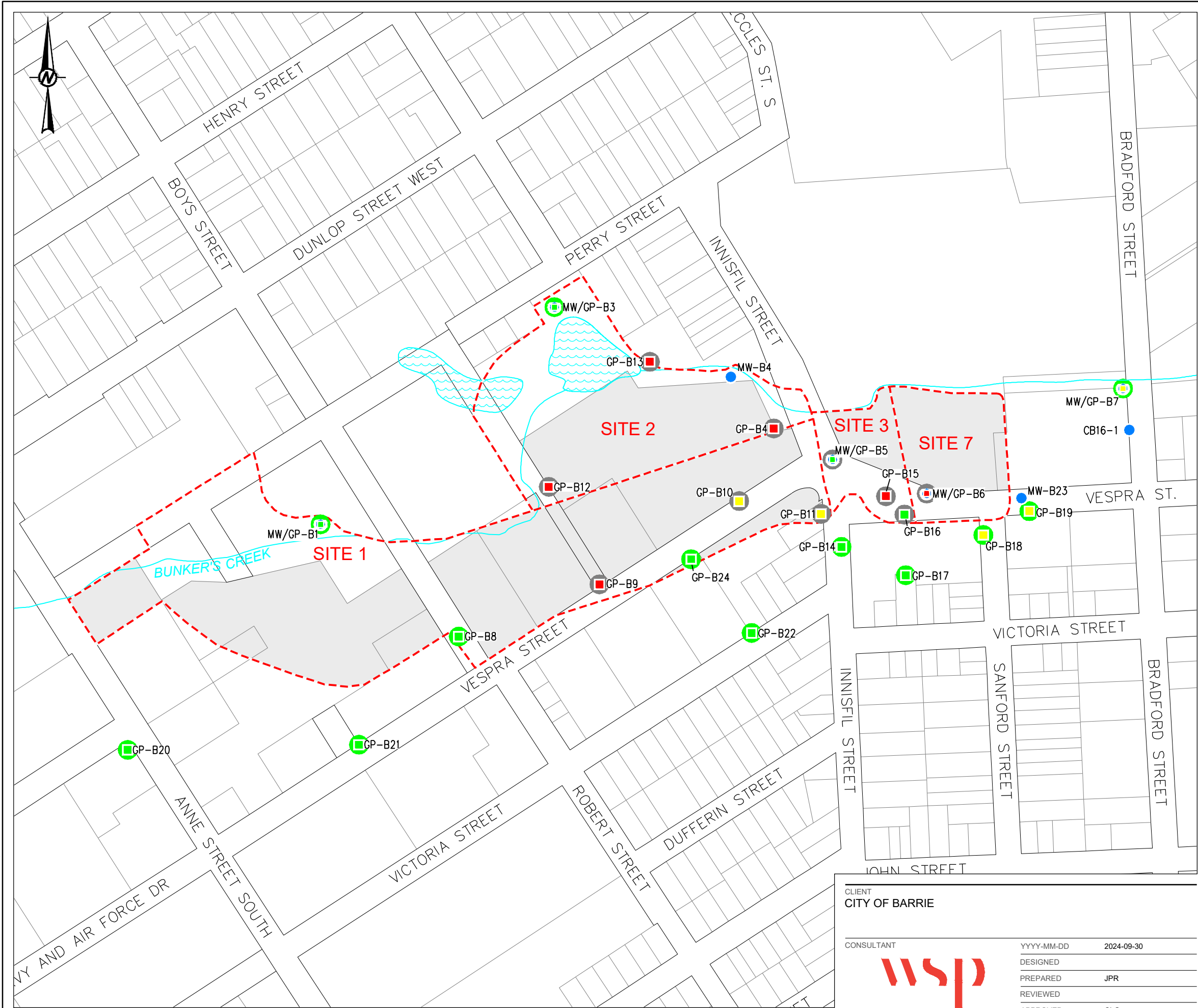
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FIGURE

4

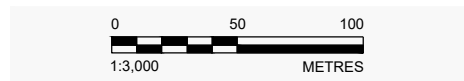
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LEGEND:

- Estimated Waste Limit
- 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%)
- <1% Methane Gas Concentration
- 1% - 4.9% Methane Gas Concentration
- >5.0% Methane Gas Concentration
- Methane Gas Concentration Not Monitored
- Privately Owned Property



- NOTES:**
- Datum is NAD83 Zone 17
 - All Mapped Boundaries, Limits, and Features are Approximate
 - CAD Base Digital 1:2000 Municipal Mapping Courtesy City of Barrie
 - Readings Represent Highest Reading(s) Sampling Events 2024

CLIENT
CITY OF BARRIE

CONSULTANT



YYYY-MM-DD 2024-09-30

DESIGNED

PREPARED JPR

REVIEWED

APPROVED CLG

PROJECT
BUNKER'S CREEK HISTORICAL LANDFILL
2024 ANNUAL MONITORING REPORT

TITLE
METHANE GAS CONCENTRATIONS

PROJECT NO. 23592540	CONTROL 0003	REV. ----	FIGURE 5
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25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

Tables

Table 4
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Bunker's Creek Historical Waste Sites

Monitoring Well Location				SWB1																			
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	15-Sep-17	07-Sep-18	05-Sep-19	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO									Field Duplicate of SWB1			Field Duplicate of SWB1					Field Duplicate of SWB1			
Dissolved Metals																							
Aluminum-dissolved	µg/L	1	75	<4	40	40	8	4	<1	4	2	<1	<1	<5	<5	6	15	<5	7	10	9	5	3
Aluminum (total)	µg/L	1	NO	-	-	80	-	-	34	-	-	-	-	24	21	39	1200	25	30	25	2	139	13
Antimony	µg/L	0.9	20	<3	<0.5	0.2	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9
Arsenic	µg/L	0.2	100	<3	<1	0.3	<1	<5	<1	2	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	< 0.2	0.3	< 0.2
Barium	µg/L	0.08	NO	116	140	163	138	160	166	170	153	159	135	160	160	160	160	160	150	140	0.74	143	171
Beryllium	µg/L	0.007	11	<1	<0.5	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.40	<0.40	<0.40	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	µg/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	< 0.01
Boron	µg/L	2	200	13	10	19	21	<50	38	24	23	22	15	26	26	20	23	19	21	20	< 2	20	22
Cadmium	µg/L	0.003	0.2	<0.1	<0.1	0.13	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.003	0.011	0.003
Chromium	µg/L	0.08	NO	14	3	3.3	8	<5	<1	1	<1	<1	<1	<5	<5	<5	<5.0	<5.0	<5.0	<5.0	0.19	1.5	0.40
Cobalt	µg/L	0.004	0.9	<0.5	0.4	0.2	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5	<5	<0.5	0.9	<0.50	<0.50	<0.50	0.006	0.211	0.110
Copper	µg/L	1	5	<2	2	9.1	4.8	<2.5	<0.5	1	<0.5	<0.5	0.9	<1	<1	1.6	4.3	1.2	1.5	1.5	1.0	1.6	< 1
Iron	µg/L	7	300	884	1110	675	1480	1190	448	565	682	692	620	790	800	880	2500	930	850	850	< 7	1070	710
Lead	µg/L	0.09	5	1	<1	2.07	1.7	1	<0.1	<0.1	0.2	0.2	0.1	<0.5	<0.5	<0.50	4	<0.50	<0.50	<0.50	< 0.09	0.72	< 0.09
Total Lithium (Li)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	<5.0	<5.0	<5.0	<5.0	0.2	2.4	0.40
Manganese	µg/L	0.0	NO	73	110	77	100	118	51	38	47	48	46	54	54	62	140	86	69	69	0.24	66.8	39.0
Molybdenum	µg/L	0.40	40	<2	<5	0.8	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.64	0.71	<0.50	0.59	0.57	< 0.04	0.66	0.40
Nickel	µg/L	0.10	25	<3	<5	<10	4	<5	<1	<1	<1	<1	<1	<1	<1	<1.0	2.2	<1.0	<1.0	<1.0	< 0.1	1.2	0.50
Selenium	µg/L	0.04	100	<4	<1	<1	<1	<5	<1	1	<1	<1	<1	<2	<2	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.04	0.280	0.271
Total Silicon (Si)	µg/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	-	4900	7200	4500	5000	5000	< 20	4940	5060
Silver	µg/L	0.05	0.1	<0.1	<0.1	0.02	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05
Strontium	µg/L	0.08	NO	432	607	490.000	454	611	503	436	482	496	412	460	460	490	620	690	590	590	1.08	545	529
Total Tellurium (Te)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.050	-	< 0.005	< 0.005
Total Tin (Sn)	µg/L	0.06	NO	-	-	-	-	-	<5	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	< 0.06
Titanium	µg/L	0.10	NO	2	<10	<5	<5	<25	<5	<5	<5	<5	<5	<5	<5	7.6	57	<5.0	<5.0	<5.0	0.06	7.26	0.60
Tungsten	µg/L	0.02	30	<10	<5	20	<0.01	<50	<10	<10	<10	<10	<10	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.02	0.14	0.045
Uranium	µg/L	0.00	5	<2	1	1.1	0.9	1.3	0.3	0.9	1.0	1	0.9	0.96	0.95	0.99	1.6	1.1	0.97	0.93	0.004	0.769	0.90
Vanadium	µg/L	0.01	6	5	1	0.4	2.7	<2.5	<0.5	0.5	0.5	0.5	0.6	0.82	0.83	1.0	4.0	0.82	0.92	0.93	0.020	1.49	0.60
Zinc	µg/L	2	30	6	<10	15	15	<25	<5	6	<5	<5	6	<5	<5	5.5	11	<5.0	<5.0	5.9	< 2	13	2.0
Zirconium	µg/L	2	4	<4	<2	<3	<1	<5	<1	<1	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	-	< 2
Dissolved Mercury	µg/L	0.01	0.2	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	-	<0.10	<0.10	< 0.01	< 0.01	< 0.01
Inorganics																							
Electrical Conductivity	uS/cm	2	NO	1450	2150	1400	2110	3120	1780	1700	1790	1820	1880	1900	1900	2000	1800	2500	2000	2000	2320	1610	1850
pH	No unit	0.05	6.5:8.5	8.33	7.96	7.70	7.68	7.52	7.89	7.98	7.58	7.65	7.69	8.14	8.14	8.16	8.23	8.17	8.10	8.05	8.21	8.03	8.19
Total Hardness (as CaCO3)	mg/L	0.05	NO	359	389	340	428	368	387	348	388	389	347	450	460	360	360	390	350	350	-	322	367
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	263	267	264	279	262	272	258	286	272	255	270	270	270	250	280	240	240	257	217	247
Chloride	mg/L	0.04	NO	343	511	312	467	630	385	413	366	372	375	420	420	430	410	650	430	440	590	440	520
Sulphate	mg/L	0.04	NO	28.8	32	30	30	40	30	34.6	29.7	31.3	30.4	28	28	27	28	39	26	29	43	21	26
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.048	0.020
Ammonia as N	as N mg/L	0.10	NO	-	0.72	0.29	0.96	0.85	0.50	0.44	0.47	0.47	0.51	0.52	0.56	0.55	0.53	0.54	0.49	0.51	0.50	0.30	0.40
Unionized Ammonia (calculated)	mg/L as N		0.02	-	0.005	0.001	<0.001	0.020	0.010	0.018	0.006	0.006	0.007	0.015	0.016	0.023	0.025	0.011	0.009	0.010	0.004	0.007	0.005
Calcium	µg/L	10	NO	120000	131000	123000	145000	125000	129000	115000	130000	130000	114000	-	-	120000	130000	140000	120000	120000	200	107000	121000
Magnesium	µg/L	1	NO	14400	15000	14600	15800	13500	16000	14800	15600	15600	15100	-	-	15000	17000	16000	17000	16000	19	13600	15800
Sodium	µg/L	10	NO	173000	288000	170000	318000	414000	208000	191000	210000	213000	193000	-	-	250000	260000	390000	270000	270000	1040	214000	233000
Potassium	µg/L	9	NO	2960	3000	2600	2730	3010	2830	3060	2760	2800.00	2810	-	-	2700	3100	3700	4500	4400	54	3180	2820

Notes:
1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Monitoring Well Location				SWB2																	
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO								Field Duplicate of SWB2										
Dissolved Metals																					
Aluminum-dissolved	µg/L	1	75	<4	60	40	4	3	<1	<1	5	2	<1	<5	6	11	<5	10	8	5	4
Aluminum (total)	µg/L	1	NO	-	-	110	-	-	372	-	-	-	-	39	61	750	600	60	26	173	21
Antimony	µg/L	0.9	20	<3	<0.5	<0.1	<0.5	<0.0025	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	
Arsenic	µg/L	0.2	100	<3	<1	0.3	<1	<5	<1	2	4	<1	<1	<1.0	<1	<1.0	<1.0	<1.0	< 0.2	0.5	0.2
Barium	µg/L	0.08	NO	122	140	173	139	143	174	170.000	187	161	139	160.000	160.000	160.000	180	150	158	150	176
Beryllium	µg/L	0.007	11	<1	<0.5	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.40	<0.40	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	µg/L	0.001	NO	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	-	-	< 0.01
Boron	µg/L	2	200	16	10	18	18	<50	81	37	23	21	13	24	17	22	19	18	22	18	20
Cadmium	µg/L	0.003	0.2	<0.1	<0.1	0.08	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	0.006	0.021	0.006
Chromium	µg/L	0.08	NO	12	3	2.1	8	<5	<1	3	1	<1	<1	<5.0	<5	<5.0	<5.0	<5.0	0.83	1.69	0.60
Cobalt	µg/L	0.004	0.9	<0.5	0.4	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	0.58	0.55	<0.50	0.183	0.209	0.120
Copper	µg/L	1	5	<2	2	5.3	2.8	<2.5	<0.5	1.2	1.3	<0.5	3.1	1.1	3.2	3.1	6.0	1.9	2.4	4.2	< 1
Iron	µg/L	7	300	831	1010	731	1030	933	745	553	606	712	613	820	900	1900	2200	820	1020	1280	708
Lead	µg/L	0.09	5	1	<1	0.83	0.8	0.7	0.7	10.3	<0.1	0.3	0.2	<0.50	<0.50	2.8	3.4	<0.50	0.10	1.19	0.11
Total Lithium (Li)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<5	<5.0	<5.0	<5.0	2.9	2.5	3.0
Manganese	µg/L	0.0	NO	70	100	30.000	80.000	102	52	34	38	47	45	53	59	130	110	67	72.3	80.3	39.0
Molybdenum	µg/L	0.40	40	<2	<5	0.7	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	0.55	0.64	0.53	0.60	0.33	0.60	< 0.4
Nickel	µg/L	0.10	25	<3	<5	<10	4	<5	<1	<1	<1	<1	<1	<1.0	<1.0	1.5	1.8	<1.0	0.9	1.1	0.50
Selenium	µg/L	0.04	100	<4	<1	<1	<1	<5	<1	2	9	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	0.28	0.27	0.262
Total Silicon (Si)	µg/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	5000.0	6300	5600	5000	4960	5680	5720
Silver	µg/L	0.05	0.1	<0.1	<0.1	<0.02	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05
Strontium	µg/L	0.08	NO	471	615	519	431	545	539	475	533	516	399	480.000	490.000	580.000	670	590	740	498	546
Total Tellurium (Te)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	-	< 0.005	< 0.005
Total Tin (Sn)	µg/L	0.06	NO	-	-	-	-	-	<5	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	< 0.06
Titanium	µg/L	0.10	NO	3	<10	<5	<5	<25	<5	<5	<5	<5	<5	5.2	5.6	38	40	7.1	1.17	9.82	1.10
Tungsten	µg/L	0.02	30	<10	<5	20	<0.01	<50	<10	<10	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	0.14	0.15	0.043
Uranium	µg/L	0.00	5	<2	1	1.34	0.9	1.3	1.1	1.0000	1.1	1.1	0.8	1	1.1	1.4	1.1	0.96	0.969	0.708	0.90
Vanadium	µg/L	0.01	6	6	2	0.5	2.3	<2.5	0.8	0.7	0.8	0.7	0.7	0.87	1.1	3	2.6	0.97	0.81	1.5	0.70
Zinc	µg/L	2	30	7	<10	14	11	<25	8	6	6	<5	6	5.9	9.2	8	31	<5.0	4	14	2.0
Zirconium	µg/L	2	4	<4	<2	<3	<1	<5	<1	<1	2	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	-	< 2
Dissolved Mercury	µg/L	0.01	0.2	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01
Inorganics																					
Electrical Conductivity	uS/cm	2	NO	1430	2180	1380	2130	2980	1790	1780	1790	1790	1860	1900	1900	1900	2300	1900	2200	1510	1800
pH	No unit	0.05	6.5-8.5	8.35	7.99	7.72	7.70	7.56	7.99	7.96	8.00	7.66	7.86	8.17	8.18	8.21	8.23	7.99	8.22	7.95	8.05
Total Hardness (as CaCO3)	mg/L	0.05	NO	348	389	335	384	334	389	383	422	419	352	440	350	360	390	350	-	323	372
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	258	264	269	302	279	273	258	257	274	275	270	270	250	280	230	265	229	259
Chloride	mg/L	0.04	NO	340	526	370	478	623	398	401	382	345	370	420	390	440	600	450	570	390	590
Sulphate	mg/L	0.04	NO	29.4	32	30	40	40	30	34.3	35.1	31.7	30.6	29	28	27	38	27	43	23	27
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053	0.022
Ammonia as N	as N mg/L	0.10	NO	-	0.54	0.11	0.66	0.53	0.34	0.23	0.22	0.29	0.23	0.34	0.29	0.37	0.31	0.25	0.30	0.20	0.20
Unionized Ammonia (calculated)	mg/L as N		0.02	-	0.002	<0.001	0.001	0.016	0.013	0.010	0.010	0.004	0.004	0.011	0.012	0.017	0.007	0.007	0.003	0.005	0.005
Calcium	µg/L	10	NO	116000	131000	132000	127000	113000	128000	129000	142000	141000	115000	-	120000	130000	160000	120000	136000	105000	123000
Magnesium	µg/L	1	NO	14200	15000	15700	16100	12400	17000	14800	16500	16400	15700	-	15000	16000	18000	16000	16000	14600	16000
Sodium	µg/L	10	NO	166000	315000	179000	301000	346000	224000	203000	225000	224000	187000	-	250000	250000	360000	270000	346000	184000	234000
Potassium	µg/L	9	NO	2970	3000	2700	2670	2670	2970	3360	3760	2800.00	2690.00	-	2600.00	2900.00	3800	4500	3870	2900	2790

- Notes:
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 5. Bold type and shaded indicates an exceedance of the PWQO

Monitoring Well Location				SWB3																					
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	11-Sep-20	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	30-Aug-23	13-Sep-24	13-Sep-24
Parameter	Units	RDL	PWQO						Field Duplicate of SWB3							Field Duplicate of SWB3			Field Duplicate of SWB3				Field Duplicate of SWB3		Field Duplicate of SWB3
Dissolved Metals																									
Aluminum-dissolved	µg/L	1	75	<4	50	40	4	4	<1	<1	3	2	<1	<5	6	6	9	<5	<5	8	17	5	5	4	3
Aluminum (total)	µg/L	1	NO	-	-	200	-	-	35	515	-	-	-	21	41	46	330	41	41	86	54	161	173	19	19
Antimony	µg/L	0.9	20	<3	<0.5	0.1	<0.5	<0.0025	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Arsenic	µg/L	0.2	100	<3	<1	0.4	<1	<5	<1	<1	2	<1	<1	<1.0	<1	<1	<1.0	<1.0	<1.0	0.2	0.4	0.3	< 0.2	< 0.2	
Barium	µg/L	0.08	NO	116	150	181	156	158	163	167	199	156	157	140.000	150.000	150.000	150.000	160	160	150	157	152	157	167	169
Beryllium	µg/L	0.007	11	<1	<0.5	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	< 0.007	0.007	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	µg/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.01	< 0.01
Boron	µg/L	2	200	17	10	19	18	<50	32	79	26	20.000	18.000	29.000	16.000	16.000	23.000	19	18	19	19	17	18	19	19
Cadmium	µg/L	0.003	0.2	<0.1	<0.1	0.08	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.09	<0.090	<0.090	<0.090	<0.090	0.009	0.019	0.020	0.004	0.005
Chromium	µg/L	0.08	NO	14	3	2.5	9	<5	<1	1	1	<1	<1	<5.0	<5	<5	<5.0	<5.0	<5.0	0.95	1.52	1.63	0.60	0.50	
Cobalt	µg/L	0.004	0.9	<0.5	0.4	0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	0.177	0.198	0.208	0.100	0.110
Copper	µg/L	1	5	2	2	6.9	3.2	<2.5	<0.5	<0.5	2.2	<0.5	1.7	1.0000	1.4	1.3	2.3	1.3	1.4	2.2	1.9	3.4	3.2	< 1	< 1
Iron	µg/L	7	300	1270	1200	1200	1420	1100	391	1390	1100	742	995	1100	800	800	1300	960	950	870	979	1230	1300	697	708
Lead	µg/L	0.09	5	1	<1	1.62	1.3	0.9	0.6	4.1	0.4	0.3	0.9	<0.50	<0.50	<0.50	1.4	<0.50	<0.50	<0.50	0.21	1.19	1.26	0.12	0.10
Total Lithium (Li)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<5	<5	<5.0	<5.0	<5.0	<5.0	2.7	3.0	2.7	3.0	3.0
Manganese	µg/L	0.0	NO	95	130	98	106	125	61	75	54	49	63	70	58	59	110	87	88	66	65.8	72.7	73.7	39.0	40.0
Molybdenum	µg/L	0.40	40	<2	<5	0.7	<0.5	<2.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	0.55	0.68	0.52	<0.50	0.56	0.28	0.55	0.51	< 0.4	< 0.4
Nickel	µg/L	0.10	25	<3	<5	<10	4	<5	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	1.1	<1.0	<1.0	1.1	0.8	1.0	1.0	0.50	0.50
Selenium	µg/L	0.04	100	<4	<1	<1	<1	<5	<1	<1	4	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	0.29	0.25	0.29	0.255	0.263	
Total Silicon (Si)	µg/L	20	NO	-	-	-	-	-	-	-	-	-	-	-	4800	4800	5600	4900	4800	5300	5250	6260	6220	5110	5200
Silver	µg/L	0.05	0.1	<0.1	<0.1	<0.02	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.09	<0.090	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	µg/L	0.08	NO	530	715	530.000	559	653	502	505	584	493	536	580	480	480	570	640	620	580	741	483	485	512	520
Total Tellurium (Te)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.05	<0.050	<0.050	<0.050	-	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Total Tin (Sn)	µg/L	0.06	NO	-	-	-	-	-	<5	<5	-	-	-	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	< 0.06	< 0.06
Titanium	µg/L	0.10	NO	5	<10	10.000	6	<25	<5	10.000	<5	<5	<5	<5.0	<5.0	<5.0	19	5.4	5.1	7.1	2.55	9.28	9.12	0.80	0.90
Tungsten	µg/L	0.02	30	<10	<5	10	<0.01	<50	<10	<10	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	0.09	0.13	0.13	0.042	0.045	
Uranium	µg/L	0.00	5	<2	1	1.46	1.1	1.3	0.3	1.1	1.1	1.1	1.1	1.2	0.98	0.99	1.5	0.99	0.96	0.92	0.914	0.671	0.691	0.90	0.90
Vanadium	µg/L	0.01	6	7	1	0.8	3.4	<2.5	<0.5	1.7	1.0	0.70	0.90	0.90	1.2	1.0	2.0	0.90	0.85	1.2	0.91	1.49	1.49	0.60	0.70
Zinc	µg/L	2	30	19	<10	29	18	<25	14	30	10	<5	9	<5.0	5.3	<5.0	<5.0	5.3	6.4	8.8	4	13	13	2.0	3.0
Zirconium	µg/L	2	4	<4	<2	<3	<1	<5	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	-	-	< 2	< 2	
Dissolved Mercury	µg/L	0.01	0.2	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	-	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																									
Electrical Conductivity	uS/cm	2	NO	1560	2400	1390	2300	3140	1800	1800	1980	1830	1980	2100	1900	2000	1900	2400	2400	1900	2180	1410	1450	1820	1860
pH	No unit	0.05	6.5-8.5	8.32	7.95	7.76	7.66	7.51	7.91	7.95	8.01	7.70	7.56	8.14	8.17	8.22	8.19	8.17	8.10	8.07	8.19	7.99	8.33	8.17	8.10
Total Hardness (as CaCO3)	mg/L	0.05	NO	374	380	347	461	332	392	400	417	392	388	430	350	350	350	410	400	350	-	331	341	357	358
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	259	264	259	292	279	273	267	269	271	262	260	270	260	240	280	270	240	255	230	224	241	294
Chloride	mg/L	0.04	NO	426	589	394	522	788	399	361	466	365	390	480	420	410	440	610	620	440	620	360	510	530	
Sulphate	mg/L	0.04	NO	32.7	35	30	40	40	30	30	36.9	31.4	32.7	30	28	28	28	38	38	29	42	25	24	26	27
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.053	0.055	0.021	0.022
Ammonia as N	as N mg/L	0.10	NO	-	0.54	0.11	0.56	0.53	0.27	0.28	0.22	0.26	0.40	0.34	0.31	0.30	0.35	0.69	0.72	0.19	0.40	0.20	0.20	0.20	0.20
Unionized Ammonia (calculated)	mg/L as N		0.02	-	0.002	<0.001	0.001	0.011	0.012	0.012	0.011	0.005	0.004	0.011	0.012	0.013	0.016	0.014	0.012	0.005	0.004	0.005	0.004	0.003	0.003
Calcium	µg/L	10	NO	127000	129000	136000	156000	113000	131000	133000	141000	131000	127000	-	120000	120000	120000	140000	140000	130000	136000	107000	111000	118000	118000
Magnesium	µg/L	1	NO	13900	14000	16000.0	17000.0	12200	15500	16500	15600	15600	17000	-	15000	15000	15000	16000	16000	17000	15900	15400	15600	15500	15500
Sodium	µg/L	10	NO	227000	382000	180000	414000	465000	209000	208000	243000	214000	232000	-	240000	240000	280000	360000	350000	260000	332000	171000	172000	223000	226000
Potassium	µg/L	9	NO	3460	3000	2800	3040	2840	2760	2780	3940	2710	3270	-	2500.00	2500.00	2700.00	3500	3300	4400	3680	2920	2960	2660	2740

Notes:

1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Table 4
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Bunker's Creek Historical Waste Sites

Monitoring Well Location				SWB4																
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO																	
Dissolved Metals																				
Aluminum-dissolved	µg/L	1	75	<4	30	40	6	8	<1	<1	2	<1	<5	6	10	<5	5	7	4	13
Aluminum (total)	µg/L	1	NO	-	-	70	-	-	347	-	-	-	88	25	820	37	28	23	74	10
Antimony	µg/L	0.9	20	<3	<0.5	0.2	<0.5	<0.0025	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9
Arsenic	µg/L	0.2	100	<3	<1	0.6	<1	<5	<1	2	<1	<1	<1.0	<1	<1.0	<1.0	<1.0	< 0.2	0.5	< 0.2
Barium	µg/L	0.08	NO	121	140	163	137	161	156	145	147	144	150	130	140	160	170	156	168	167
Beryllium	µg/L	0.007	11	<1	<0.5	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.40	<0.40	< 0.007	< 0.007	< 0.007
Total Bismuth (Bi)	µg/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	-	-	< 0.01
Boron	µg/L	2	200	17	10	22	18	<50	85	39	14	18	29	17	28	20	20	19	19	23
Cadmium	µg/L	0.003	0.2	<0.1	<0.1	0.10000	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	< 0.003	0.008	0.007
Chromium	µg/L	0.08	NO	12	3	2.6	9	<5	<1	1	<1	<1	<5.0	<5	<5.0	<5.0	5.2	0.91	3.78	0.50
Cobalt	µg/L	0.004	0.9	<0.5	0.4	0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	0.6	<0.50	<0.50	0.165	0.158	0.110
Copper	µg/L	1	5	2.0	2.0	8.9	1.8	<2.5	<0.5	1.0	<0.5	1.4	2.3	1.3	3.8	1.8	5.3	1.8	2.3	< 1
Iron	µg/L	7	300	1260	1190	1010	1330	1180	927	760	<100	1060	1300	960	1900	1100	790	895	1450	784
Lead	µg/L	0.09	5	<1	<1	5.41	0.3	1.3	0.3	<0.1	<0.1	0.2	0.69	<0.50	4.7	<0.50	<0.50	0.09	0.50	< 0.09
Total Lithium (Li)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	<5	<5.0	<5.0	<5.0	2.7	2.5	3.0
Manganese	µg/L	0.0	NO	101	120	79	118	136	64	39	7	68	79	62	120	100	53	62	97.4	42.0
Molybdenum	µg/L	0.40	40	<2	<5	0.8	<0.5	<2.5	0.7	<0.5	<0.5	<0.5	<0.50	<0.5	1.6	0.59	0.63	0.28	0.51	0.40
Nickel	µg/L	0.10	25	<3	<5	<10	4	<5	<1	<1	<1	<1	<1.0	<1.0	1.5	1.1	1.1	0.7	0.9	0.50
Selenium	µg/L	0.04	100	<4	<1	<1	<1	<5	<1	3	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	0.27	0.35	0.311
Total Silicon (Si)	µg/L	20	NO	-	-	-	-	-	-	-	-	-	-	4300	6200	4600	6800	5320	5890	5400
Silver	µg/L	0.05	0.1	<0.1	<0.1	0.02	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05
Strontium	µg/L	0.08	NO	573	763	690.000	614	841	695	582	348	562	600	540	560	780	520	699	638	587
Total Tellurium (Te)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	-	< 0.005	< 0.005
Total Tin (Sn)	µg/L	0.06	NO	-	-	-	-	-	<5	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	< 0.06
Titanium	µg/L	0.10	NO	2	<10	<5	<5	<25	<5	<5	<5	<5	7.8	<5.0	43	5.5	<5.0	0.94	4.53	0.40
Tungsten	µg/L	0.02	30	<10	<5	20	<10	<50	<10	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	0.08	0.07	0.042
Uranium	µg/L	0.00	5	<2	1	1.44	1.3	1.6	1.4	1.3	0.8	1.1	1.3	1.1	4.2	1.2	0.65	0.905	1.03	1.10
Vanadium	µg/L	0.01	6	7	1	0.6	4.4	<2.5	0.7	0.6	0.6	0.8	1.2	1	3.5	0.90	0.86	0.85	1.4	0.80
Zinc	µg/L	2	30	8	20	13	6	<25	7	<5	<5	14	14	<5.0	10	5.9	5.9	4.0	9.0	2.0
Zirconium	µg/L	2	4	<4	<2	<3	<1	<5	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	-	< 2
Dissolved Mercury	µg/L	0.01	0.2	<0.1	<0.1	<0.02	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01
Inorganics																				
Electrical Conductivity	uS/cm	2	NO	1600	2580	1450	2310	4410	2010	1870	1590	1960	2100	1900	2400	2900	1600	2540	1640	1640
pH	No unit	0.05	6.5:8.5	8.35	7.95	7.72	7.73	7.49	7.81	7.94	7.87	7.60	8.15	8.15	8.20	8.15	8.13	8.19	8.10	8.21
Total Hardness (as CaCO3)	mg/L	0.05	NO	332	377	335	459	358	374	376	388	388	430	330	350	390	310	-	349	374
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	257	262	268	295	267	278	288	276	249	270	250	240	270	200	244	240	271
Chloride	mg/L	0.04	NO	404	649	414	505	1130	442	434	324	365	470	430	600	780	340	700	440	540
Sulphate	mg/L	0.04	NO	32.6	37	30	40	40	30	35.7	30.0	34.9	29	28	32	38	28	46	28	28
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.035	0.013
Ammonia as N	as N mg/L	0.10	NO	-	0.40	0.15	0.51	0.44	0.38	0.24	<0.03	0.34	0.26	0.26	0.30	0.31	0.21	0.2	0.20	0.20
Unionized Ammonia (calculated)	mg/L as N		0.02	-	-	0.002	0.001	0.011	0.016	0.009	<0.001	0.004	0.009	0.010	0.015	0.006	0.006	0.002	0.004	0.004
Calcium	µg/L	10	NO	113000	128000	130000	156000	123000	125000	127000	129000	126000	-	110000	120000	140000	96000	132000	114000	123000
Magnesium	µg/L	1	NO	12200	14000	15100	16900	12500	14700	14000.0	15800.0	17500.0	-	14000.0	14000.0	16000	16000	15800	15700	16200
Sodium	µg/L	10	NO	216000	428000	221000	369000	696000	258000	216000	169000	239000	-	260000	370000	480000	190000	315000	264000	249000
Potassium	µg/L	9	NO	3110	3000	2800	3190	3210	2990	3390	2260	3260	-	2600.00	3000.00	3900	4000	3560	2980	2900

- Notes:
1. NO = No objective
 2. mg/L = Milligrams per Litre
 3. RDL = Laboratory Reportable Detection Limit
 4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
 5. Bold type and shaded indicates an exceedance of the PWQO

Table 4
Surface Water Analytical Results
Metals and Inorganics
City of Barrie Bunker's Creek Historical Waste Sites

Monitoring Well Location				SWB5																		Field Blank
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	26-Apr-23	30-Aug-23	13-Sep-24	13-Sep-24
Parameter	Units	RDL	PWQO															Field Duplicate of SWB5				
Dissolved Metals																						
Aluminum-dissolved	µg/L	1	75	<4	50	40	4	6	<1	<1	<1	<1	<5	6	11	6	12	9	10	4	3	14
Aluminum (total)	µg/L	1	NO	-	-	70	-	-	347	-	-	-	24	33	290	75	29	99	32	158	11	< 1
Antimony	µg/L	0.9	20	<3	<0.5	<0.1	<0.5	<0.0025	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Arsenic	µg/L	0.2	100	<3	<1	0.4	<1	<5	<1	1	<1	<1	<1.0	<1	<1.0	<1.0	<1.0	0.2	< 0.2	0.8	< 0.2	< 0.2
Barium	µg/L	0.08	NO	102	120	154	127	153	148	140	139	133	140	120	120	150	120	147	139	217	149	< 0.08
Beryllium	µg/L	0.007	11	<1	<0.5	<0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.40	<0.40	<0.40	<0.40	< 0.007	< 0.007	0.009	< 0.007	< 0.007
Total Bismuth (Bi)	µg/L	0.01	NO	-	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	-	-	-	< 0.01	-
Boron	µg/L	2	200	11	<10	16	15	<50	82	30	19	13	24	14	17	17	16	21	15	15	18	< 2
Cadmium	µg/L	0.003	0.2	<0.1	<0.1	0.12	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	0.004	0.006	0.024	0.003	< 0.003
Chromium	µg/L	0.08	NO	12	3	4.9	8	<5	<1	1	<1	<1	<5.0	<5	<5.0	<5.0	<5.0	1.74	0.91	1.03	0.70	< 0.08
Cobalt	µg/L	0.004	0.9	<0.5	0.4	0.1	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<5.0	<0.5	<0.50	<0.50	<0.50	0.164	0.140	0.131	0.081	< 0.004
Copper	µg/L	1	5	<2	2	10.0	1.1	<2.5	<0.5	0.8	<0.5	1.1	<1.0	<0.90	1.8	1.6	3.0	1.5	1.8	2.5	< 1	< 1
Iron	µg/L	7	300	604	540	605	511	1040	586	431	564	521	470	630	950	730	440	1120	407	1650	279	< 7
Lead	µg/L	0.09	5	1	<1	1.42	0.1	1.2	0.2	<0.1	<0.1	0.1	<0.50	<0.50	1.4	<0.50	<0.50	0.15	< 0.09	0.78	< 0.09	< 0.09
Total Lithium (Li)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	<5	<5.0	<5.0	<5.0	2.7	2.6	3.0	2.0	< 0.1
Manganese	µg/L	0.0	NO	81	100	64	95	168	61	42	58	60	53	58	93	84	54	71.3	49.1	97.7	29.0	< 0.01
Molybdenum	µg/L	0.40	40	<2	<5	1.5	<0.5	<2.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.5	1.4	0.61	0.69	0.36	0.40	0.49	0.40	< 0.4
Nickel	µg/L	0.10	25	<3	<5	<10	4	<5	<1	<1	<1	1.0	<1.0	<1.0	1.0	1.1	<1.0	0.8	0.8	0.6	0.50	< 0.1
Selenium	µg/L	0.04	100	<4	<1	<1	<1	<5	<1	2	<1	<1	<2.0	<2.0	<2.0	<2.0	<2.0	0.28	0.38	0.20	0.296	< 0.04
Total Silicon (Si)	µg/L	20	NO	-	-	-	-	-	-	-	-	-	-	4200	5100	4500	4200	4820	4780	9140	5230	< 20
Silver	µg/L	0.05	0.1	<0.1	<0.1	0.02	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.10	<0.09	<0.090	<0.090	<0.090	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Strontium	µg/L	0.08	NO	521	684	636	0.568	1010	628	562	600	521	570	500	530	790	640	829	805	409	526	< 0.08
Total Tellurium (Te)	µg/L	0.1	NO	-	-	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<1.0	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.005	0.3	<0.3	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.050	<0.05	<0.050	<0.050	<0.050	-	-	0.005	< 0.005	< 0.005
Total Tin (Sn)	µg/L	0.06	NO	-	-	-	-	-	<5	-	-	-	-	<1.0	<1.0	<1.0	<1.0	-	-	-	0.3	< 0.06
Titanium	µg/L	0.10	NO	4	<10	<5	<5	<25	<5	<5	<5	<5	<5.0	<5.0	18	6.0	<5.0	1.88	1.36	9.19	0.60	< 0.1
Tungsten	µg/L	0.02	30	<10	<5	20	<10	<50	<10	<10	<10	<10	<1.0	<1.0	<1.0	<1.0	<1.0	0.10	0.14	0.06	0.034	< 0.2
Uranium	µg/L	0.00	5	<2	1	1.72	1.4	1.3	1.5	1.4	1.5	1.3	1.3	1.2	2.9	1.4	1.0	1.066	1.181	0.631	1.20	< 0.002
Vanadium	µg/L	0.01	6	8	1	0.8	4.2	<2.5	0.9	0.9	0.9	1.0	1.1	1.1	2.3	1.4	1.3	0.97	1.09	1.1	0.80	< 0.01
Zinc	µg/L	2	30	16	<10	13	<5	34	<5	<5	<5	15	<5.0	<5.0	<5.0	5.9	<5.0	4	3	9	< 2	< 2
Zirconium	µg/L	2	4	<4	<2	<3	<1	<5	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	-	< 2	< 2
Dissolved Mercury	µg/L	0.01	0.2	<0.1	<0.1	<0.02	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.10	<0.10	-	<0.10	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Inorganics																						
Electrical Conductivity	uS/cm	2	NO	1520	2560	1410	2260	5360	1910	1800	1900	1890	2000	1900	2100	2900	2000	2490	2510	1060	1750	4
pH	No unit	0.05	6.5-8.5	8.38	8	7.80	7.78	7.42	7.91	7.93	7.83	7.80	8.20	8.28	8.37	8.18	8.17	8.21	8.23	8.37	8.23	6.79
Total Hardness (as CaCO3)	mg/L	0.05	NO	327	366	359	449	337	372	386	390	371	430	320	320	380	320	-	-	298	338	< 0.050
Alkalinity (as CaCO3)	mg/L as CaCO3	2	NO	252	254	259	298	271	268	258	265	245	260	240	220	260	210	233	236	221	220	3
Chloride	mg/L	0.04	NO	389	642	358	469	1260	410	421	417	389	440	430	510	770	470	660	670	260	600	< 0.2
Sulphate	mg/L	0.04	NO	33.5	38	40	40	50	30	38.1	35.9	33.6	31	28	30	40	28	48	50	26	29	< 0.2
Phosphorus (total)	mg/L	0.003	0.030*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.042	0.010	< 0.003
Ammonia as N	as N mg/L	0.10	NO	-	0.14	<0.03	0.25	0.28	0.12	0.06	0.11	0.080	0.080	0.14	0.13	0.11	0.13	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Unionized Ammonia (calculated)	mg/L as N		0.02	-	0.001	<0.001	0.001	0.006	0.005	0.003	0.002	0.001	0.003	0.007	0.009	0.002	0.005	< 0.001	< 0.001	0.002	< 0.002	< 0.001
Calcium	µg/L	10	NO	110000	125000	133000	151000	116000	124000	130000	131000	122000	-	110000	110000	140000	110000	127000	127000	90200	110000	< 10
Magnesium	µg/L	1	NO	12600	13000	15600	17200	11100	14700	14700	15300	15900	-	13000	13000	16000	15000	15100	15000	17700	15300	1
Sodium	µg/L	10	NO	192000	416000	212000	355000	801000	233000	215000	240000	221000	-	240000	320000	470000	280000	395000	397000	99200	223000	< 10
Potassium	µg/L	9	NO	2690	3000	2700	3100	3050	2730	3350	2800	2860	-	2400	2600	4100	4900	3540	3570	2390	2690	< 9

Notes:
1. NO = No objective
2. mg/L = Milligrams per Litre
3. RDL = Laboratory Reportable Detection Limit
4. PWQO = Provincial Water Quality Objectives, July, 1994 (* = interim guideline only)
5. Bold type and shaded indicates an exceedance of the PWQO

Surface Water Location				SWB1																			
Sampling Date				08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	15-Sep-17 Field Duplicate of SWB1	07-Sep-18	05-Sep-19	05-Sep-19 Field Duplicate of SWB1	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	30-Sep-22 Field Duplicate of SWB1	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO																				
VOC																							
Acetone	µg/L	30	NO	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 30	< 30	< 30
Benzene	µg/L	0.5	100	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.17	<0.17	<0.17	<0.17	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	200	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	0.9	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	NO	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Chloroethane	µg/L	1	NO	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	-	<0.20	-	-	-	-	-
Chloroform	µg/L	0.5	NO	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Chloromethane	µg/L	0.2	700	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	<0.20	-	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	40	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	NO	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	200	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	100	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	40	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	200	0.98	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	200	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	NO	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	5	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	NO	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1
Methylene Chloride	µg/L	0.5	100	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	NO	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	400	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	200	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2
Styrene	µg/L	0.5	4	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	50	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	3	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.50	-	-	-	-	-
Vinyl Chloride	µg/L	0.2	600	<0.17	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.28	0.29	<0.20	0.23	0.46	<0.20	<0.20	0.4	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	32	<0.20	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	40	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	NO	<0.20	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	NO	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	< 5
Petroleum Hydrocarbons																							
F1 (C6 to C10) minus BTEX	ug/L	25	NO	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	< 25	< 25	< 25
F2 (C10 to C16) minus Naphthalene	ug/L	100	NO	-	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	< 100	< 100	< 100
F3 (C16-C34)	ug/L	200	NO	<200	<400	<100	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	< 200	< 200	< 200
F4 (C34-C50)	ug/L	200	NO	<200	<400	<100	<100	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	<200	<200	< 200	< 200	< 200

Table 5
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location			SWB2																	
Sampling Date			08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL							Field Duplicate of SWB2											
VOC																				
Acetone	µg/L	30	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<10	<10	<10	<10	<10	< 30	< 30	< 30
Benzene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.17	<0.17	<0.17	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Chloroethane	µg/L	1	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	<0.20	-	-	-	-
Chloroform	µg/L	0.5	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Chloromethane	µg/L	0.2	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	<0.20	-	-	-	-
Dibromochloromethane	µg/L	0.5	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	-	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1
Methylene Chloride	µg/L	0.5	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	-	<5.0	<5.0	<10	<10	<10	<10	<10	< 20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2
Styrene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	<0.50	-	-	-	-
Vinyl Chloride	µg/L	0.2	<0.17	0.9	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	<0.20	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	<0.20	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	-	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	< 5
Petroleum Hydrocarbons																				
F1 (C6 to C10) minus BTEX	ug/L	25	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	< 25	< 25	< 25
F2 (C10 to C16) minus Naphthalene	ug/L	100	-	<100	<50	<100	<236	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	< 100	< 100	< 100
F3 (C16-C34)	ug/L	200	<200	<400	<100	<236	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200
F4 (C34-C50)	ug/L	200	<200	<400	<100	<236	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200

Surface Water Location			SWB3																								
Sampling Date			08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	11-Sep-20	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	30-Aug-23	30-Aug-23	13-Sep-24	13-Sep-24		
Parameter	Units	RDL							Field Duplicate of SWB3						Field Duplicate of SWB3			Field Duplicate of SWB3				Field Duplicate of SWB3	PHC Re-Analysis		Field Duplicate of SWB3		
VOC																											
Acetone	µg/L	30	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 30	< 30	< 30	-	< 30	< 30		
Benzene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.17	<0.17	<0.17	<0.17	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Bromodichloromethane	µg/L	0.5	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Bromoform	µg/L	0.5	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Bromomethane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Carbon Tetrachloride	µg/L	0.2	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2		
Chlorobenzene	µg/L	0.5	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Chloroethane	µg/L	1	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	-	<0.20	<0.20	<0.20	-	-	-	-	-	-		
Chloroform	µg/L	0.5	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Chloromethane	µg/L	0.2	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	-	<0.20	<0.20	<0.20	-	-	-	-	-	-		
Dibromochloromethane	µg/L	0.5	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,2-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,3-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,4-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Dichlorodifluoromethane	µg/L	2	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2	-	< 2	< 2		
1,1-Dichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,2 - Dichloroethane	µg/L	0.5	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,1 Dichloroethylene	µg/L	0.5	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
cis- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
trans- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,2-Dichloropropane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Ethylbenzene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Ethylene Dibromide	µg/L	0.2	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	-	< 0.2	< 0.2		
n-Hexane	µg/L	1	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1	-	< 1	< 1		
Methylene Chloride	µg/L	0.5	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Methyl Isobutyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20	-	< 20	< 20		
Methyl Ethyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	<10	<10	< 20	< 20	< 20	-	< 20	< 20		
Methyl tert-butyl ether	µg/L	2	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2	-	< 2	< 2		
Styrene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
1,1,2,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Tetrachloroethylene	µg/L	0.5	<0.20	0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	< 0.5		
Toluene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	-	< 0.5	<		

Surface Water Location			SWB4																
Sampling Date			08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL																	
VOC																			
Acetone	µg/L	30	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	< 30	< 30	< 30
Benzene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.17	<0.17	<0.17	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	0.74	< 0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Chloroethane	µg/L	1	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	<0.20	-	-	-	-
Chloroform	µg/L	0.5	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	1.2	< 0.5	< 0.5	< 0.5
Chloromethane	µg/L	0.2	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	<0.20	-	-	-	-
Dibromochloromethane	µg/L	0.5	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	0.58	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1
Methylene Chloride	µg/L	0.5	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	< 20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2
Styrene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
1,1,1,2,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,1,1,2-Trichloroethane	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<0.50	-	-	-	-
Vinyl Chloride	µg/L	0.2	<0.17	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	<0.20	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	<0.20	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	< 5
Petroleum Hydrocarbons																			
F1 (C6 to C10) minus BTEX	ug/L	25	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	< 25	< 25	< 25
F2 (C10 to C16) minus Naphthalene	ug/L	100	-	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	< 100	< 100	< 100
F3 (C16-C34)	ug/L	200	-	<200	<400	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200
F4 (C34-C50)	ug/L	200	-	<200	<400	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200

Surface Water Location			SWB5																	
Sampling Date			08-Nov-12	23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL																Field Duplicate of SWB5		
VOC																				
Acetone	µg/L	30	<1.0	<50	< 30	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	< 30	< 30	< 30	< 30
Benzene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.17	<0.17	<0.17	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	<0.20	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	1.7	< 0.5
Bromoform	µg/L	0.5	<0.10	<0.4	< 5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.0	<1.0	<1.0	<1.0	<1.0	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	<0.20	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	<0.10	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	µg/L	1	<0.20	<0.2	-	<1.0	<1.0	<1.0	<1.0	-	-	-	-	-	<0.20	-	-	-	-	-
Chloroform	µg/L	0.5	<0.20	<0.5	< 1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	4.2	< 0.5
Chloromethane	µg/L	0.2	<0.40	<0.2	-	<3.0	<3.0	<3.0	<3.0	-	-	-	-	-	<0.20	-	-	-	-	-
Dibromochloromethane	µg/L	0.5	<0.10	<0.3	< 2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	0.6	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	<0.10	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	<0.20	<0.5	< 2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 2	< 2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	<0.20	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	<0.30	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	<0.10	<0.2	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	<0.20	<5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	< 1	< 1	< 1	< 1
Methylene Chloride	µg/L	0.5	<0.30	<4.0	< 5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	<2.0	<2.0	<2.0	<2.0	< 0.5	< 0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	< 20	< 20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	<1.0	<10	< 20	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<10	<10	<10	<10	<10	< 20	< 20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	<0.20	<10	< 2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 2	< 2	< 2	< 2
Styrene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	<0.20	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	<0.30	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	<0.20	<0.4	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.50	<0.50	<0.50	<0.50	<0.50	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	<0.20	<0.3	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	-	<0.3	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	<0.50	-	-	-	-	-
Vinyl Chloride	µg/L	0.2	<0.17	<0.2	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.2	< 0.2	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	<0.20	<0.5	< 1.0	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	<0.10	<0.5	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	<0.20	<1.0	< 1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.20	<0.20	<0.20	<0.20	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	<0.40	<0.5	< 5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	< 5	< 5	< 5	< 5
Petroleum Hydrocarbons																				
F1 (C6 to C10) minus BTEX	ug/L	25	-	<100	<50	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	<25	< 25	< 25	< 25	< 25
F2 (C10 to C16) minus Naphthalene	ug/L	100	-	<100	<50	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	< 100	< 100	< 100	< 100
F3 (C16-C34)	ug/L	200	-	<200	<400	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200	< 200
F4 (C34-C50)	ug/L	200	-	<200	<400	<100	<100	<100	<100	<100	<100	<200	<200	<200	<200	<200	< 200	< 200	< 200	< 200

Table 5
Surface Water Analytical Results
VOC and Petroleum Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location			FIELD BLANK	Trip Blank
Sampling Date			13-Sep-24	13-Sep-24
Parameter	Units	RDL		
VOC				
Acetone	µg/L	30	< 30	< 30
Benzene	µg/L	0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	0.5	< 0.5	< 0.5
Bromoform	µg/L	0.5	< 0.5	< 0.5
Bromomethane	µg/L	0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	< 0.5	< 0.5
Chloroethane	µg/L	1	-	-
Chloroform	µg/L	0.5	< 0.5	< 0.5
Chloromethane	µg/L	0.2	-	-
Dibromochloromethane	µg/L	0.5	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2	< 2	< 2
1,1-Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,2 - Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,1 Dichloroethylene	µg/L	0.5	< 0.5	< 0.5
cis- 1,2-Dichloroethylene	µg/L	0.5	< 0.5	< 0.5
trans- 1,2-Dichloroethylene	µg/L	0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	< 0.5	< 0.5
1,3-Dichloropropene (Cis + Trans)	µg/L	0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5
Ethylene Dibromide	µg/L	0.2	< 0.2	< 0.2
n-Hexane	µg/L	1	< 1	< 1
Methylene Chloride	µg/L	0.5	< 0.5	< 0.5
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20
Methyl Ethyl Ketone	µg/L	20	< 20	< 20
Methyl tert-butyl ether	µg/L	2	< 2	< 2
Styrene	µg/L	0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5
1,3,5-Trimethylbenzene	µg/L	0.5	-	-
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2
m & p-Xylene	µg/L	0.5	< 0.5	< 0.5
o-Xylene	µg/L	0.5	< 0.5	< 0.5
Xylene Mixture (Total)	µg/L	0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	< 5	< 5
Petroleum Hydrocarbons				
F1 (C6 to C10) minus BTEX	ug/L	25	< 25	< 25
F2 (C10 to C16) minus Naphthalene	ug/L	100	< 100	---
F3 (C16-C34)	ug/L	200	< 200	---
F4 (C34-C50)	ug/L	200	< 200	---

Table 6
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location				SWB1																		
Sampling Date				23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	15-Sep-17	07-Sep-18	05-Sep-19	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO								Field Duplicate of SWB1			Field Duplicate of SWB1					Field Duplicate of SWB1			
PAH																						
Naphthalene	ug/L	0.010	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	0.050	<0.050	0.013	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5
Acenaphthylene	ug/L	0.010	NO	<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	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Acenaphthene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	0.015	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluorene	ug/L	0.010	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	0.011	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Phenanthrene	ug/L	0.010	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.030	0.016	<0.030	<0.030	<0.030	< 0.1	< 0.1	< 0.1
Anthracene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluoranthene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	0.012	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	0.011	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benz(a)anthracene	ug/L	0.010	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Chrysene	ug/L	0.010	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	ug/L	0.010	NO	<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	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	ug/L	0.010	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	ug/L	0.0090	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.010	NO	<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	<0.050	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Dibenz(a,h)anthracene	ug/L	0.010	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	ug/L	0.010	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.010	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	0.017	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	ug/L	0.010	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	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5

Notes:

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

Table 6
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location				SWB2																
Sampling Date				23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16		15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO							Field Duplicate of SWB2										
PAH																				
Naphthalene	ug/L	0.010	7	<0.1	< 0.05	<0.05	<0.05	0.64	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5
Acenaphthylene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Acenaphthene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluorene	ug/L	0.010	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Phenanthrene	ug/L	0.010	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	0.010	<0.030	<0.030	< 0.1	< 0.1	< 0.1
Anthracene	ug/L	0.010	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	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluoranthene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	0.011	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benz(a)anthracene	ug/L	0.010	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Chrysene	ug/L	0.010	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	ug/L	0.010	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	ug/L	0.010	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	ug/L	0.0090	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Dibenz(a,h)anthracene	ug/L	0.010	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	ug/L	0.010	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	0.08	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	0.66	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	0.96	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5

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

Table 6
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location				SWB3																			
Sampling Date				23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15		07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	30-Aug-23	13-Sep-24	13-Sep-24
Parameter	Units	RDL	PWQO						Field Duplicate of SWB3								Field Duplicate of SWB3				Field Duplicate of SWB3		Field Duplicate of SWB3
PAH																							
Naphthalene	ug/L	0.010	7	0.1	< 0.05	<0.05	<0.05	0.64	0.59	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	ug/L	0.010	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	ug/L	0.010	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	0.16	0.13	<0.05	<0.05	<0.05	<0.030	<0.030	0.011	<0.030	<0.030	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	0.02	0.02	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	ug/L	0.010	0.0008	<0.1	0.09	<0.01	<0.01	0.33	0.33	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.01	<0.01	0.27	0.28	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benz(a)anthracene	ug/L	0.010	0.0004	<0.1	< 0.05	<0.01	<0.01	0.10	0.09	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	ug/L	0.010	0.0001	<0.05	< 0.05	<0.05	<0.05	0.19	0.16	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	ug/L	0.010	NO	<0.05	< 0.05	<0.05	<0.05	0.24	0.25	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	ug/L	0.010	0.0002	<0.05	< 0.05	<0.05	<0.05	0.13	0.13	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	ug/L	0.0090	NO	<0.01	< 0.01	<0.01	<0.01	0.14	0.13	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	0.02	0.02	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	0.12	0.12	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenz(a,h)anthracene	ug/L	0.010	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	ug/L	0.010	0.00002	<0.1	< 0.05	<0.05	<0.05	0.14	0.14	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	0.09	0.09	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	0.72	0.74	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	0.97	0.95	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

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

Table 6
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location				SWB4																
Sampling Date				23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	30-Aug-23	13-Sep-24
Parameter	Units	RDL	PWQO											Field Duplicate of SWB3						
PAH																				
Naphthalene	ug/L	0.010	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5
Acenaphthylene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Acenaphthene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluorene	ug/L	0.010	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Phenanthrene	ug/L	0.010	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.030	0.016	<0.030	<0.030	< 0.1	< 0.1	< 0.1
Anthracene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Fluoranthene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	0.019	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	0.017	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benz(a)anthracene	ug/L	0.010	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Chrysene	ug/L	0.010	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	ug/L	0.010	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	ug/L	0.010	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	ug/L	0.0090	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Dibenz(a,h)anthracene	ug/L	0.010	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	ug/L	0.010	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5

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

Table 6
Surface Water Analytical Results
Polycyclic Aromatic Hydrocarbons
City of Barrie Bunker's Creek Historical Waste Sites

Surface Water Location				SWB5																	FIELD BLANK
Sampling Date				23-Apr-13	23-Aug-13	10-Dec-13	26-Nov-14	24-Sep-15	07-Sep-16	15-Sep-17	07-Sep-18	05-Sep-19	11-Sep-20	17-Sep-21	11-Apr-22	30-Sep-22	26-Apr-23	26-Apr-23	30-Aug-23	13-Sep-24	13-Sep-24
Parameter	Units	RDL	PWQO														Field Duplicate of SWB5				
PAH																					
Naphthalene	ug/L	0.010	7	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	ug/L	0.010	0.2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	ug/L	0.010	0.03	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.030	<0.030	<0.010	<0.030	<0.030	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	ug/L	0.010	0.0008	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benz(a)anthracene	ug/L	0.010	0.0004	<0.1	< 0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Chrysene	ug/L	0.010	0.0001	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(b)fluoranthene	ug/L	0.010	NO	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(k)fluoranthene	ug/L	0.010	0.0002	<0.05	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	ug/L	0.0090	NO	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.0090	<0.0090	<0.0090	<0.0090	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Indeno(1,2,3-cd)pyrene	ug/L	0.010	NO	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dibenz(a,h)anthracene	ug/L	0.010	0.002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	ug/L	0.010	0.00002	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Biphenyl	ug/L	0.05	0.2	-	-	<0.05	<0.05	<0.05	<0.05	-	-	-	-	-	-	-	-	-	-	-	-
1-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-methylnaphthalene	ug/L	0.010	2	<0.1	< 0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.050	<0.010	<0.050	<0.050	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

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

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B1	2.80	Site 1	28-Jun-12	0.0	5.6	13.7	80.4
GP-B1		Site 1	18-Oct-12	0.0	6.6	13.7	79.7
GP-B1	2.80	Site 1	03-Dec-12	0.0	7.8	11.9	80.3
GP-B1	2.80	Site 1	18-Dec-12	0.0	6.0	13.8	80.2
GP-B1	2.80	Site 1	04-Apr-13	0.0	5.3	13.1	81.6
GP-B1	2.80	Site 1	20-Jun-13	0.0	5.7	13.5	80.8
GP-B1	2.80	Site 1	22-Aug-13	0.0	6.0	15.4	78.6
GP-B1	2.80	Site 1	10-Oct-13	0.1	6.6	14.9	78.4
GP-B1	2.80	Site 1	12-Dec-13	0.0	3.3	20.5	76.0
GP-B1	2.80	Site 1	12-Feb-14	0.0	8.0	15.9	76.1
GP-B1	2.80	Site 1	27-Nov-14	0.0	8.0	15.9	76.1
GP-B2	2.80	Site 1	11-Mar-15	0.0	2.6	20.4	77.0
GP-B1	2.80	Site 1	18-Sep-15	0.0	8.1	14.6	77.3
GP-B1	2.70	Site 1	14-Mar-16	0.0	3.2	18.1	78.7
GP-B1	2.78	Site 1	28-Feb-17	0.0	4.2	16.2	79.6
GP-B1	2.80	Site 1	23-Feb-18	0.1	1.3	20.3	78.3
GP-B1	2.80	Site 1	01-Apr-19	0.0	0.7	19.7	79.6
GP-B1	2.80	Site 1	20-Aug-19	0.1	6.1	14.5	79.3
GP-B1	2.72	Site 1	13-Feb-20	0.0	0.0	20.6	79.4
GP-B1	2.80	Site 1	03-Feb-21	0.0	6.8	14.7	78.6
GP-B1	2.80	Site 1	24-Feb-22	0.0	5.3	16.8	77.9
GP-B1	2.80	Site 1	20-Mar-23	0.0	6.1	14.2	79.7
GP-B1	2.80	Site 1	22-Feb-24	0.0	0.1	20.5	79.4
GP-B1		Site 1	19-Sep-24	Destroyed in Fire			
GP-B2		Site 1	18-Oct-12	12.6	3.7	9.0	74.7
GP-B2		Site 1	24-Oct-12	15.4	4.0	6.7	74.0
GP-B2	1.77	Site 1	03-Dec-12	19.9	3.9	3.7	72.5
GP-B2	2.90	Site 1	18-Dec-12	21.5	4.2	1.6	72.6
GP-B2	2.90	Site 1	23-Apr-13	15.3	2.9	6.6	75.4
GP-B2		Site 1	20-Jun-13	Well Damaged- No Reading Taken			
GP-B2	2.90	Site 1	22-Aug-13	15.3	4.1	7.4	73.4
GP-B2	2.90	Site 1	10-Oct-13	21.4	5.4	3.0	70.1
GP-B2	2.90	Site 1	12-Dec-13	4.5	1.0	18.8	75.8
GP-B2		Site 1	12-Feb-14	Well Buried- No Reading Taken			
GP-B2		Site 1	25-Nov-14	Well Damaged- No Reading Taken			
GP-B2		Site 1	11-Mar-15	Well Damaged- No Reading Taken			
GP-B2		Site 1	18-Sep-15	Could not locate			
GP-B2		Site 1	14-Mar-16	Could not locate			
GP-B2		Site 1	06-Jul-16	Gas Probe Decommissioned			

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B3	2.10	Site 2	28-Jun-12	0.0	1.3	18.1	80.1
GP-B3		Site 2	18-Oct-12	0.0	1.7	18.7	79.6
GP-B3	2.10	Site 2	03-Dec-12	0.0	2.1	19.2	78.7
GP-B3	2.10	Site 2	18-Dec-12	0.0	2.2	19.0	78.8
GP-B3	2.10	Site 2	04-Apr-13	0.0	2.5	17.1	80.2
GP-B3	2.10	Site 2	20-Jun-13	0.0	2.8	18.2	79.0
GP-B3	2.10	Site 2	22-Aug-13	0.0	3.6	18.3	78.1
GP-B3	2.10	Site 2	10-Oct-13	0.0	0.5	21.4	78.1
GP-B3	2.10	Site 2	12-Dec-13	0.0	3.0	20.5	76.5
GP-B3	2.10	Site 2	12-Feb-14	0.0	3.0	20.2	76.8
GP-B3	2.10	Site 2	27-Nov-14	0.0	2.2	20.4	77.4
GP-B3	2.10	Site 2	12-Mar-15	0.0	0.9	22.1	77.0
GP-B3	2.10	Site 2	18-Sep-15	0.0	2.5	19.9	77.6
GP-B3	2.10	Site 2	14-Mar-16	0.0	2.0	19.5	78.5
GP-B3	2.10	Site 2	28-Feb-17	0.0	1.7	19.2	79.1
GP-B3	1.78	Site 2	28-Feb-18	0.1	0.4	19.2	80.3
GP-B3	2.03	Site 2	01-Apr-19	0.0	0.4	20.1	79.5
GP-B3	2.10	Site 2	20-Aug-19	0.1	4.1	16.1	79.7
GP-B3	1.99	Site 2	13-Feb-20	0.0	0.1	20.8	79.1
GP-B3	2.10	Site 2	03-Feb-21	0.0	1.5	20.5	78.0
GP-B3	2.10	Site 2	24-Feb-22	0.0	2.2	19.0	78.8
GP-B3	2.10	Site 2	20-Mar-23	0.0	0.4	20.8	78.8
GP-B3	2.10	Site 2	22-Feb-24	0.0	0.0	21.1	78.9
GP-B3	2.10	Site 2	19-Sep-24	0.0	1.6	19.9	78.5
GP-B7		Site 7	28-Jun-12	0.0	0.9	18.2	80.9
GP-B7		Site 7	18-Oct-12	0.0	1.9	19.2	78.9
GP-B7	1.10	Site 7	03-Dec-12	0.0	1.8	19.8	78.4
GP-B7	1.12	Site 7	18-Dec-12	0.0	1.2	20.1	78.7
GP-B7	1.11	Site 7	04-Apr-13	0.0	0.4	20.4	79.2
GP-B7	1.07	Site 7	20-Jun-13	0.0	2.3	17.9	79.8
GP-B7	0.85	Site 7	22-Aug-13	0.0	1.9	19.5	78.6
GP-B7	0.83	Site 7	10-Oct-13	0.0	0.2	21.7	78.1
GP-B7	1.01	Site 7	12-Dec-13	0.0	0.7	20.9	78.4
GP-B7	1.02	Site 7	12-Feb-14	0.0	0.7	20.7	78.6
GP-B7	1.09	Site 7	27-Nov-14	0.0	1.1	21.2	77.7
GP-B7	1.15	Site 7	11-Mar-15	0.0	0.6	21.7	77.7
GP-B7	1.19	Site 7	18-Sep-15	0.0	2.1	19.6	78.3
GP-B7	1.14	Site 7	28-Feb-17	0.0	0.6	20.7	78.7
GP-B7	0.97	Site 7	23-Feb-18	0.0	0.0	21.8	78.2
GP-B7	1.09	Site 7	01-Apr-19	0.1	0.2	20.7	79.0
GP-B7	1.15	Site 7	20-Aug-19	0.1	1.2	17.9	80.8
GP-B7	1.13	Site 7	13-Feb-20	0.0	0.0	19.7	80.3
GP-B7	1.12	Site 7	03-Feb-21	0.0	0.6	20.4	79.0
GP-B7	1.19	Site 7	25-Jan-22	0.0	0.8	21.1	78.1
GP-B7	1.06	Site 7	20-Mar-23	0.0	0.4	21.4	78.2
GP-B7	0.82	Site 7	22-Feb-24	0.0	0.4	21.9	78.2
GP-B7	1.14	Site 7	19-Sep-24	0.0	1.3	19.8	78.8

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B8	3.43	Site 1	03-Dec-12	0.0	12.6	0.5	86.9
GP-B8	3.40	Site 1	18-Dec-12	0.0	2.0	18.0	80.0
GP-B8	3.34	Site 1	04-Apr-13	0.0	10.2	1.2	88.6
GP-B8	3.34	Site 1	20-Jun-13	0.0	2.6	16.8	80.5
GP-B8		Site 1	22-Aug-13	Not Accessible- No Reading Taken			
GP-B8	3.45	Site 1	10-Oct-13	0.1	3.4	17.2	79.3
GP-B8	3.42	Site 1	12-Dec-13	0.1	11.8	8.2	80.0
GP-B8	3.53	Site 1	13-Feb-14	0.0	8.6	9.5	81.9
GP-B8		Site 1	25-Nov-14	Well Damaged- No Reading Taken			
GP-B8	3.65	Site 1	27-Nov-14	0.0	0.1	21.8	78.1
GP-B8	3.59	Site 1	12-Mar-15	0.0	0.1	21.1	78.8
GP-B8	3.53	Site 1	18-Sep-15	0.0	0.7	20.4	78.8
GP-B8		Site 1	14-Mar-16	0.0	2.5	18.8	78.7
GP-B8		Site 1	28-Feb-17	Frozen - No Reading Taken			
GP-B8	0.32	Site 1	20-Mar-17	0.0	0.1	21.3	78.6
GP-B8	3.44	Site 1	28-Feb-18	0.0	0.0	22.5	77.5
GP-B8	1.96	Site 1	01-Apr-19	0.0	0.0	20.9	79.1
GP-B8	3.56	Site 1	20-Aug-19	0.1	0.3	18.6	81.0
GP-B8	1.94	Site 1	13-Feb-20	0.0	0.0	20.7	79.3
GP-B8	3.51	Site 1	24-Feb-21	0.0	0.1	21.0	78.9
GP-B8	3.47	Site 1	17-Feb-22	0.0	12.5	2.5	85.0
GP-B8	3.39	Site 1	20-Mar-23	0.0	6.2	2.3	91.5
GP-B8	3.43	Site 1	22-Feb-24	0.0	5.3	11.2	83.5
GP-B8	3.48	Site 1	19-Sep-24	0.0	8.5	9.2	82.3
GP-B14	1.57	Site 3	03-Dec-12	0.0	0.4	20.5	79.1
GP-B14	1.56	Site 3	18-Dec-12	0.0	0.4	20.5	79.1
GP-B14	1.42	Site 3	04-Apr-13	0.0	0.5	20.3	79.2
GP-B14	1.54	Site 3	20-Jun-13	0.0	1.1	19.3	79.6
GP-B14	1.70	Site 3	22-Aug-13	0.0	0.7	20.5	78.8
GP-B14	1.59	Site 3	10-Oct-13	0.0	0.7	20.7	78.6
GP-B14	1.57	Site 3	12-Dec-13	0.0	0.5	20.9	78.6
GP-B14	1.72	Site 3	12-Feb-14	0.0	0.6	21.0	78.4
GP-B14	1.47	Site 3	27-Nov-14	0.0	0.6	21.7	77.7
GP-B14	1.89	Site 3	11-Mar-15	0.0	0.5	21.9	77.6
GP-B14	1.89	Site 3	18-Sep-15	0.0	1.0	20.2	78.8
GP-B14	1.49	Site 3	28-Feb-17	0.0	0.4	21.2	78.4
GP-B14	1.76	Site 3	28-Feb-18	0.1	0.4	19.2	80.3
GP-B14	1.72	Site 3	01-Apr-19	0.0	0.0	20.4	79.6
GP-B14	1.99	Site 3	20-Aug-19	0.0	0.4	18.9	80.7
GP-B14	1.69	Site 3	13-Feb-20	0.0	0.0	20.4	79.6
GP-B14	1.86	Site 3	03-Feb-21	0.0	0.2	21.8	78.0
GP-B14	1.89	Site 3	25-Jan-22	0.0	0.4	21.5	78.1
GP-B14	1.68	Site 3	20-Mar-23	0.0	0.5	20.2	79.3
GP-B14	1.75	Site 3	22-Feb-24	0.0	0.0	20.5	79.5
GP-B14	2.03	Site 3	19-Sep-24	0.0	0.4	20.7	78.8

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B17	2.59	Site 3	03-Dec-12	0.0	1.0	20.5	78.5
GP-B17	2.57	Site 3	18-Dec-12	0.0	0.9	20.8	78.3
GP-B17	2.39	Site 3	04-Apr-13	0.0	1.0	18.1	80.9
GP-B17	2.48	Site 3	20-Jun-13	0.0	1.5	19.1	79.4
GP-B17	2.70	Site 3	22-Aug-13	0.0	1.1	20.3	78.6
GP-B17	2.61	Site 3	10-Oct-13	0.0	1.4	20.5	78.1
GP-B17	2.53	Site 3	12-Dec-13	0.0	0.9	20.8	78.3
GP-B17	2.74	Site 3	12-Feb-14	0.0	1.1	22.8	76.1
GP-B17	2.51	Site 3	27-Nov-14	0.0	1.1	21.4	77.5
GP-B17	2.63	Site 3	11-Mar-15	0.0	1.0	21.8	77.2
GP-B17	2.68	Site 3	18-Sep-15	0.0	1.5	20.0	78.5
GP-B17	2.22	Site 3	28-Feb-17	0.0	0.5	21.1	78.4
GP-B17	2.50	Site 3	28-Feb-18	0.1	0.8	18.3	80.8
GP-B17	2.43	Site 3	01-Apr-19	0.0	0.2	20.6	79.2
GP-B17	2.75	Site 3	20-Aug-19	0.1	0.8	18.8	80.3
GP-B17	2.40	Site 3	13-Feb-20	0.0	0.0	20.6	79.4
GP-B17	2.57	Site 3	03-Feb-21	0.0	0.5	21.9	77.6
GP-B17	2.60	Site 3	25-Jan-22	0.0	0.2	21.6	78.2
GP-B17	2.44	Site 3	20-Mar-23	0.0	1.0	18.8	80.2
GP-B17	2.41	Site 3	22-Feb-24	0.0	0.0	21.5	78.5
GP-B17	2.69	Site 3	19-Sep-24	0.2	0.0	20.7	79.1
GP-B17	2.70	Site 3	24-Sep-24	0.3	0.7	20.4	78.6
GP-B18		Site 7	28-Jun-12	0.0	0.2	19.0	80.8
GP-B18		Site 7	18-Oct-12	0.0	1.3	18.9	79.8
GP-B18	1.69	Site 7	03-Dec-12	0.1	0.8	20.2	78.9
GP-B18	1.69	Site 7	18-Dec-12	0.1	0.8	20.0	79.1
GP-B18	1.54	Site 7	04-Apr-13	0.0	0.9	20.0	79.1
GP-B18	1.64	Site 7	20-Jun-13	0.0	2.1	17.5	80.4
GP-B18		Site 7	22-Aug-13	0.0	1.5	19.8	78.7
GP-B18	1.76	Site 7	10-Oct-13	0.0	1.7	20.0	78.3
GP-B18	1.69	Site 7	12-Dec-13	0.0	0.7	20.8	78.5
GP-B18	1.86	Site 7	12-Feb-14	0.0	0.9	22.7	76.4
GP-B18	1.63	Site 7	27-Nov-14	0.0	0.7	21.5	77.8
GP-B18	1.87	Site 7	11-Mar-15	0.1	0.7	22.1	77.1
GP-B18	1.89	Site 7	18-Sep-15	0.0	1.7	19.3	79.0
GP-B18	1.39	Site 7	28-Feb-17	0.0	0.1	21.5	78.4
GP-B18	1.53	Site 7	28-Feb-18	0.1	0.1	20.6	79.2
GP-B18	1.66	Site 7	01-Apr-19	0.0	0.1	20.7	79.2
GP-B18	1.92	Site 7	20-Aug-19	0.1	0.6	18.6	80.8
GP-B18	1.66	Site 7	13-Feb-20	0.0	0.3	19.5	80.2
GP-B18	1.75	Site 7	03-Feb-21	0.0	0.4	21.9	77.7
GP-B18	1.79	Site 7	25-Jan-22	0.0	0.3	21.4	78.3
GP-B18	1.64	Site 7	20-Mar-23	0.0	0.5	20.3	79.2
GP-B18	1.57	Site 7	22-Feb-24	0.0	0.0	21.5	78.5
GP-B18	1.87	Site 7	19-Sep-24	0.3	0.0	20.6	79.1
GP-B18	1.87	Site 7	24-Sep-24	0.3	0.4	20.1	79.2

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

				Landfill Gas Readings - GEM 2000			
Well ID	Water (mbgs)	Site	Sample Date	CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B19		Site 7	28-Jun-12	0.0	0.1	18.9	81.0
GP-B19		Site 7	18-Oct-12	0.0	0.0	20.5	79.5
GP-B19	0.51	Site 7	03-Dec-12	0.0	0.0	21.2	78.8
GP-B19	0.55	Site 7	18-Dec-12	0.0	0.1	21.5	78.4
GP-B19	0.59	Site 7	04-Apr-13	0.0	0.0	20.8	79.2
GP-B19	0.67	Site 7	20-Jun-13	0.0	0.0	19.7	80.3
GP-B19	0.98	Site 7	22-Aug-13	0.0	0.9	19.2	79.9
GP-B19	0.82	Site 7	10-Oct-13	0.0	0.1	21.5	78.4
GP-B19	0.80	Site 7	12-Dec-13	0.0	0.1	21.2	78.7
GP-B19	0.85	Site 7	12-Feb-14	0.0	0.2	21.1	78.7
GP-B19	0.76	Site 7	27-Nov-14	0.0	0.2	22.0	77.8
GP-B19	0.75	Site 7	11-Mar-15	0.0	0.1	22.8	77.1
GP-B19	0.97	Site 7	18-Sep-15	0.0	0.1	21.2	78.7
GP-B19	0.68	Site 7	28-Feb-17	0.0	0.1	21.5	78.4
GP-B19	0.70	Site 7	28-Feb-18	0.1	0.0	21.0	78.9
GP-B19	0.59	Site 7	01-Apr-19	0.1	0.1	20.4	79.4
GP-B19	1.00	Site 7	20-Aug-19	0.1	1.6	17.2	81.1
GP-B19	1.08	Site 7	29-Aug-19	0.0	2.0	17.3	80.7
GP-B19	0.80	Site 7	13-Feb-20	0.0	0.0	20.1	79.9
GP-B19	0.87	Site 7	03-Feb-21	0.0	0.0	21.4	78.6
GP-B19	0.89	Site 7	25-Jan-22	0.0	0.1	21.9	78.8
GP-B19	0.77	Site 7	20-Mar-23	0.0	0.0	21.1	78.9
GP-B19	0.76	Site 7	22-Feb-24	0.0	0.0	21.4	78.6
GP-B19	0.95	Site 7	24-Sep-24	0.3	0.0	20.6	79.1
GP-B20	3.66	Site 1	22-Aug-13	0.0	1.1	19.1	79.8
GP-B20	3.67	Site 1	10-Oct-13	0.0	0.8	20.4	78.9
GP-B20	3.66	Site 1	12-Dec-13	0.0	0.3	22.8	77.2
GP-B20	3.80	Site 1	25-Feb-14	0.0	0.6	21.6	77.8
GP-B20	3.68	Site 1	25-Nov-14	0.0	0.5	20.4	79.1
GP-B20	3.59	Site 1	27-Nov-14	0.0	0.5	21.2	78.3
GP-B20		Site 1	11-Mar-15	Well Buried- No Reading Taken			
GP-B20	3.75	Site 1	18-Sep-15	0.0	1.1	20.2	78.7
GP-B20	3.47	Site 1	28-Feb-17	0.0	0.5	20.6	78.9
GP-B20	3.30	Site 1	23-Feb-18	0.0	0.0	22.6	77.4
GP-B20	3.62	Site 1	01-Apr-19	0.0	0.0	20.6	79.4
GP-B20	3.65	Site 1	20-Aug-19	0.1	0.9	18.4	80.6
GP-B20	3.70	Site 1	29-Aug-19	0.0	1.1	18.2	80.7
GP-B20	3.62	Site 1	13-Feb-20	0.0	0.1	19.8	80.1
GP-B20	3.67	Site 1	03-Mar-21	0.0	0.3	21.3	78.4
GP-B20	3.65	Site 1	24-Feb-22	0.0	0.5	20.0	79.5
GP-B20	3.55	Site 1	20-Mar-23	0.0	0.1	21.3	78.6
GP-B20	3.71	Site 1	22-Feb-24	0.0	0.0	21.4	78.6
GP-B20	3.61	Site 1	19-Sep-24	0.0	0.9	19.1	80.0

Table 7
Landfill Gas Concentrations (% methane by volume)
Bunker's Creek Landfills

Well ID	Water (mbgs)	Site	Sample Date	Landfill Gas Readings - GEM 2000			
				CH4 (%)	CO2 (%)	O2 (%)	Bal. (%)
GP-B21	3.83	Site 1	22-Aug-13	0.0	1.0	19.9	79.1
GP-B21	3.80	Site 1	10-Oct-13	0.0	0.7	20.8	78.5
GP-B21	3.39	Site 1	12-Dec-13	0.0	0.5	22.7	76.8
GP-B21	3.89	Site 1	12-Feb-14	0.0	0.6	22.6	76.8
GP-B21	3.80	Site 1	27-Nov-14	0.0	0.7	21.5	77.8
GP-B21	3.94	Site 1	12-Mar-15	0.0	0.5	22.2	77.3
GP-B21	3.89	Site 1	18-Sep-15	0.0	0.8	20.2	79.0
GP-B21	3.64	Site 1	28-Feb-17	0.0	0.5	20.5	79.0
GP-B21	3.77	Site 1	23-Feb-18	0.2	0.1	21.4	78.3
GP-B21	3.81	Site 1	01-Apr-19	0.0	0.7	19.1	80.2
GP-B21	4.12	Site 1	20-Aug-19	0.1	0.8	18.7	80.4
GP-B21	3.76	Site 1	13-Feb-20	0.0	0.0	20.6	79.4
GP-B21	3.78	Site 1	03-Feb-21	0.0	0.5	21.3	78.2
GP-B21	4.12	Site 1	25-Jan-22	0.0	0.3	21.3	78.4
GP-B21	4.12	Site 1	20-Mar-23	0.0	0.4	20.3	79.3
GP-B21	4.12	Site 1	22-Feb-24	0.0	0.0	19.5	80.5
GP-B21	4.12	Site 1	19-Sep-24	0.0	0.4	20.1	79.5
GP-B22	2.09	Site 1	22-Aug-13	0.0	1.1	19.7	79.2
GP-B22	2.03	Site 1	10-Oct-13	0.1	0.2	21.6	78.1
GP-B22	1.96	Site 1	12-Dec-13	0.0	0.2	20.9	78.9
GP-B22	2.12	Site 1	25-Feb-14	0.0	0.5	22.0	77.5
GP-B22	1.98	Site 1	25-Nov-14	0.0	0.6	21.0	78.4
GP-B22	2.16	Site 1	12-Mar-15	0.0	0.1	21.3	78.6
GP-B22	2.11	Site 1	18-Sep-15	0.0	0.1	20.0	79.9
GP-B22	1.71	Site 1	28-Feb-17	0.0	0.4	21.1	78.5
GP-B22	1.92	Site 1	23-Feb-18	0.0	0.0	21.4	78.6
GP-B22	1.89	Site 1	01-Apr-19	0.0	0.0	20.8	79.2
GP-B22	2.15	Site 1	20-Aug-19	0.0	1.8	17.5	80.7
GP-B22	1.89	Site 1	13-Feb-20	0.0	0.2	19.7	80.1
GP-B22	2.00	Site 1	03-Feb-21	0.0	0.5	20.0	79.5
GP-B22	1.94	Site 1	17-Feb-22	0.0	0.1	21.5	78.4
GP-B22	1.85	Site 1	20-Mar-23	0.0	0.1	21.0	78.9
GP-B22	1.95	Site 1	22-Feb-24	0.0	0.0	20.5	79.5
GP-B22	2.08	Site 1	19-Sep-24	0.0	0.2	20.5	79.3
GP-B24	1.61	Site 1	20-Dec-17	0.0	0.5	20.4	79.1
GP-B24	1.52	Site 1	27-Mar-18	0.0	0.7	19.0	80.3
GP-B24	1.41	Site 1	01-Apr-19	0.0	0.2	20.1	79.7
GP-B24	1.63	Site 1	20-Aug-19	0.1	1.0	17.3	81.6
GP-B24	1.72	Site 1	29-Aug-19	0.0	1.4	18.4	80.2
GP-B24	1.42	Site 1	13-Feb-20	0.0	0.0	20.4	79.6
GP-B24	1.58	Site 1	03-Feb-21	0.0	0.5	21.0	78.5
GP-B24	1.59	Site 1	24-Feb-22	0.0	0.9	18.4	80.7
GP-B24	1.40	Site 1	20-Mar-23	0.0	1.1	18.9	80.0
GP-B24	1.50	Site 1	22-Feb-24	0.0	0.0	20.5	79.5
GP-B24	1.62	Site 1	19-Sep-24	0.0	1.2	19.4	79.4

Notes:

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

APPENDIX A

2024 Sampling Locations

City of Barrie Bunker's Creek Landfills
2024 Sampling Locations and Elevations

Well	Monitoring Pipe Elevations (masl)	Ground Surface Elevations (masl)	Well Screen Elevations (masl)	
			Top of Screen (masl)	Bottom of Screen (masl)
Site 1				
GP-B1	228.52	227.60	226.41	224.89
GP-B8	226.65	226.75	225.83	222.79
GP-B20	228.29	228.43	226.90	223.85
GP-B21	228.71	227.66	226.59	223.54
GP-B24	225.39	224.54	223.79	222.27
Site 2				
GP-B3	226.07	225.07	224.46	222.94
GP-B22	225.01	225.11	224.35	221.30
Site 3				
GP-B14	224.81	224.06	223.30	221.77
GP-B17	225.85	224.94	223.87	222.35
Site 7				
GP-B7	221.43	220.34	219.57	218.05
GP-B18	224.53	223.58	222.05	220.53
GP-B19	222.62	221.84	221.08	219.56

APPENDIX B

Groundwater Elevations

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B1	228.52	227.60	3.69	2.78	1.52	226.35	224.83	2012-09-17	dry	dry	NA
								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
								2013-10-10	dry	dry	NA
								2013-12-12	dry	dry	NA
								2014-02-12	dry	dry	NA
								2014-11-27	dry	dry	NA
								2015-03-11	dry	dry	NA
								2015-09-18	dry	dry	NA
								2016-03-14	3.58	2.70	224.83
								2017-02-28	3.66	2.78	224.75
								2018-02-23	dry	dry	NA
								2018-02-23	dry	dry	NA
								2019-04-01	dry	dry	NA
								2019-08-20	dry	dry	NA
								2020-02-13	3.60	2.72	224.82
								2021-02-03	dry	dry	NA
								2022-02-24	dry	dry	NA
								2023-03-20	dry	dry	NA
								2024-02-22	dry	dry	NA
								2024-09-19	Destroyed in Fire		
GP-B3	226.03	225.07	3.09	2.13	1.52	224.46	222.94	2012-09-17	dry	dry	NA
								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
								2013-10-10	dry	dry	NA
								2013-12-12	dry	dry	NA
								2014-02-12	dry	dry	NA
								2014-11-27	dry	dry	NA
								2015-03-12	dry	dry	NA
								2015-09-18	dry	dry	NA
								2016-03-14	dry	dry	NA
								2017-02-28	dry	dry	NA
								2018-02-28	2.73	1.78	223.30
								2019-04-01	2.99	2.03	223.05
								2019-08-20	dry	dry	NA
								2020-02-13	2.95	1.99	223.08
								2021-02-03	dry	dry	NA
								2022-02-24	dry	dry	NA
								2023-03-30	dry	dry	NA
								2024-02-22	dry	dry	NA
								2024-09-19	dry	dry	NA

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B7	221.43	220.34	3.38	2.29	1.52	219.57	218.05	2012-09-17	2.20	1.11	219.23
								2012-12-03	2.19	1.10	219.23
								2012-12-18	2.21	1.12	219.21
								2013-04-04	2.19	1.11	219.23
								2013-06-20	2.16	1.07	219.26
								2013-08-22	1.94	0.85	219.49
								2013-10-10	1.92	0.83	219.51
								2013-12-12	2.10	1.01	219.32
								2014-02-12	2.11	1.02	219.32
								2014-11-27	2.18	1.09	219.25
								2015-03-11	2.24	1.15	219.19
								2015-09-18	2.28	1.19	219.15
								2017-02-28	2.23	1.14	219.20
								2018-02-23	2.06	0.97	219.36
								2019-04-01	2.18	1.09	219.25
								2019-08-20	2.24	1.15	219.18
								2020-02-13	2.22	1.13	219.21
								2021-02-03	2.21	1.12	219.21
								2022-01-25	2.28	1.19	219.14
								2023-03-20	2.15	1.06	219.28
								2024-02-22	1.91	0.82	219.52
								2024-09-19	2.23	1.14	219.20
GP-B8	226.65	226.75	3.86	3.96	3.05	225.83	222.79	2012-12-03	3.33	3.43	223.32
								2012-12-18	3.30	3.40	223.35
								2013-04-04	3.24	3.34	223.41
								2013-06-20	3.24	3.34	223.41
								2013-08-22	Not Accessible	NA	NA
								2013-10-10	3.35	3.45	223.30
								2013-12-12	3.32	3.42	223.33
								2014-02-13	3.43	3.53	223.22
								2014-11-25	Damaged	NA	NA
								2014-11-27	3.55	3.65	223.10
								2015-03-12	3.49	3.59	223.16
								2015-09-18	3.43	3.53	223.22
								2016-03-14	Frozen @ 0.26	NA	NA
								2017-02-28	Frozen @ TOP	NA	NA
								2017-03-20	0.22	0.32	226.43
								2018-02-23	3.34	3.44	223.31
								2019-04-01	1.85	1.96	224.79
								2019-08-20	3.46	3.56	223.19
								2020-02-13	1.84	1.94	224.81
								2021-02-24	3.41	3.51	223.23
								2022-02-17	3.37	3.47	223.28
								2023-03-20	3.29	3.39	223.36
								2024-02-22	3.33	3.43	223.32
								2024-09-19	3.38	3.48	223.27

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B14	224.81	224.06	3.03	2.29	1.52	223.30	221.77	2012-12-03	2.32	1.57	222.49
								2012-12-18	2.30	1.56	222.50
								2013-04-04	2.17	1.42	222.64
								2013-06-20	2.29	1.54	222.52
								2013-08-22	2.45	1.70	222.36
								2013-10-10	2.33	1.59	222.48
								2013-12-12	2.31	1.57	222.50
								2014-02-12	2.46	1.72	222.34
								2014-11-27	2.22	1.47	222.59
								2015-03-11	2.63	1.89	222.18
								2015-09-18	2.64	1.89	222.17
								2017-02-28	2.23	1.49	222.58
								2018-02-28	2.51	1.76	222.30
								2019-04-01	2.47	1.72	222.34
								2019-08-20	2.74	1.99	222.07
								2020-02-13	2.43	1.69	222.38
								2021-02-03	2.60	1.86	222.20
								2022-01-25	2.63	1.89	222.18
								2023-03-20	2.42	1.68	222.39
								2024-02-22	2.50	1.75	222.31
								2024-09-19	2.77	2.03	222.04
GP-B17	225.85	224.94	3.65	2.75	1.52	223.72	222.20	2012-12-03	3.50	2.59	222.35
								2012-12-18	3.48	2.57	222.37
								2013-04-04	3.29	2.39	222.56
								2013-06-20	3.38	2.48	222.46
								2013-08-22	3.61	2.70	222.24
								2013-10-10	3.52	2.61	222.33
								2013-12-12	3.43	2.53	222.42
								2014-02-12	3.65	2.74	222.20
								2014-11-27	3.42	2.51	222.43
								2015-03-11	3.53	2.63	222.32
								2015-09-18	3.58	2.68	222.26
								2017-02-28	3.13	2.22	222.72
								2018-02-28	3.40	2.50	222.44
								2019-04-01	3.34	2.43	222.51
								2019-08-20	3.65	2.75	222.20
								2020-02-13	3.31	2.40	222.54
								2021-02-03	3.47	2.57	222.37
								2022-01-25	3.50	2.60	222.35
								2023-03-20	3.35	2.44	222.50
								2024-02-22	3.32	2.41	222.53
								2024-09-19	3.59	2.69	222.26
								2024-09-24	3.60	2.70	222.25

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B18	224.53	223.58	4.00	3.05	1.52	222.05	220.53	2012-09-17	2.92	1.97	221.61
								2012-12-03	2.64	1.69	221.89
								2012-12-18	2.64	1.69	221.89
								2013-04-04	2.50	1.54	222.04
								2013-06-20	2.59	1.64	221.94
								2013-08-22	dry	dry	NA
								2013-10-10	2.72	1.76	221.82
								2013-12-12	2.65	1.69	221.89
								2014-02-12	2.81	1.86	221.72
								2014-11-27	2.59	1.63	221.95
								2015-03-11	2.82	1.87	221.71
								2015-09-18	2.84	1.89	221.69
								2017-02-28	2.34	1.39	222.19
								2018-02-28	2.48	1.53	222.05
								2019-04-01	2.61	1.66	221.92
								2019-08-20	2.87	1.92	221.66
								2020-02-13	2.61	1.66	221.92
								2021-02-03	2.70	1.75	221.83
								2022-01-25	2.75	1.79	221.79
								2023-03-20	2.59	1.64	221.94
								2024-02-22	2.52	1.57	222.01
								2024-09-19	2.82	1.87	221.71
								2024-09-24	2.82	1.87	221.71
GP-B19	222.62	221.84	3.07	2.29	1.52	221.08	219.56	2012-09-17	1.62	0.84	221.00
								2012-12-03	1.29	0.51	221.34
								2012-12-18	1.34	0.55	221.29
								2013-04-04	1.37	0.59	221.26
								2013-06-20	1.45	0.67	221.17
								2013-08-22	1.76	0.98	220.86
								2013-10-10	1.60	0.82	221.02
								2013-12-12	1.58	0.80	221.04
								2014-02-12	1.63	0.85	220.99
								2014-11-27	1.54	0.76	221.08
								2015-03-11	1.53	0.75	221.09
								2015-09-18	1.75	0.97	220.87
								2017-02-28	1.46	0.68	221.16
								2018-02-28	1.48	0.70	221.14
								2019-04-01	1.37	0.59	221.25
								2019-08-20	1.78	1.00	220.84
								2019-08-29	1.86	1.08	220.76
								2020-02-13	1.58	0.80	221.04
								2021-02-03	1.65	0.87	220.97
								2022-01-25	1.67	0.89	220.95
								2023-03-20	1.55	0.77	221.07
								2024-02-22	1.54	0.76	221.08
								2024-09-24	1.73	0.95	220.89

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B20	228.29	228.43	4.43	4.57	3.05	226.90	223.85	2013-08-22	3.52	3.66	224.77
								2013-10-10	3.53	3.67	224.76
								2013-12-12	3.52	3.66	224.77
								2014-02-25	3.66	3.80	224.63
								2014-11-25	3.54	3.68	224.75
								2014-11-27	3.45	3.59	224.84
								2015-03-11	Buried	NA	NA
								2015-09-18	3.61	3.75	224.68
								2017-02-28	3.33	3.47	224.95
								2018-02-23	3.16	3.30	225.13
								2019-04-01	3.48	3.62	224.80
								2019-08-20	3.51	3.65	224.78
								2019-08-29	3.56	3.70	224.72
								2020-02-13	3.48	3.62	224.80
								2021-03-03	3.53	3.67	224.75
								2022-02-24	3.51	3.65	224.78
								2023-03-20	3.42	3.55	224.87
								2024-02-22	3.57	3.71	224.72
								2024-09-19	3.47	3.61	224.82
GP-B21	228.71	227.66	5.17	4.12	3.05	226.59	223.54	2013-08-22	4.88	3.83	223.83
								2013-10-10	4.86	3.80	223.85
								2013-12-12	4.44	3.39	224.27
								2014-02-12	4.95	3.89	223.76
								2014-11-27	4.85	3.80	223.86
								2015-03-12	4.99	3.94	223.72
								2015-09-18	4.94	3.89	223.77
								2017-02-28	4.69	3.64	224.02
								2018-02-23	4.82	3.77	223.89
								2019-04-01	4.86	3.81	223.85
								2019-08-20	dry	dry	NA
								2020-02-13	4.82	3.76	223.90
								2021-02-03	4.83	3.78	223.88
								2022-01-25	dry	dry	NA
								2023-03-20	dry	dry	NA
								2024-02-22	dry	dry	NA
								2024-09-19	dry	dry	NA

Table B-1
Groundwater Elevations
Bunker's Creek Historic Landfill Sites

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-B22	225.01	225.11	3.71	3.81	3.05	224.35	221.30	2013-08-22	2.00	2.09	223.02
								2013-10-10	1.93	2.03	223.08
								2013-12-12	1.86	1.96	223.15
								2014-02-25	2.02	2.12	222.99
								2014-11-25	1.88	1.98	223.13
								2015-03-12	2.06	2.16	222.95
								2015-09-18	2.01	2.11	223.00
								2017-02-28	1.61	1.71	223.40
								2018-02-23	1.82	1.92	223.19
								2019-04-01	1.79	1.89	223.23
								2019-08-20	2.05	2.15	222.96
								2020-02-13	1.80	1.89	223.22
								2021-02-03	1.90	2.00	223.11
								2022-02-17	1.85	1.94	223.17
								2023-03-20	1.76	1.85	223.26
								2024-02-22	1.85	1.95	223.16
								2024-09-19	1.98	2.08	223.03
GP-B24	225.39	224.54	3.12	2.27	1.52	223.79	222.27	2017-12-20	2.47	1.61	222.93
								2018-03-27	2.38	1.52	223.02
								2019-04-01	2.27	1.41	223.13
								2019-08-20	2.49	1.63	222.90
								2019-08-29	2.58	1.72	222.81
								2020-02-13	2.28	1.42	223.11
								2021-02-03	2.44	1.58	222.95
								2022-02-24	2.45	1.59	222.95
								2023-03-20	2.26	1.40	223.14
								2024-02-22	2.36	1.50	223.03
								2024-09-19	2.48	1.62	222.91

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

APPENDIX C

Analytical Results - Surface Water



FINAL REPORT

CA14538-SEP24 R1

C A-GLD-23592540

Prepared for

WSP Canada Inc.

First Page

CLIENT DETAILS

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Project C A-GLD-23592540

Order Number

Samples Surface Water (6)

LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

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SGS Reference CA14538-SEP24

Received 09/16/2024

Approved 09/24/2024

Report Number CA14538-SEP24 R1

Date Reported 09/25/2024

COMMENTS

MAC - Maximum Acceptable Concentration

AO/OG - Aesthetic Objective / Operational Guideline

MDL - SGS Method Detection Limit

NR - Not regulated / reportable under applicable Provincial drinking water regulations as per client.

Revision 1 - metals reported as ug/L

SIGNATORIES

Brad Moore Hon. B.Sc

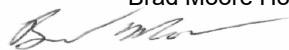




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FINAL REPORT

CA14538-SEP24 R1

Client: WSP Canada Inc.

Project: C A-GLD-23592540

Project Manager: Christi Groves

Samplers: Serena and Nicole, Serene and Nicole

MATRIX: WATER

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	9	10	11	12	13	14
Sample Name	SWB1	SWB2	SWB3	SWB4	SWB5	DUP1
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
BTEX									
Benzene	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

General Chemistry

Alkalinity	mg/L as CaCO3	2		247	259	241	271	220	294
Temperature @ pH	°C	0		20.8	18.2	20.4	20.5	20.4	20.4
Conductivity	uS/cm	2		1850	1800	1820	1640	1750	1860
Ammonia+Ammonium (N)	as N mg/L	0.1		0.4	0.2	0.2	0.2	< 0.1	0.2
Unionized Ammonia	mg/L as N	0.001	0.02	0.025	0.009	0.011	0.014	0.005	0.011

Metals and Inorganics

Sulphate	mg/L	0.2		26	27	26	28	29	27
Hardness	µg/L	50		367000	372000	357000	374000	338000	358000
Boron (total)	µg/L	2	200	22	20	19	23	18	19
Calcium (total)	µg/L	10		121000	123000	118000	123000	110000	118000
Iron (total)	µg/L	7	300	710	708	697	784	279	708
Potassium (total)	µg/L	9		2820	2790	2660	2900	2690	2740
Magnesium (total)	µg/L	1		15800	16000	15500	16200	15300	15500
Sodium (total)	µg/L	10		233000	234000	223000	249000	223000	226000



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			Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
			Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	
Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Metals and Inorganics (continued)									
Aluminum (total)	µg/L	1		13	21	19	10	11	19
Aluminum (0.2µm)	µg/L	1	75	3	4	4	13	3	3
Antimony (total)	µg/L	0.9	20	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9	< 0.9
Arsenic (total)	µg/L	0.2	5	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Barium (total)	µg/L	0.08		171	176	167	167	149	169
Beryllium (total)	µg/L	0.007	1100	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007
Bismuth (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Cadmium (total)	µg/L	0.003	0.5	0.003	0.006	0.004	0.007	0.003	0.005
Cobalt (total)	µg/L	0.004	0.9	0.11	0.12	0.10	0.11	0.081	0.11
Chromium (total)	µg/L	0.08	100	0.4	0.6	0.6	0.5	0.7	0.5
Copper (total)	µg/L	1	5	< 1	< 1	< 1	< 1	< 1	< 1
Manganese (total)	µg/L	0.01		39	39	39	42	29	40
Molybdenum (total)	µg/L	0.4	40	0.4	< 0.4	< 0.4	0.4	0.4	< 0.4
Nickel (total)	µg/L	0.1	25	0.5	0.5	0.5	0.5	0.5	0.5
Phosphorus (total)	µg/L	3	10	20	22	21	13	10	22
Lead (total)	µg/L	0.09	25	< 0.09	0.11	0.12	< 0.09	< 0.09	0.10
Lithium (total)	µg/L	0.1		3	3	3	3	2	3
Selenium (total)	µg/L	0.04	100	0.271	0.262	0.255	0.311	0.296	0.263
Silicon (total)	µg/L	20		5060	5720	5110	5400	5230	5200
Silver (total)	µg/L	0.05	0.1	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Strontium (total)	µg/L	0.08		529	546	512	587	526	520
Tellurium (total)	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



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Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
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Metals and Inorganics (continued)

Thallium (total)	µg/L	0.005	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Tin (total)	µg/L	0.06		< 0.06	< 0.06	< 0.06	< 0.06	0.30	< 0.06
Titanium (total)	µg/L	0.1		0.6	1.1	0.8	0.4	0.6	0.9
Tungsten (total)	µg/L	0.002	30	0.045	0.043	0.042	0.042	0.034	0.045
Uranium (total)	µg/L	0.01	5	0.9	0.9	0.9	1.1	1.2	0.9
Vanadium (total)	µg/L	0.2	6	0.6	0.7	0.6	0.8	0.8	0.7
Zinc (total)	µg/L	2	20	2	2	2	2	< 2	3
Zirconium (total)	µg/L	2	4	< 2	< 2	< 2	< 2	< 2	< 2

Other (ORP)

pH	No unit	0.05	8.6	8.19	8.05	8.17	8.21	8.23	8.10
Chloride	mg/L	0.2		520	590	510	540	600	530
Mercury (dissolved)	µg/L	0.01	0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

PAHs

Acenaphthene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Anthracene	µg/L	0.1	0.0008	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)anthracene	µg/L	0.1	0.0004	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(a)pyrene	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	µg/L	0.2	0.00002	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzo(k)fluoranthene	µg/L	0.1	0.0002	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1



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Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
PAHs (continued)									
Chrysene	µg/L	0.1	0.0001	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	µg/L	0.1	0.002	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	µg/L	0.1	0.0008	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	µg/L	0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
1-Methylnaphthalene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
2-Methylnaphthalene	µg/L	0.5	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	µg/L	0.5	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	µg/L	0.1	0.03	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Pyrene	µg/L	0.1		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1

PHCs

F1 (C6-C10)	µg/L	25		< 25	< 25	< 25	< 25	< 25	< 25
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25	< 25	< 25	< 25	< 25
F2 (C10-C16)	µg/L	100		< 100	< 100	< 100	< 100	< 100	< 100
F3 (C16-C34)	µg/L	200		< 200	< 200	< 200	< 200	< 200	< 200
F4 (C34-C50)	µg/L	200		< 200	< 200	< 200	< 200	< 200	< 200
Chromatogram returned to baseline at nC50	Yes / No	no		YES	YES	YES	YES	YES	YES



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				Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	
Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result	Result
SVOC Surrogates										
Surr 2-Methylnaphthalene-D10	Surr Rec %	no		75	76	76	78	69	77	
Surr Fluoranthene-D10	Surr Rec %	no		77	88	95	93	85	106	
Surr 2-Fluorobiphenyl	Surr Rec %	no		74	83	78	79	71	79	
Surr 4-Terphenyl-d14	Surr Rec %	no		88	95	103	102	94	114	
THMs (VOC)										
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Bromoform	µg/L	0.5	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
VOC Surrogates										
Surr 1,2-Dichloroethane-d4	Surr Rec %	no		104	102	103	103	104	102	
Surr 2-Bromo-1-Chloropropane	Surr Rec %	no		104	101	107	102	100	101	
Surr 4-Bromofluorobenzene	Surr Rec %	no		100	91	98	92	93	95	
VOCs										
Acetone	µg/L	30		< 30	< 30	< 30	< 30	< 30	< 30	
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Chlorobenzene	µg/L	0.5	15	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dichlorodifluoromethane	µg/L	2.0		< 2	< 2	< 2	< 2	< 2	< 2	



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				Sample Date	13/09/2024	13/09/2024	13/09/2024	13/09/2024	13/09/2024	
Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result	Result
VOCs (continued)										
1,1-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
n-Hexane	µg/L	1.0		< 1	< 1	< 1	< 1	< 1	< 1	< 1
Methyl ethyl ketone	µg/L	20	400	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20		< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	200	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methylene Chloride	µg/L	0.5	100	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5



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Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
VOCs (continued)									
Trichlorofluoromethane	µg/L	5.0		< 5	< 5	< 5	< 5	< 5	< 5
Vinyl Chloride	µg/L	0.2	600	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroform	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

EXCEEDANCE SUMMARY

PWQO_L / WATER
/ - - Table 2 -
General - July 1999
PIBS 3303E
L1

Parameter	Method	Units	Result
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SWB1

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Unionized Ammonia	N/A - Calculation	mg/L as N	0.025	0.02
Iron	SM 3030/EPA 200.8	µg/L	710	300
Phosphorus	SM 3030/EPA 200.8	µg/L	20	10

SWB2

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	708	300
Phosphorus	SM 3030/EPA 200.8	µg/L	22	10

SWB3

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	697	300
Phosphorus	SM 3030/EPA 200.8	µg/L	21	10

SWB4

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001

EXCEEDANCE SUMMARY

PWQO_L / WATER

/ - - Table 2 -

General - July 1999

PIBS 3303E

Parameter	Method	Units	Result	L1
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SWB4 (continued)

Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	784	300
Phosphorus	SM 3030/EPA 200.8	µg/L	13	10

SWB5

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03

DUP1

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03
Iron	SM 3030/EPA 200.8	µg/L	708	300
Phosphorus	SM 3030/EPA 200.8	µg/L	22	10



FINAL REPORT

CA14538-SEP24 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0333-SEP24	mg/L as CaCO3	2	< 2	1	20	102	80	120	NA		
Alkalinity	EWL0334-SEP24	mg/L as CaCO3	2	< 2	4	20	96	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-~~I~~ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0170-SEP24	as N mg/L	0.1	<0.1	0	10	100	90	110	100	75	125
Ammonia+Ammonium (N)	SKA0172-SEP24	as N mg/L	0.1	<0.1	ND	10	100	90	110	101	75	125



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CA14538-SEP24 R1

QC SUMMARY

Anions by IC
Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	90	90	110	91	75	125
Chloride	DIO0375-SEP24	mg/L	0.2	<0.2	1	20	102	90	110	87	75	125
Sulphate	DIO0375-SEP24	mg/L	0.2	<0.2	20	20	94	90	110	89	75	125
Sulphate	DIO0395-SEP24	mg/L	0.2	<0.2	2	20	94	90	110	98	75	125
Chloride	DIO0427-SEP24	mg/L	0.2	<0.2	ND	20	101	90	110	111	75	125

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0333-SEP24	uS/cm	2	< 2	1	20	99	90	110	NA		
Conductivity	EWL0334-SEP24	uS/cm	2	< 2	0	20	99	90	110	NA		



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QC SUMMARY

Mercury by CVAAS
Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (dissolved)	EHG0028-SEP24	mg/L	0.01	< 0.00001	ND	20	118	80	120	130	70	130



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QC SUMMARY

Metals in aqueous samples - ICP-MS
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0165-SEP24	mg/L	0.05	<0.00005	ND	20	96	90	110	74	70	130
Aluminum (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Aluminum (0.2µm)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Arsenic (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	99	90	110	114	70	130
Barium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	12	20	99	90	110	104	70	130
Beryllium (total)	EMS0165-SEP24	mg/L	0.007	<0.000007	ND	20	96	90	110	98	70	130
Boron (total)	EMS0165-SEP24	mg/L	2	<0.002	1	20	98	90	110	93	70	130
Bismuth (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	ND	20	100	90	110	91	70	130
Calcium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	102	90	110	100	70	130
Cadmium (total)	EMS0165-SEP24	mg/L	0.003	<0.000003	11	20	102	90	110	102	70	130
Cobalt (total)	EMS0165-SEP24	mg/L	0.004	<0.000004	4	20	98	90	110	100	70	130
Chromium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	10	20	103	90	110	100	70	130
Copper (total)	EMS0165-SEP24	mg/L	1	<0.001	1	20	100	90	110	100	70	130
Iron (total)	EMS0165-SEP24	mg/L	7	<0.007	0	20	102	90	110	100	70	130
Potassium (total)	EMS0165-SEP24	mg/L	9	<0.009	4	20	106	90	110	109	70	130
Lithium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	13	20	97	90	110	105	70	130
Magnesium (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	129	70	130
Manganese (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	6	20	100	90	110	103	70	130
Molybdenum (total)	EMS0165-SEP24	mg/L	0.4	<0.0004	17	20	103	90	110	110	70	130
Sodium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	100	90	110	99	70	130



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QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nickel (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	7	20	103	90	110	106	70	130
Lead (total)	EMS0165-SEP24	mg/L	0.09	<0.00009	10	20	96	90	110	93	70	130
Phosphorus (total)	EMS0165-SEP24	mg/L	3	<0.003	0	20	101	90	110	NV	70	130
Antimony (total)	EMS0165-SEP24	mg/L	0.9	<0.0009	ND	20	101	90	110	108	70	130
Selenium (total)	EMS0165-SEP24	mg/L	0.04	<0.00004	3	20	100	90	110	114	70	130
Silicon (total)	EMS0165-SEP24	mg/L	20	<0.02	5	20	99	90	110	NV	70	130
Tin (total)	EMS0165-SEP24	mg/L	0.06	<0.00006	4	20	102	90	110	NV	70	130
Strontium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	5	20	101	90	110	98	70	130
Tellurium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	ND	20	101	90	110	NV	70	130
Titanium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	3	20	101	90	110	NV	70	130
Thallium (total)	EMS0165-SEP24	mg/L	0.005	<0.000005	ND	20	99	90	110	94	70	130
Uranium (total)	EMS0165-SEP24	mg/L	0.01	<0.000002	9	20	100	90	110	97	70	130
Vanadium (total)	EMS0165-SEP24	mg/L	0.2	<0.00001	7	20	100	90	110	109	70	130
Tungsten (total)	EMS0165-SEP24	mg/L	0.002	<0.0002	ND	20	100	90	110	NV	70	130
Zinc (total)	EMS0165-SEP24	mg/L	2	<0.002	4	20	99	90	110	106	70	130
Zirconium (total)	EMS0165-SEP24	mg/L	2	<0.002	ND	20	103	90	110	NV	70	130
Aluminum (0.2µm)	EMS0228-SEP24	mg/L	1	<0.001	4	20	101	90	110	98	70	130
Aluminum (0.2µm)	EMS0236-SEP24	mg/L	1	<0.001	3	20	97	90	110	101	70	130



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CA14538-SEP24 R1

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-IENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F1 (C6-C10)	GCM0268-SEP24	µg/L	25	<25	ND	30	98	60	140	109	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-IENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F2 (C10-C16)	GCM0214-SEP24	µg/L	100	<100	ND	30	73	60	140	86	60	140
F3 (C16-C34)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140
F4 (C34-C50)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140



QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-|ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0333-SEP24	No unit	0.05	NA	0		100			NA		
pH	EWL0334-SEP24	No unit	0.05	NA	0		100			NA		



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QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0231-SEP24	ug/L	0.5	< 0.5	ND	30	104	50	140	98	50	140
2-Methylnaphthalene	GCM0231-SEP24	µg/L	0.5	< 0.5	ND	30	103	50	140	98	50	140
Acenaphthene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	96	50	140	101	50	140
Acenaphthylene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	89	50	140	94	50	140
Anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	105	50	140	97	50	140
Benzo(a)anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	97	50	140	101	50	140
Benzo(a)pyrene	GCM0231-SEP24	ug/L	0.01	< 0.01	ND	30	107	50	140	106	50	140
Benzo(b+j)fluoranthene	GCM0231-SEP24	ug/L	0.1	< 0.1	ND	30	111	50	140	110	50	140
Benzo(ghi)perylene	GCM0231-SEP24	µg/L	0.2	< 0.2	ND	30	108	50	140	97	50	140
Benzo(k)fluoranthene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	112	50	140	112	50	140
Chrysene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	99	50	140	100	50	140
Dibenzo(a,h)anthracene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	109	50	140	102	50	140
Fluoranthene	GCM0231-SEP24	ug/L	0.1	< 0.1	ND	30	91	50	140	96	50	140
Fluorene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	100	50	140	96	50	140
Indeno(1,2,3-cd)pyrene	GCM0231-SEP24	µg/L	0.2	< 0.2	ND	30	109	50	140	95	50	140
Naphthalene	GCM0231-SEP24	µg/L	0.5	< 0.5	ND	30	103	50	140	93	50	140
Phenanthrene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	108	50	140	100	50	140
Pyrene	GCM0231-SEP24	µg/L	0.1	< 0.1	ND	30	95	50	140	98	50	140



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CA14538-SEP24 R1

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	117	50	140
1,1,1-Trichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	109	50	140
1,1,2,2-Tetrachloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	113	60	130	117	50	140
1,1,2-Trichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	117	50	140
1,1-Dichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	114	60	130	114	50	140
1,1-Dichloroethylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	118	60	130	111	50	140
1,2-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	116	50	140
1,2-Dichloroethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	111	50	140
1,2-Dichloropropane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	115	50	140
1,3-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	109	60	130	115	50	140
1,4-Dichlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	116	50	140
Acetone	GCM0275-SEP24	ug/L	30	<30	ND	30	107	50	140	105	50	140
Benzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	116	60	130	112	50	140
Bromodichloromethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	112	50	140
Bromoform	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	107	60	130	111	50	140
Bromomethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	104	50	140	102	50	140
Carbon tetrachloride	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	110	60	130	112	50	140
Chlorobenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	116	50	140
Chloroform	GCM0275-SEP24	ug/L	0.5	<0.5	ND	30	113	60	130	113	50	140
cis-1,2-Dichloroethene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	115	60	130	113	50	140



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QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	108	50	140
Dibromochloromethane	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	113	50	140
Dichlorodifluoromethane	GCM0275-SEP24	µg/L	2.0	<2	ND	30	84	50	140	82	50	140
Ethylbenzene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	117	50	140
Ethylenedibromide	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	114	60	130	109	50	140
n-Hexane	GCM0275-SEP24	µg/L	1.0	<1	ND	30	99	60	130	98	50	140
m/p-xylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	117	50	140
Methyl ethyl ketone	GCM0275-SEP24	ug/L	20	<20	ND	30	112	60	130	104	50	140
Methyl Isobutyl Ketone	GCM0275-SEP24	µg/L	20	<20	ND	30	107	50	140	104	50	140
Methyl-t-butyl Ether	GCM0275-SEP24	µg/L	2.0	<2	ND	30	96	60	130	93	50	140
Methylene Chloride	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	113	60	130	110	50	140
o-xylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	114	50	140
Styrene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	117	50	140
Tetrachloroethylene (perchloroethylene)	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	111	50	140
Toluene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	112	60	130	115	50	140
trans-1,2-Dichloroethene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	111	50	140
trans-1,3-Dichloropropene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	111	60	130	115	50	140
Trichloroethylene	GCM0275-SEP24	µg/L	0.5	<0.5	ND	30	110	60	130	111	50	140
Trichlorofluoromethane	GCM0275-SEP24	µg/L	5.0	<5	ND	30	117	50	140	114	50	140
Vinyl Chloride	GCM0275-SEP24	µg/L	0.2	<0.2	ND	30	105	50	140	109	50	140



QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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This report supersedes all previous versions.

-- End of Analytical Report --



FINAL REPORT

CA14539-SEP24 R1

C A-GLD-23592540

Prepared for

WSP Canada Inc.

First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	WSP Canada Inc.	Project Specialist	Brad Moore Hon. B.Sc
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Project	C A-GLD-23592540	Received	09/16/2024
Order Number		Approved	09/23/2024
Samples	Surface Water (2)	Report Number	CA14539-SEP24 R1
		Date Reported	09/25/2024

COMMENTS

Revision 1 - Metals reported as ug/L

SIGNATORIES

Brad Moore Hon. B.Sc

Brad Moore



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FINAL REPORT

CA14539-SEP24 R1

Client: WSP Canada Inc.

Project: C A-GLD-23592540

Project Manager: Christi Groves

Samplers: NA

MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
BTEX					
Benzene	µg/L	0.5	100	< 0.5	< 0.5
Ethylbenzene	µg/L	0.5	8	< 0.5	< 0.5
Toluene	µg/L	0.5	0.8	< 0.5	< 0.5
Xylene (total)	µg/L	0.5		< 0.5	< 0.5
m/p-xylene	µg/L	0.5	2	< 0.5	< 0.5
o-xylene	µg/L	0.5	40	< 0.5	< 0.5

General Chemistry

Alkalinity	mg/L as CaCO ₃	2		3	---
Temperature @ pH	°C	0		20.7	---
Conductivity	uS/cm	2		4	---
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	---
Unionized Ammonia	mg/L as N	0.001	0.02	< 0.001	---

Metals and Inorganics

Sulphate	mg/L	0.2		< 0.2	---
Hardness	µg/L	50		< 50	---
Calcium (total)	µg/L	10		< 10	---
Iron (total)	µg/L	7	300	< 7	---
Potassium (total)	µg/L	9		< 9	---
Magnesium (total)	µg/L	1		1	---
Sodium (total)	µg/L	10		< 10	---
Aluminum (total)	µg/L	1		< 1	---



FINAL REPORT

CA14539-SEP24 R1

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christi Groves
Samplers: NA

MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQQ_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Aluminum (0.2µm)	µg/L	1	75	14	---
Antimony (total)	µg/L	0.9	20	< 0.9	---
Arsenic (total)	µg/L	0.2	5	< 0.2	---
Barium (total)	µg/L	0.08		< 0.08	---
Beryllium (total)	µg/L	0.007	11	< 0.007	---
Boron (total)	µg/L	2	200	< 2	---
Cadmium (total)	µg/L	0.003	0.1	< 0.003	---
Cobalt (total)	µg/L	0.004	0.9	< 0.004	---
Chromium (total)	µg/L	0.08	100	< 0.08	---
Copper (total)	µg/L	1	5	< 1	---
Manganese (total)	µg/L	0.01		< 0.01	---
Molybdenum (total)	µg/L	0.4	40	< 0.4	---
Nickel (total)	µg/L	0.1	25	< 0.1	---
Phosphorus (total)	µg/L	3	10	< 3	---
Lead (total)	µg/L	0.09	5	< 0.09	---
Lithium (total)	µg/L	0.1		< 0.1	---
Selenium (total)	µg/L	0.04	100	< 0.04	---
Silicon (total)	µg/L	20		< 20	---
Silver (total)	µg/L	0.05	0.1	< 0.05	---
Strontium (total)	µg/L	0.08		< 0.08	---
Tellurium (total)	µg/L	0.1		< 0.1	---
Thallium (total)	µg/L	0.005	0.3	< 0.005	---



FINAL REPORT

CA14539-SEP24 R1

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Project Manager: Christi Groves
Samplers: NA

MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Tin (total)	µg/L	0.06		< 0.06	---
Titanium (total)	µg/L	0.1		< 0.1	---
Uranium (total)	µg/L	0.002	5	< 0.002	---
Vanadium (total)	µg/L	0.01	6	< 0.01	---
Tungsten (total)	µg/L	0.2	30	< 0.2	---
Zinc (total)	µg/L	2	20	< 2	---
Zirconium (total)	µg/L	2	4	< 2	---
Other (ORP)					
pH	No unit	0.05	8.6	6.79	---
Chloride	mg/L	0.2		< 0.2	---
Mercury (dissolved)	µg/L	0.01	0.2	< 0.01	---
PAHs					
Acenaphthene	µg/L	0.1		< 0.1	---
Acenaphthylene	µg/L	0.1		< 0.1	---
Anthracene	µg/L	0.1	0.0008	< 0.1	---
Benzo(a)anthracene	µg/L	0.1	0.0004	< 0.1	---
Benzo(a)pyrene	µg/L	0.01		< 0.01	---
Benzo(b+j)fluoranthene	µg/L	0.1		< 0.1	---
Benzo(ghi)perylene	µg/L	0.2	0.00002	< 0.2	---
Benzo(k)fluoranthene	µg/L	0.1	0.0002	< 0.1	---
Chrysene	µg/L	0.1	0.0001	< 0.1	---



FINAL REPORT

CA14539-SEP24 R1

Client: WSP Canada Inc.
Project: C A-GLD-23592540
Project Manager: Christy Groves
Samplers: NA

MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQQ_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
PAHs (continued)					
Dibenzo(a,h)anthracene	µg/L	0.1	0.002	< 0.1	---
Fluoranthene	µg/L	0.1	0.0008	< 0.1	---
Fluorene	µg/L	0.1	0.2	< 0.1	---
Indeno(1,2,3-cd)pyrene	µg/L	0.2		< 0.2	---
1-Methylnaphthalene	µg/L	0.5	2	< 0.5	---
2-Methylnaphthalene	µg/L	0.5	2	< 0.5	---
Methylnaphthalene, 2-(1-)	µg/L	0.5		< 0.5	---
Naphthalene	µg/L	0.5	7	< 0.5	---
Phenanthrene	µg/L	0.1	0.03	< 0.1	---
Pyrene	µg/L	0.1		< 0.1	---
PHCs					
F1 (C6-C10)	µg/L	25		< 25	< 25
F1-BTEX (C6-C10)	µg/L	25		< 25	< 25
F2 (C10-C16)	µg/L	100		< 100	---
F3 (C16-C34)	µg/L	200		< 200	---
F4 (C34-C50)	µg/L	200		< 200	---
Chromatogram returned to baseline at nC50	Yes / No	no		YES	---



FINAL REPORT

CA14539-SEP24 R1

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MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
SVOC Surrogates					
Surr 2-Methylnaphthalene-D10	Surr Rec %	no		60	---
Surr Fluoranthene-D10	Surr Rec %	no		93	---
Surr 2-Fluorobiphenyl	Surr Rec %	no		61	---
Surr 4-Terphenyl-d14	Surr Rec %	no		110	---
THMs (VOC)					
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5
VOC Surrogates					
Surr 1,2-Dichloroethane-d4	Surr Rec %	no		101	97
Surr 2-Bromo-1-Chloropropane	Surr Rec %	no		93	95
Surr 4-Bromofluorobenzene	Surr Rec %	no		97	91
VOCs					
Acetone	µg/L	30		< 30	< 30
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2
Chlorobenzene	µg/L	0.5	15	< 0.5	< 0.5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5
Dichlorodifluoromethane	µg/L	2.0		< 2	< 2



FINAL REPORT

CA14539-SEP24 R1

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MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
1,1-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5
1,3-dichloropropene (total)	µg/L	0.5		< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2
n-Hexane	µg/L	1.0		< 1	< 1
Methyl ethyl ketone	µg/L	20	400	< 20	< 20
Methyl Isobutyl Ketone	µg/L	20		< 20	< 20
Methyl-t-butyl Ether	µg/L	2.0	200	< 2	< 2
Methylene Chloride	µg/L	0.5	100	< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5
Tetrachloroethylene (perchloroethylene)	µg/L	0.5	50	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5



FINAL REPORT

CA14539-SEP24 R1

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Project Manager: Christi Groves
Samplers: NA

MATRIX: WATER

Sample Number	9	10
Sample Name	Field Blank	Trip Blank
Sample Matrix	Surface Water	Surface Water
Sample Date	13/09/2024	13/09/2024

L1 = PWQO_L / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
Vinyl Chloride	µg/L	0.2	600	< 0.2	< 0.2
Chloroform	µg/L	0.5		< 0.5	< 0.5



EXCEEDANCE SUMMARY

				PWQO_L / WATER
				/ - - Table 2 -
				General - July 1999
				PIBS 3303E
Parameter	Method	Units	Result	L1

Field Blank

Anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Benz(a)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.0004
Benzo(g,h,i)perylene	EPA 3510C/8270D	µg/L	< 0.2	0.00002
Benzo(k)fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0002
Chrysene	EPA 3510C/8270D	µg/L	< 0.1	0.0001
Dibenz(a,h)anthracene	EPA 3510C/8270D	µg/L	< 0.1	0.002
Fluoranthene	EPA 3510C/8270D	µg/L	< 0.1	0.0008
Phenanthrene	EPA 3510C/8270D	µg/L	< 0.1	0.03



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0333-SEP24	mg/L as CaCO3	2	< 2	1	20	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0172-SEP24	as N mg/L	0.1	<0.1	ND	10	100	90	110	101	75	125



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Anions by IC
Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	99	90	110	102	75	125
Sulphate	DIO0332-SEP24	mg/L	0.2	<0.2	ND	20	90	90	110	91	75	125

Conductivity
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0353-SEP24	uS/cm	2	< 2	0	20	98	90	110	NA		

Mercury by CVAAS
Method: EPA 7471A/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (dissolved)	EHG0028-SEP24	mg/L	0.01	< 0.00001	ND	20	118	80	120	130	70	130



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Metals in aqueous samples - ICP-MS
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Silver (total)	EMS0165-SEP24	mg/L	0.05	<0.00005	ND	20	96	90	110	74	70	130
Aluminum (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	108	70	130
Arsenic (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	99	90	110	114	70	130
Barium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	12	20	99	90	110	104	70	130
Beryllium (total)	EMS0165-SEP24	mg/L	0.007	<0.000007	ND	20	96	90	110	98	70	130
Boron (total)	EMS0165-SEP24	mg/L	2	<0.002	1	20	98	90	110	93	70	130
Calcium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	102	90	110	100	70	130
Cadmium (total)	EMS0165-SEP24	mg/L	0.003	<0.000003	11	20	102	90	110	102	70	130
Cobalt (total)	EMS0165-SEP24	mg/L	0.004	<0.000004	4	20	98	90	110	100	70	130
Chromium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	10	20	103	90	110	100	70	130
Copper (total)	EMS0165-SEP24	mg/L	1	<0.001	1	20	100	90	110	100	70	130
Iron (total)	EMS0165-SEP24	mg/L	7	<0.007	0	20	102	90	110	100	70	130
Potassium (total)	EMS0165-SEP24	mg/L	9	<0.009	4	20	106	90	110	109	70	130
Lithium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	13	20	97	90	110	105	70	130
Magnesium (total)	EMS0165-SEP24	mg/L	1	<0.001	7	20	107	90	110	129	70	130
Manganese (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	6	20	100	90	110	103	70	130
Molybdenum (total)	EMS0165-SEP24	mg/L	0.4	<0.0004	17	20	103	90	110	110	70	130
Sodium (total)	EMS0165-SEP24	mg/L	10	<0.01	7	20	100	90	110	99	70	130
Nickel (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	7	20	103	90	110	106	70	130
Lead (total)	EMS0165-SEP24	mg/L	0.09	<0.00009	10	20	96	90	110	93	70	130



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0165-SEP24	mg/L	3	<0.003	0	20	101	90	110	NV	70	130
Antimony (total)	EMS0165-SEP24	mg/L	0.9	<0.0009	ND	20	101	90	110	108	70	130
Selenium (total)	EMS0165-SEP24	mg/L	0.04	<0.00004	3	20	100	90	110	114	70	130
Silicon (total)	EMS0165-SEP24	mg/L	20	<0.02	5	20	99	90	110	NV	70	130
Tin (total)	EMS0165-SEP24	mg/L	0.06	<0.00006	4	20	102	90	110	NV	70	130
Strontium (total)	EMS0165-SEP24	mg/L	0.08	<0.00008	5	20	101	90	110	98	70	130
Tellurium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	ND	20	101	90	110	NV	70	130
Titanium (total)	EMS0165-SEP24	mg/L	0.1	<0.0001	3	20	101	90	110	NV	70	130
Thallium (total)	EMS0165-SEP24	mg/L	0.005	<0.000005	ND	20	99	90	110	94	70	130
Uranium (total)	EMS0165-SEP24	mg/L	0.002	<0.000002	9	20	100	90	110	97	70	130
Vanadium (total)	EMS0165-SEP24	mg/L	0.01	<0.00001	7	20	100	90	110	109	70	130
Tungsten (total)	EMS0165-SEP24	mg/L	0.2	<0.0002	ND	20	100	90	110	NV	70	130
Zinc (total)	EMS0165-SEP24	mg/L	2	<0.002	4	20	99	90	110	106	70	130
Zirconium (total)	EMS0165-SEP24	mg/L	2	<0.002	ND	20	103	90	110	NV	70	130
Aluminum (0.2µm)	EMS0213-SEP24	mg/L	1	<0.001	8	20	96	90	110	100	70	130



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Petroleum Hydrocarbons (F1)

Method: CCME Tier 1 | Internal ref.: ME-CA-IENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F1 (C6-C10)	GCM0232-SEP24	µg/L	25	<25	ND	30	96	60	140	107	60	140
F1 (C6-C10)	GCM0299-SEP24	µg/L	25	<25	ND	30	86	60	140	100	60	140

Petroleum Hydrocarbons (F2-F4)

Method: CCME Tier 1 | Internal ref.: ME-CA-IENVIGC-LAK-AN-010

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
F2 (C10-C16)	GCM0214-SEP24	µg/L	100	<100	ND	30	73	60	140	86	60	140
F3 (C16-C34)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140
F4 (C34-C50)	GCM0214-SEP24	µg/L	200	<200	ND	30	73	60	140	86	60	140



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

pH
Method: SM 4500 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0333-SEP24	No unit	0.05	NA	0		100			NA		



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Semi-Volatile Organics

Method: EPA 3510C/8270D | Internal ref.: ME-CA-IENVIGC-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1-Methylnaphthalene	GCM0259-SEP24	ug/L	0.5	< 0.5	ND	30	94	50	140	84	50	140
2-Methylnaphthalene	GCM0259-SEP24	µg/L	0.5	< 0.5	ND	30	96	50	140	85	50	140
Acenaphthene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	87	50	140
Acenaphthylene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	89	50	140	84	50	140
Anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	90	50	140
Benzo(a)anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	92	50	140	90	50	140
Benzo(a)pyrene	GCM0259-SEP24	ug/L	0.01	< 0.01	ND	30	90	50	140	87	50	140
Benzo(b+j)fluoranthene	GCM0259-SEP24	ug/L	0.1	< 0.1	ND	30	92	50	140	88	50	140
Benzo(ghi)perylene	GCM0259-SEP24	µg/L	0.2	< 0.2	ND	30	93	50	140	89	50	140
Benzo(k)fluoranthene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	94	50	140	90	50	140
Chrysene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	94	50	140	90	50	140
Dibenzo(a,h)anthracene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	90	50	140	88	50	140
Fluoranthene	GCM0259-SEP24	ug/L	0.1	< 0.1	ND	30	94	50	140	93	50	140
Fluorene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	95	50	140	92	50	140
Indeno(1,2,3-cd)pyrene	GCM0259-SEP24	µg/L	0.2	< 0.2	ND	30	89	50	140	88	50	140
Naphthalene	GCM0259-SEP24	µg/L	0.5	< 0.5	ND	30	89	50	140	80	50	140
Phenanthrene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	90	50	140
Pyrene	GCM0259-SEP24	µg/L	0.1	< 0.1	ND	30	93	50	140	89	50	140



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Toluene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	94	60	130	92	50	140
1,1,1,2-Tetrachloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	92	50	140
1,1,1-Trichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	92	60	130	91	50	140
1,1,2,2-Tetrachloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	89	60	130	90	50	140
1,1,2-Trichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	91	50	140
1,1-Dichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	96	50	140
1,1-Dichloroethylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	92	50	140
1,2-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	92	50	140
1,2-Dichloroethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	91	50	140
1,2-Dichloropropane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	89	50	140
1,3-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	89	50	140
1,4-Dichlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Acetone	GCM0276-SEP24	ug/L	30	<30	ND	30	106	50	140	86	50	140
Benzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	97	60	130	95	50	140
Bromodichloromethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	92	60	130	86	50	140
Bromoform	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	89	50	140
Bromomethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	87	50	140	83	50	140
Carbon tetrachloride	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	92	60	130	93	50	140
Chlorobenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Chloroform	GCM0276-SEP24	ug/L	0.5	<0.5	ND	30	95	60	130	94	50	140



FINAL REPORT

CA14539-SEP24 R1

QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,2-Dichloroethene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	94	50	140
cis-1,3-Dichloropropene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	90	60	130	88	50	140
Dibromochloromethane	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	89	50	140
Dichlorodifluoromethane	GCM0276-SEP24	µg/L	2.0	<2	ND	30	73	50	140	74	50	140
Ethylbenzene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	92	50	140
Ethylenedibromide	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	93	60	130	90	50	140
n-Hexane	GCM0276-SEP24	µg/L	1.0	<1	ND	30	85	60	130	96	50	140
m/p-xylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	96	60	130	92	50	140
Methyl ethyl ketone	GCM0276-SEP24	ug/L	20	<20	ND	30	105	60	130	87	50	140
Methyl Isobutyl Ketone	GCM0276-SEP24	µg/L	20	<20	ND	30	100	50	140	86	50	140
Methyl-t-butyl Ether	GCM0276-SEP24	µg/L	2.0	<2	ND	30	92	60	130	84	50	140
Methylene Chloride	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	95	60	130	91	50	140
o-xylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	94	60	130	89	50	140
Styrene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	98	60	130	93	50	140
Tetrachloroethylene (perchloroethylene)	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	90	50	140
trans-1,2-Dichloroethene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	93	50	140
trans-1,3-Dichloropropene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	93	60	130	92	50	140
Trichloroethylene	GCM0276-SEP24	µg/L	0.5	<0.5	ND	30	100	60	130	89	50	140
Trichlorofluoromethane	GCM0276-SEP24	µg/L	5.0	<5	ND	30	96	50	140	99	50	140
Vinyl Chloride	GCM0276-SEP24	µg/L	0.2	<0.2	ND	30	93	50	140	89	50	140



QC SUMMARY

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

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

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

Multielement Scan Qualifier: as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

Duplicate Qualifier: for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Matrix Spike Qualifier: for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

LEGEND

FOOTNOTES

NSS Insufficient sample for analysis.

RL Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

NA The sample was not analysed for this analyte

ND Non Detect

Results relate only to the sample tested.

Data reported represent the sample as submitted to SGS. Solid samples expressed on a dry weight basis.

"Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the "Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act and Excess Soil Quality" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated.

SGS Canada Inc. statement of conformity decision rule does not consider uncertainty when analytical results are compared to a specified standard or regulation.

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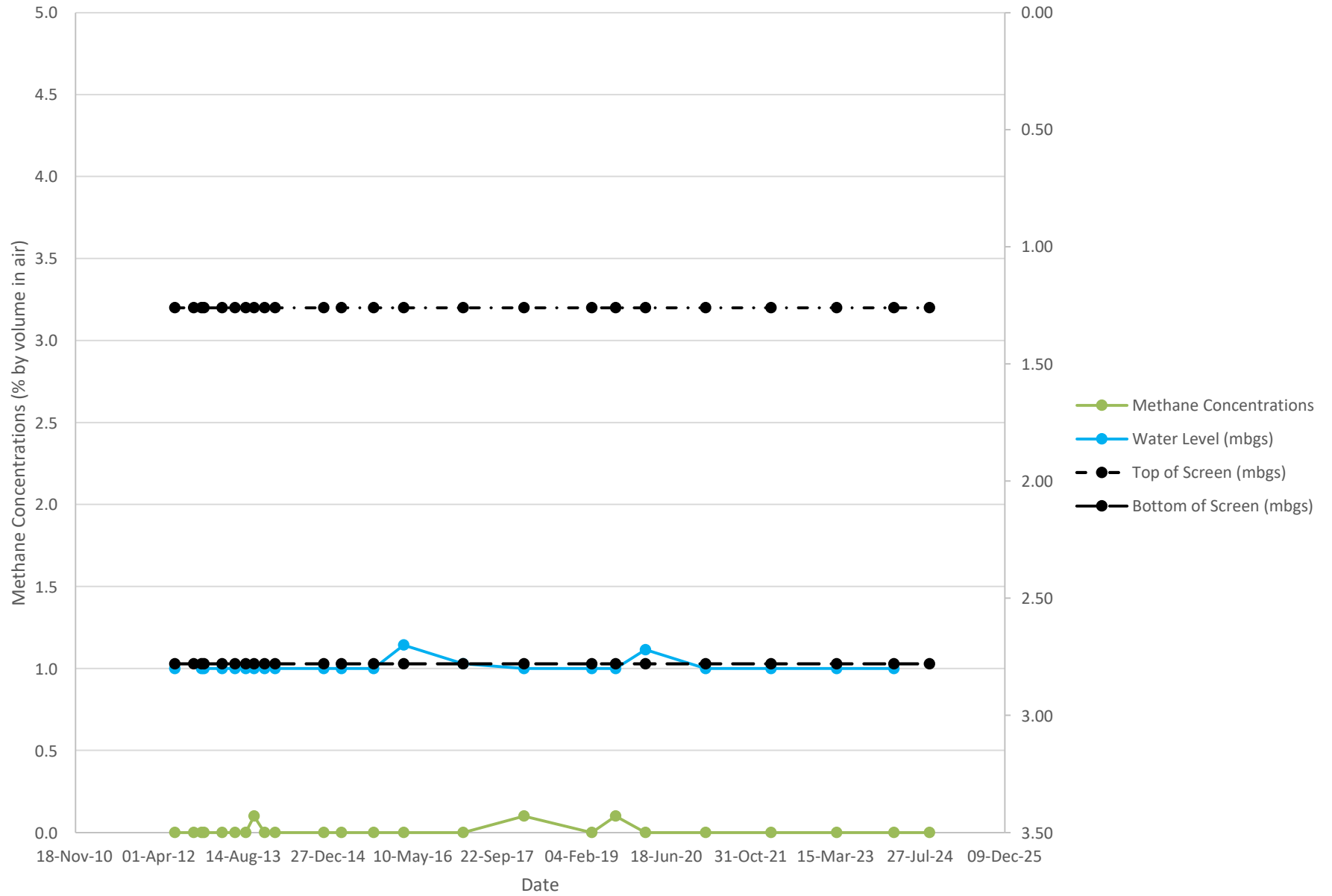
This report supersedes all previous versions.

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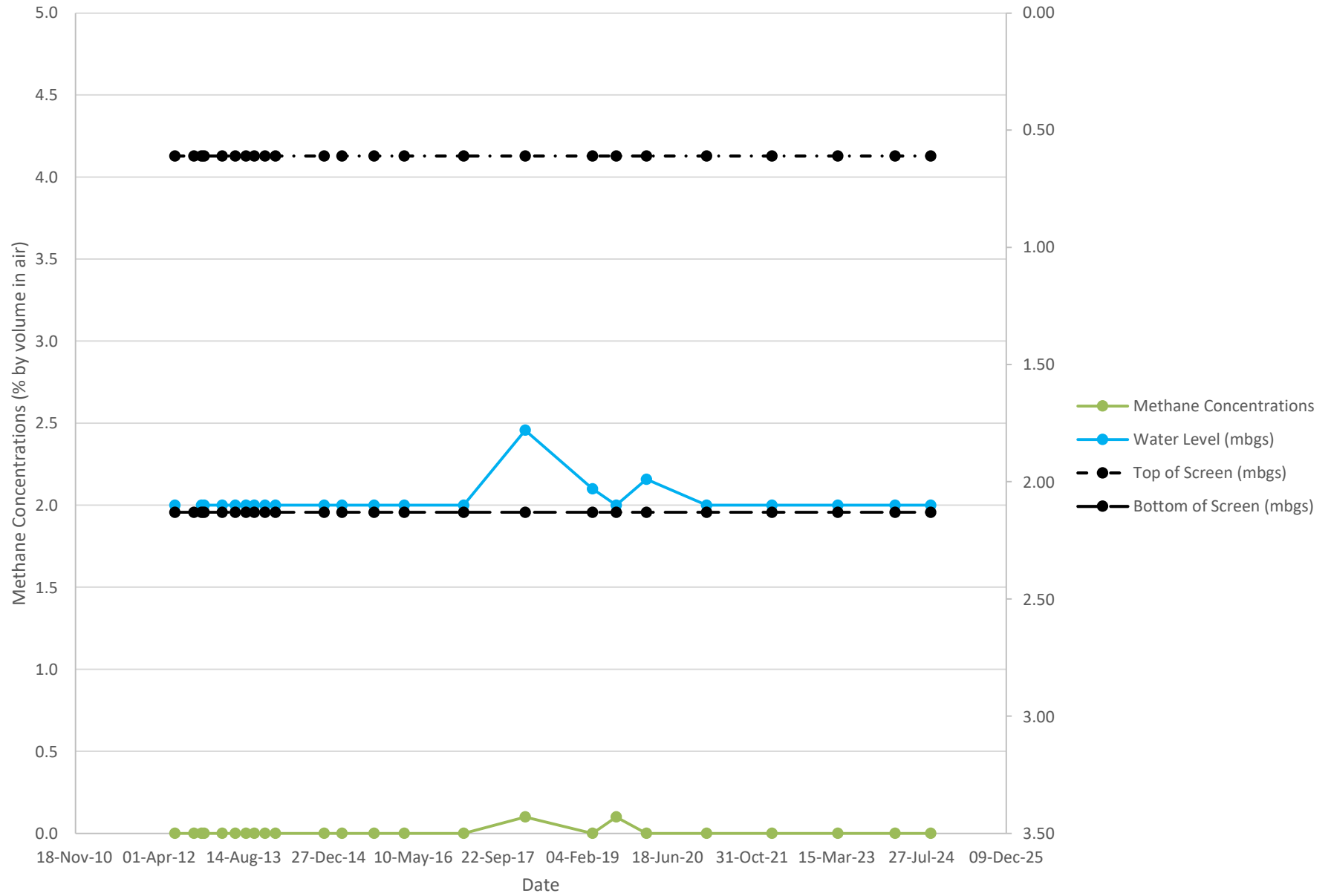
APPENDIX D

Historical Methane and Water Level Graphs

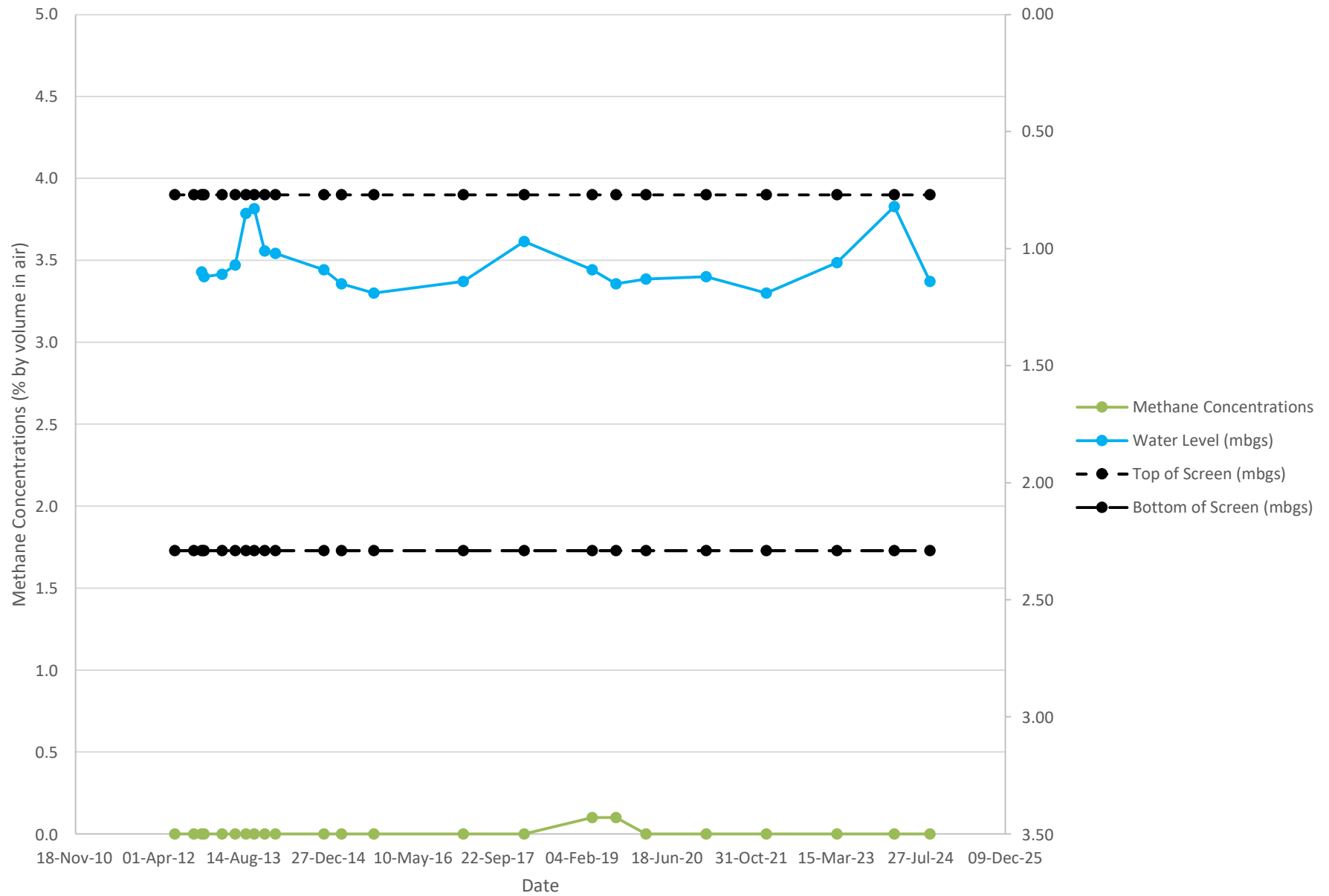
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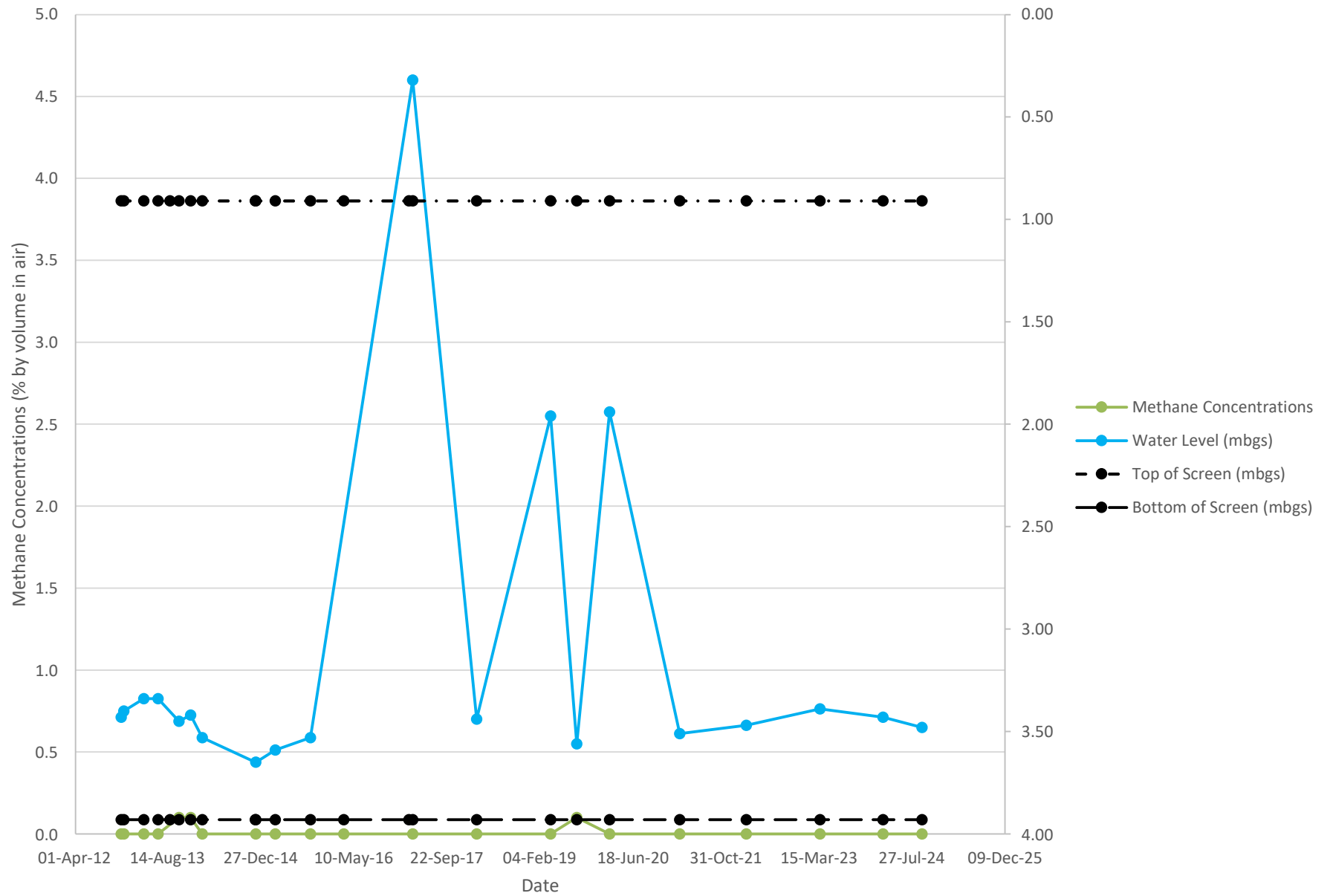
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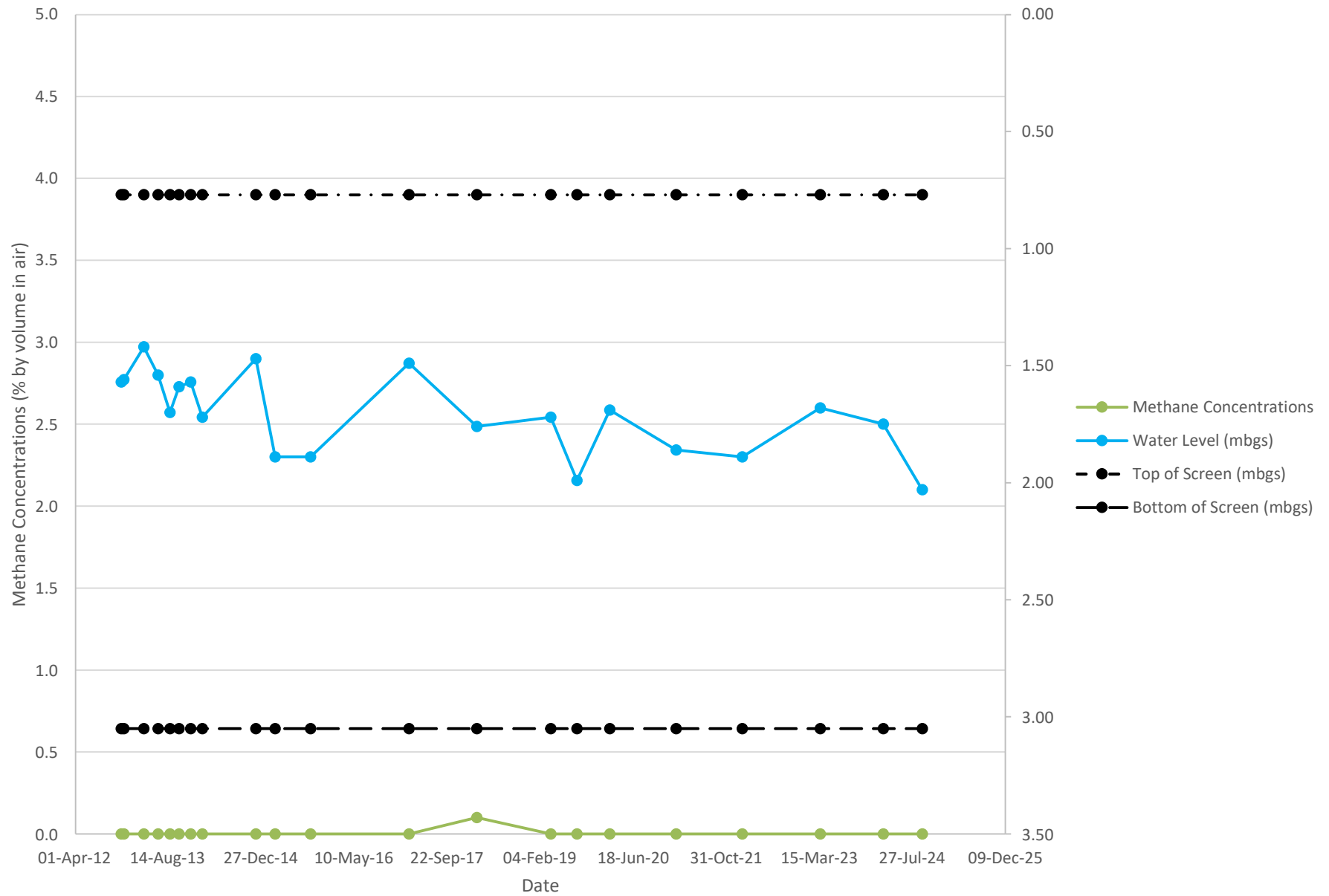
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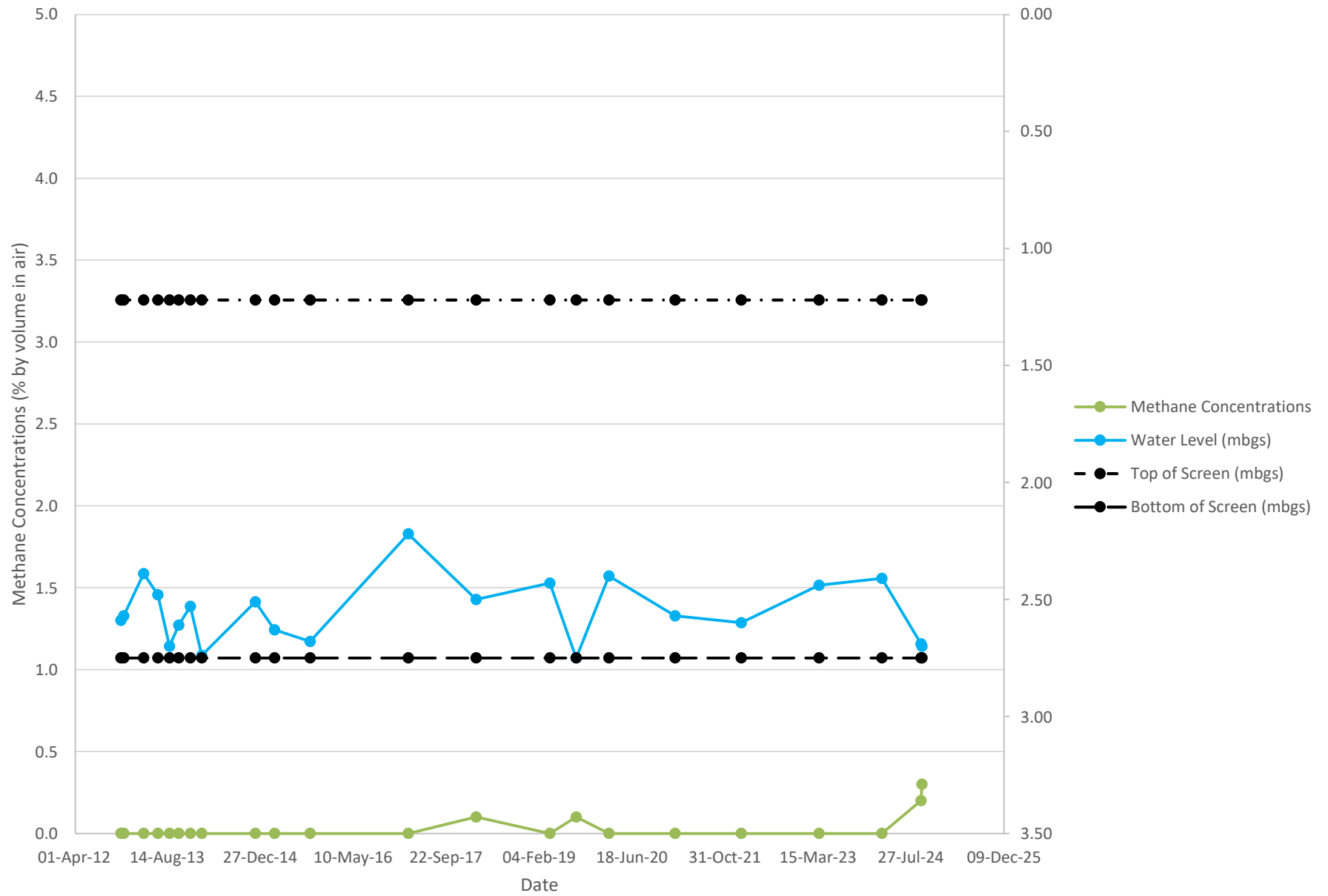
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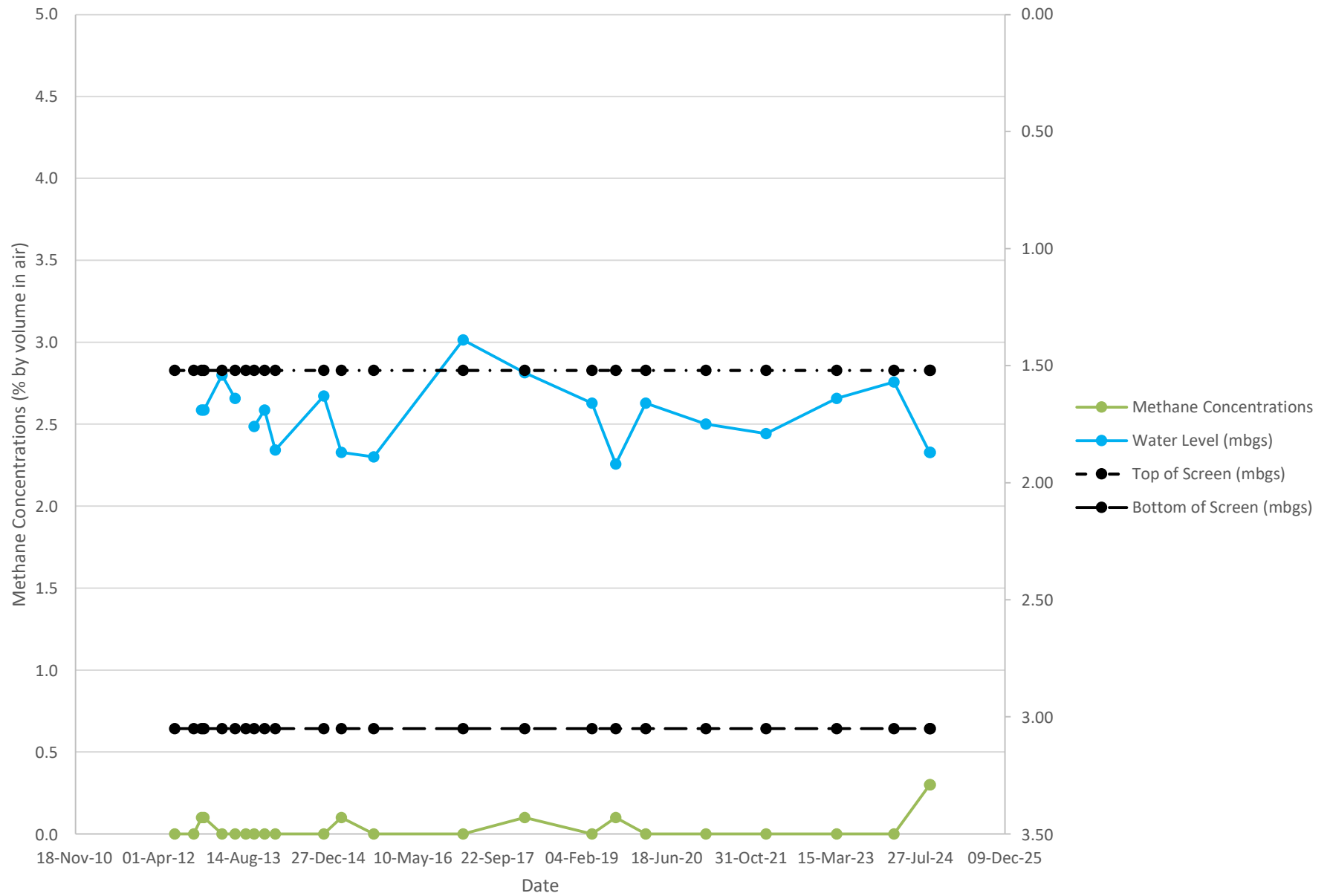
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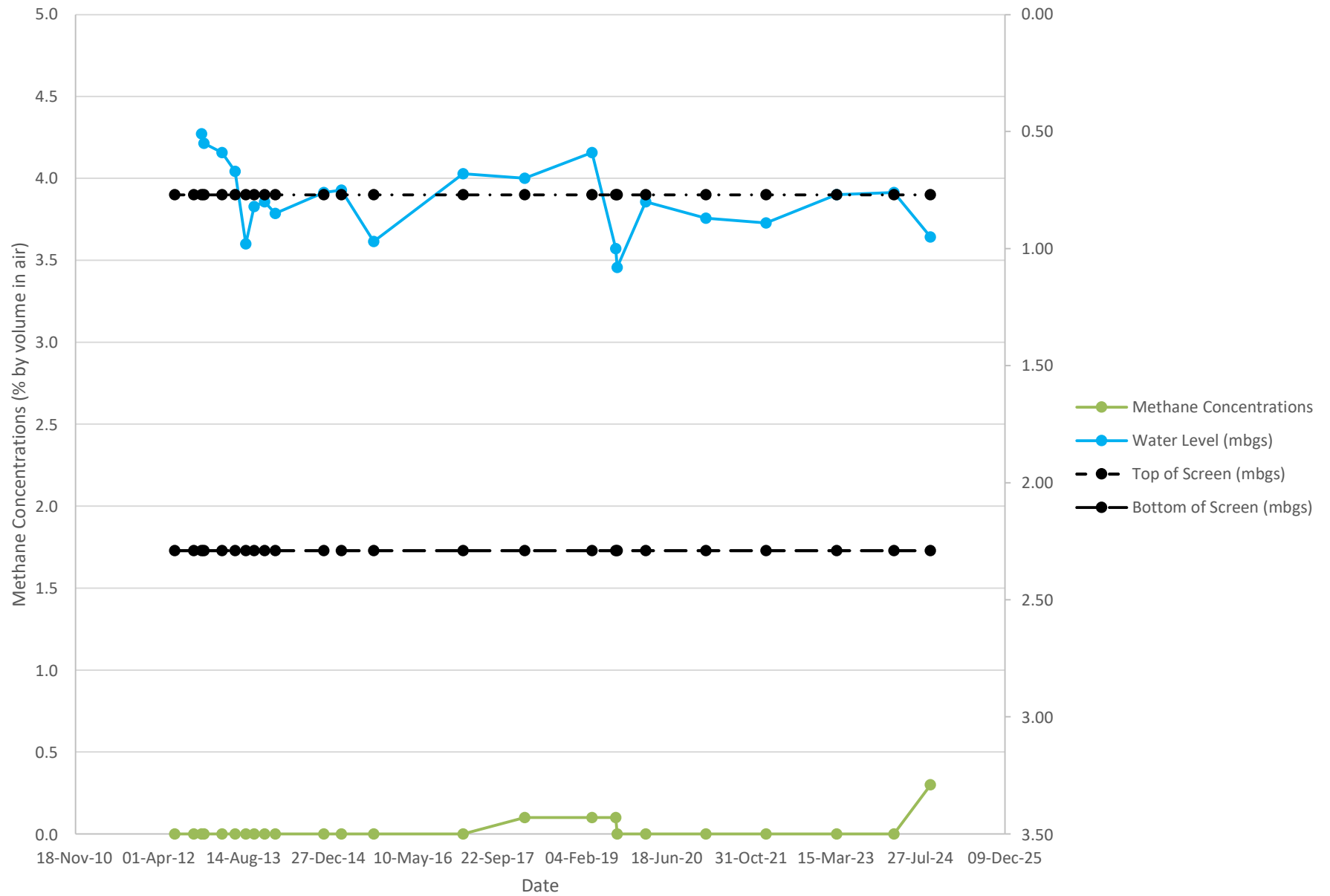
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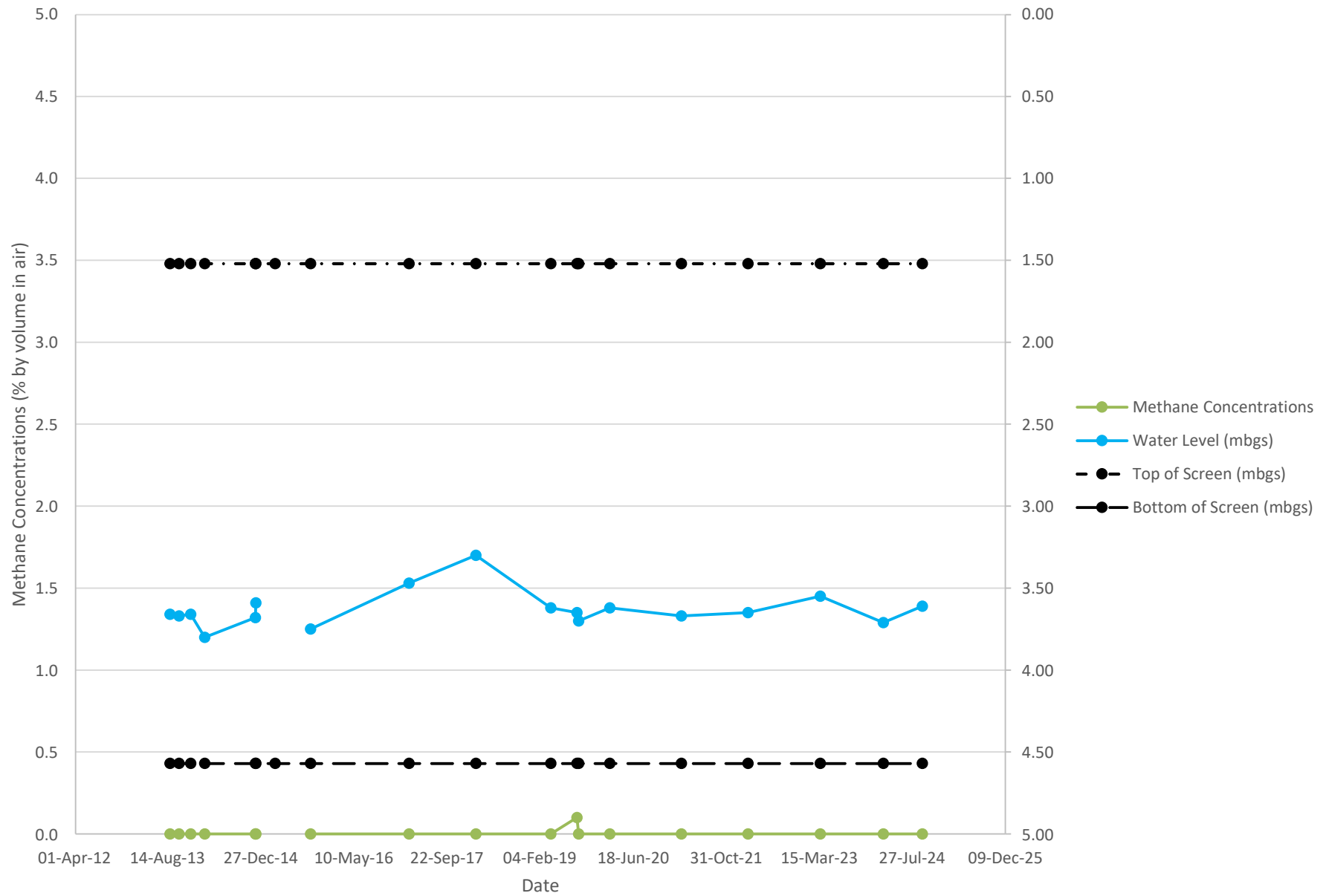
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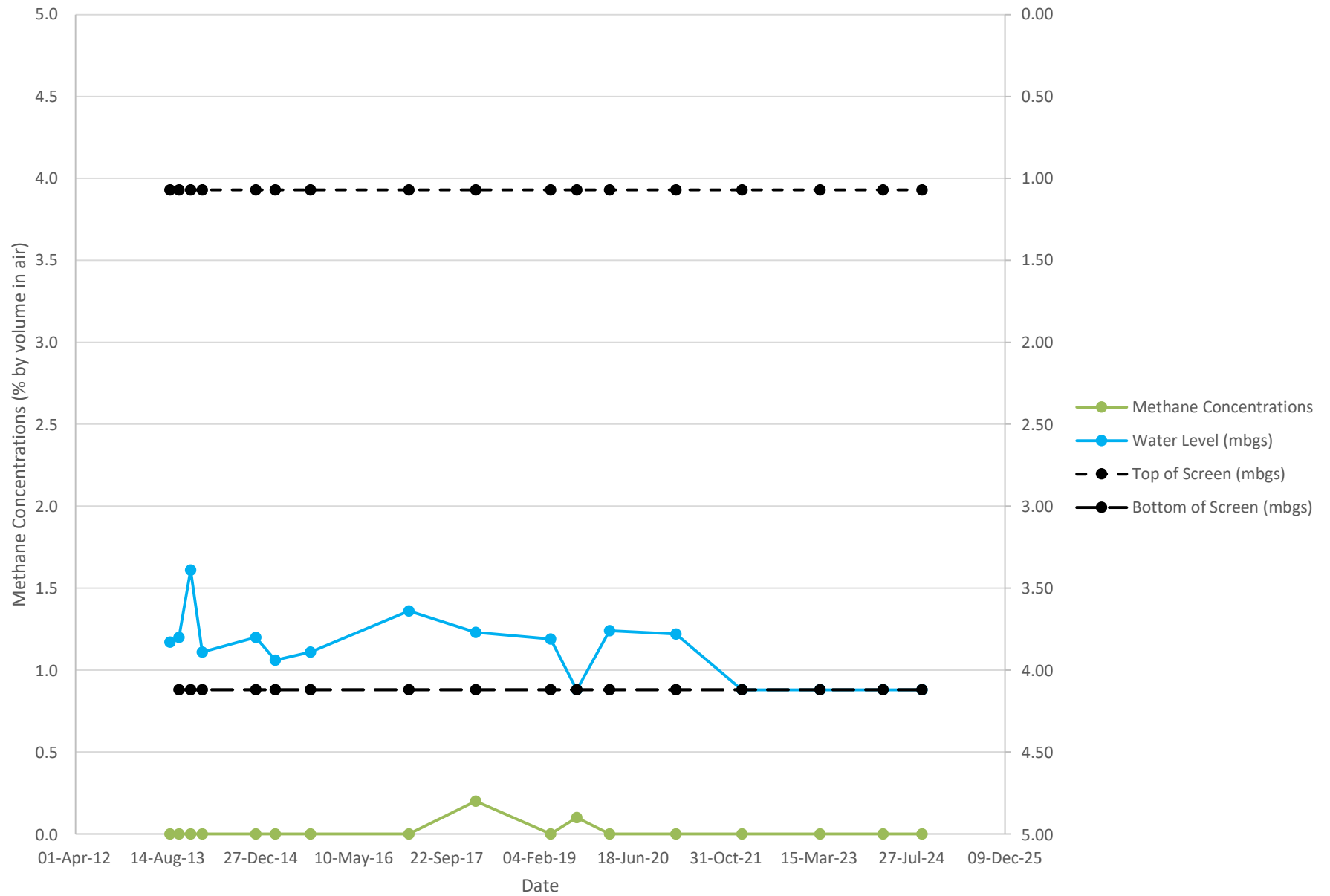
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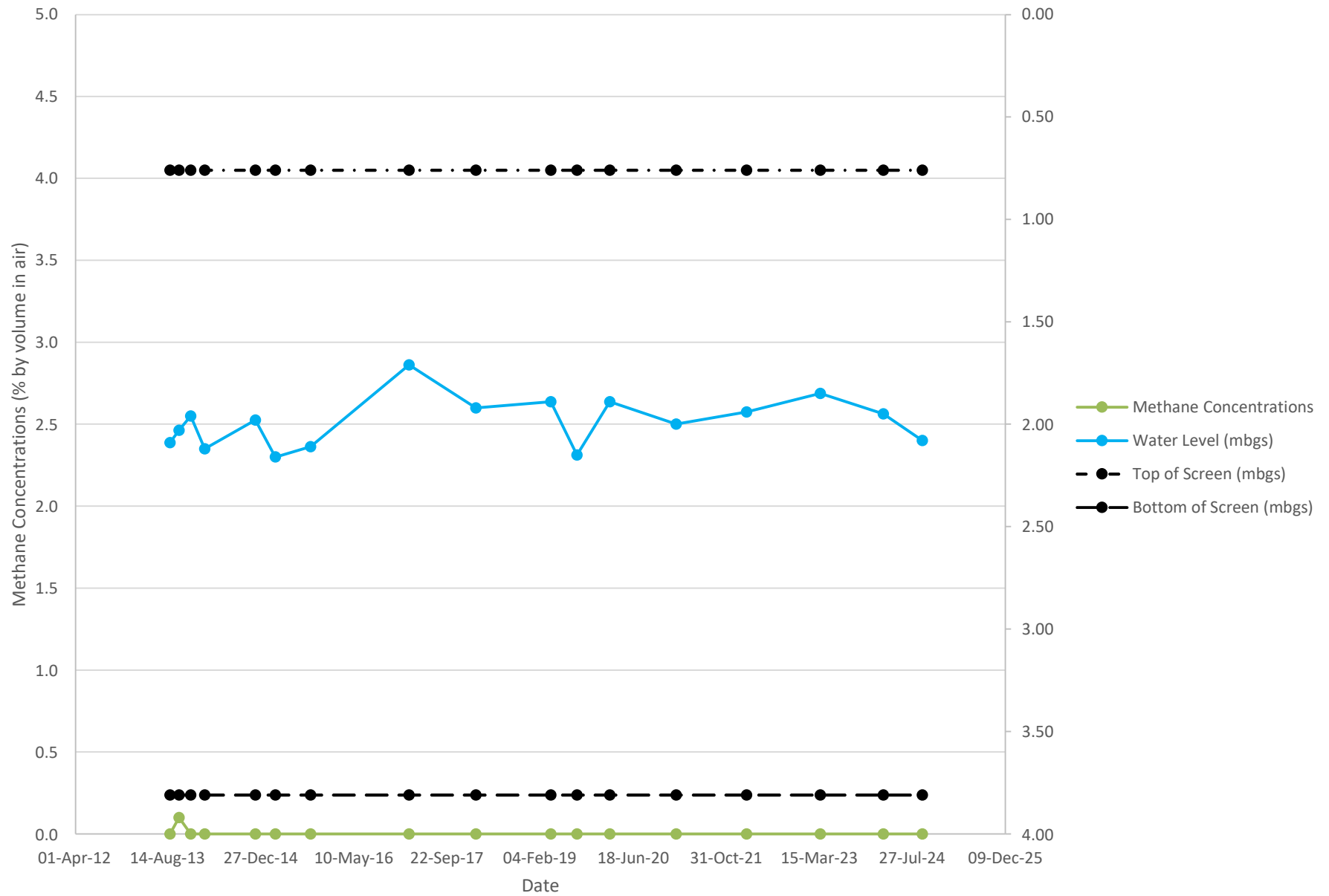
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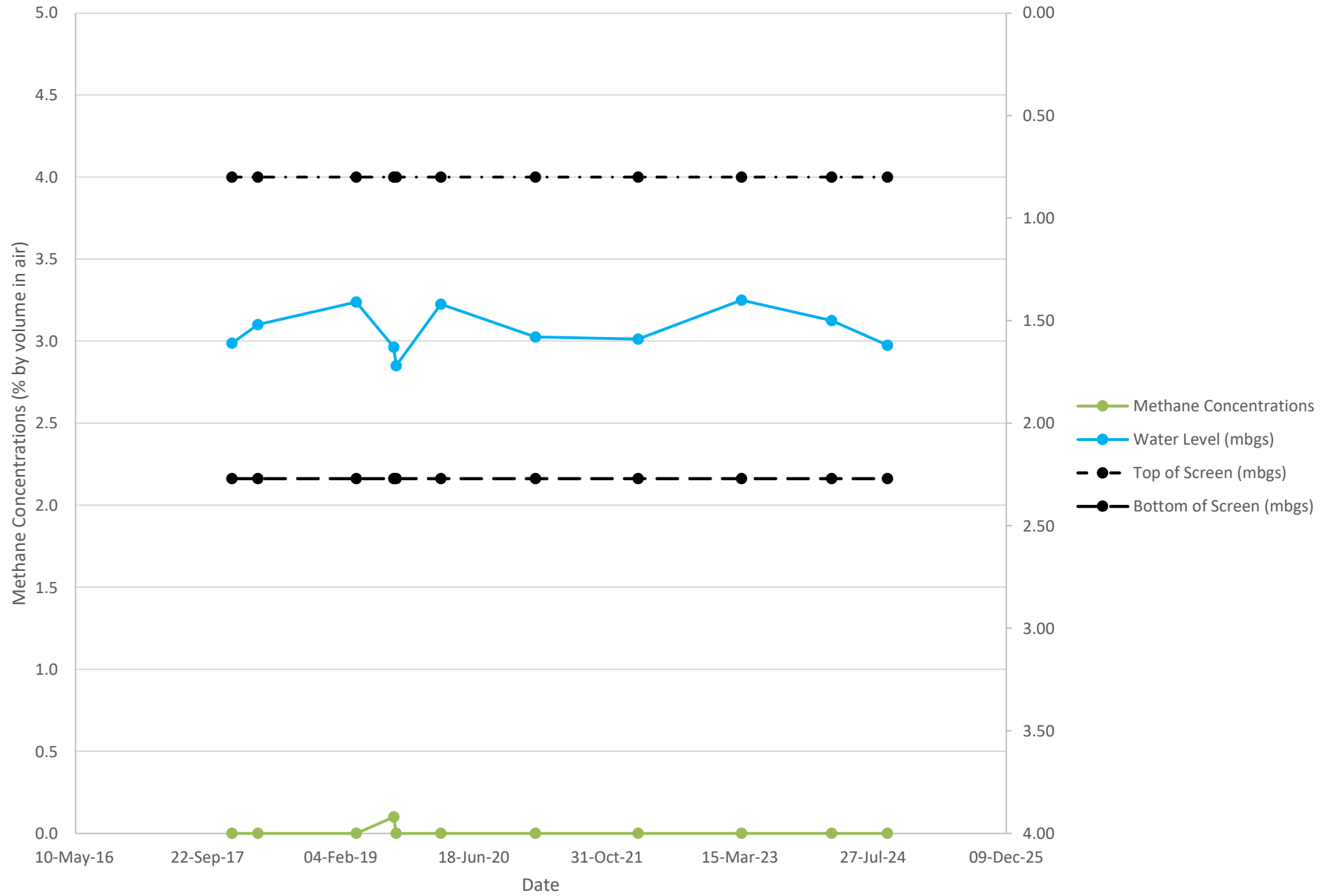
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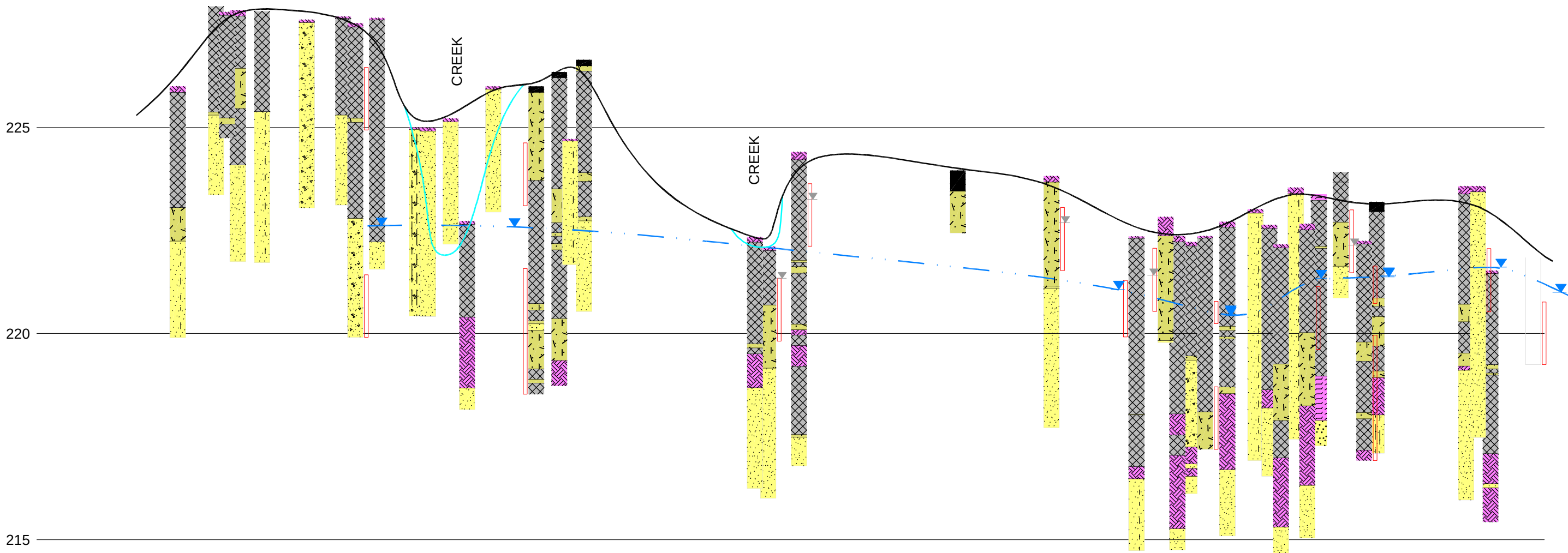
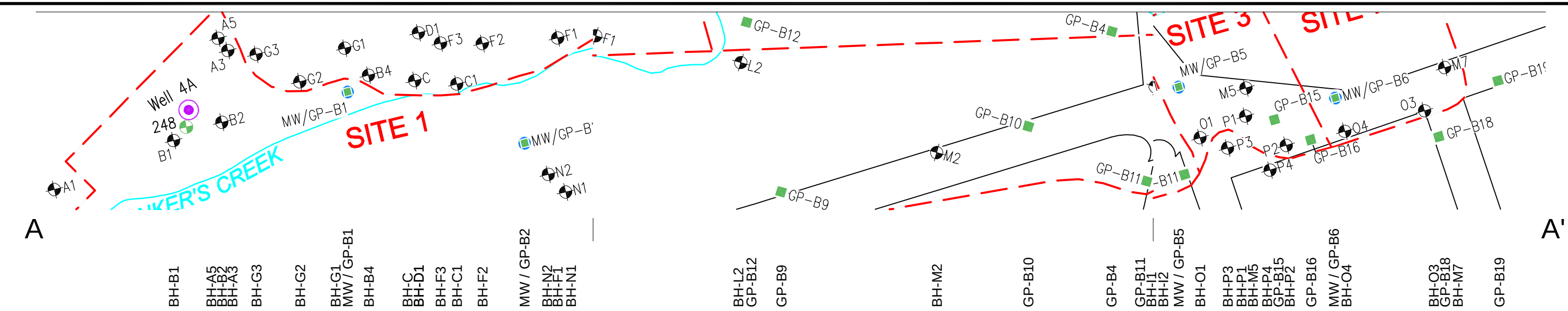
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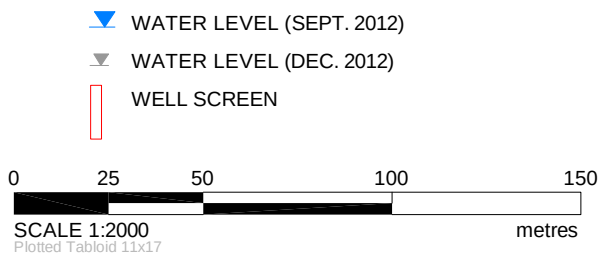
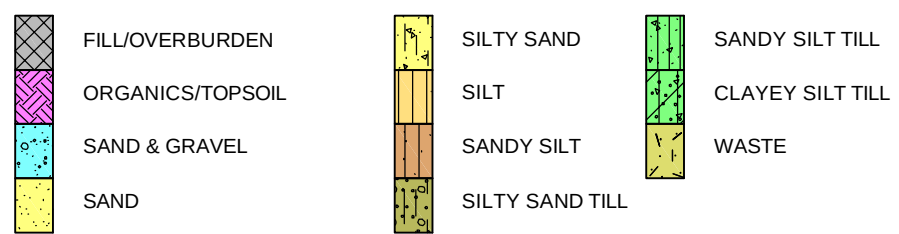
APPENDIX E

Site Section (Site 1)

PLOT DATE: April 12, 2013
FILENAME: T:\Projects\2011\11-1170-0043 (Barrie, Historic Landfills)\-FA-\111700043FASCT.dwg



STRATIGRAPHIC LEGEND:



Refer to Figure 2 for Legend and Notes

 Barrie, Ontario, Canada		SCALE	AS SHOWN	TITLE SITE SECTION A-A'	
		DATE	16 JAN 2013		
		DESIGN			
		CAD	S BOWERMAN		
FILE No. 1111700043FASCT.dwg		CHECK		HISTORIC WASTE DISPOSAL SITES CITY OF BARRIE	
PROJECT No. 11-1170-0043		REV.			
		REVIEW		FIGURE 9	

APPENDIX F

Well Decommissioning Logs

General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublot Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the “Comments” area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check “Other (specify)” and record the type of equipment, check each equipment that applies.

Well Use

If the well’s use is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well’s status is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing “Depth From” as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing “Depth From” as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A “well screen” means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is “Untested,” “Fresh” (i.e., not salty), or “Other (specify).” If “Other (specify)” is recorded, use the “Other (specify)” dropdown list to select the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off “Gas” if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off “Pumping Discontinued” if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off “Pumping Discontinued” on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off “Flowing Well” (i.e., static water level above the ground surface).

In the “Results of Well Yield Testing” section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the “Map of Well Location” section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on “Add Map (+)” to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: “I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate”.

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from “**incomplete**” to an assigned audit number. The signature field will then be available. Click on “signature” to enter the well technician’s electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: <https://helpx.adobe.com/acrobat/using/digital-ids.html>

Notice of Collection of Personal Information

Personal information contained on this form is collected pursuant to sections 35-50 and 75(2) of the *Ontario Water Resources Act* and section 16.3 of the Wells Regulation. This information will be used for the purpose of maintaining a public record of wells in Ontario. This form and the information contained on the form will be stored in the Ministry's well record database and made publicly available. Questions about this collection should be directed to the Water Well Customer Service Representative at the Wells Help Desk, 125 Resources Road, Toronto Ontario M9P 3V6, at 1-888-396-9355 or wellshelpdesk@ontario.ca.

Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

[No Tag on Well](#)

Type *

☐ Construction ☒ Abandonment

Measurement recorded in: *

☐ Metric ☒ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name Attn: Stephanie Huyssen	First Name
Organization City of Barrie	Email Address

Current Address

Unit Number	Street Number * 70	Street Name * Collier Street	City/Town/Village Barrie
Country Canada	Province Ontario	Postal Code L4M 4T6	Telephone Number 705-726-4242

2. Well Location

Address of Well Location

Unit Number	Street Number * n/a	Street Name * Boys Street South X Perry Street	Township Vespra
Lot 24	Concession 5	County/District/Municipality Simcoe	
City/Town Barrie	Province Ontario	Postal Code	
UTM Coordinates NAD 83	Zone * 17	Easting * 603395	Northing * 4915145
			Municipal Plan and Sublot Number Test UTM in Map

Other
[Job No. 58549](#)

3. Abandonment and Sealing

Well Depth [25](#) (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information
[5ft screen](#)

Original Owner

General Description	Depth From (ft)	Depth To (ft)
Removed all pipe	0	25
Overdrilled	0	6
Backfilled with Bentonite	0	25

4. Annular Space			
Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0			

5. Method of Construction					
☐ Cable Tool	☐ Rotary (Conventional)	☐ Rotary (Reverse)	☐ Boring	☐ Air percussion	☐ Diamond
☐ Jetting	☐ Driving	☐ Digging	☐ Rotary (Air)	☐ Augering	☐ Direct Push
☐ Other (specify) _____					

6. Well Use		
☐ Public	☐ Industrial	☐ Cooling & Air Conditioning
☐ Domestic	☐ Commercial	☐ Not Used
☐ Livestock	☐ Municipal	☒ Monitoring
☐ Irrigation	☐ Test Hole	☐ Dewatering
☐ Other (specify) _____		

7. Status of Well		
☐ Water Supply	☐ Replacement Well	☐ Test Hole
☐ Recharge Well	☐ Dewatering Well	☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)	☐ Abandoned, Insufficient Supply	☐ Abandoned, Poor Water Quality
☒ Abandoned, other (specify) <u>Not In Use</u>		
☐ Other (specify) _____		

8. Construction Record - Casing (use negative number(s) to indicate depth above ground surface)				
Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth (ft) ☐ Gas Kind of water ☐ Fresh ☐ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0		

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

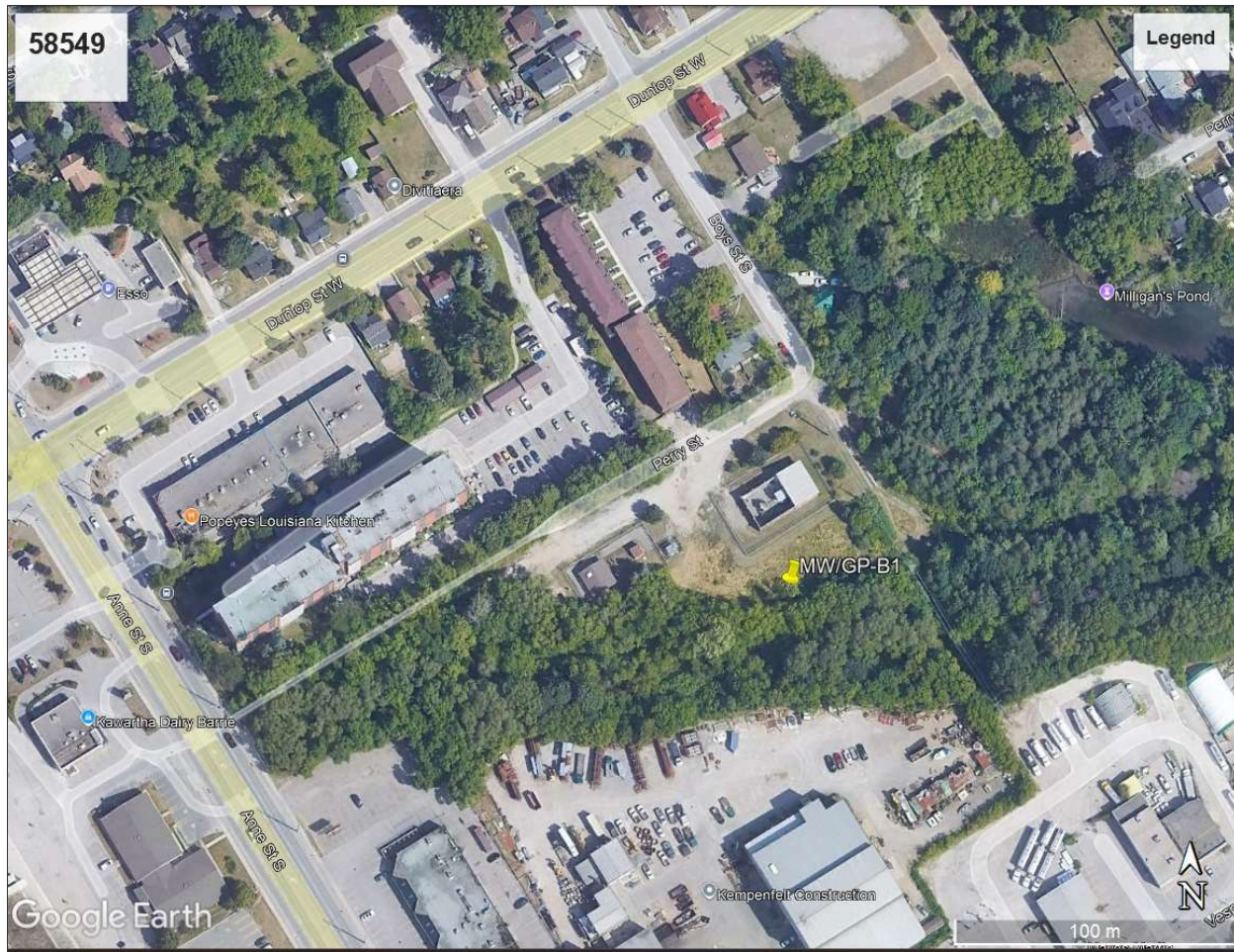
☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? ☐ Yes ☒ No
-------------------------	--------------------	-------------------------------	---------------------------------------	--

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)
-----------------------------	-----------------------------	-----------------------

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☐ Make map area bigger



14. Information

Well owner's information package delivered

☐ Yes ☒ No

Date Package Delivered (yyyy/mm/dd)

Date Work Completed (yyyy/mm/dd) *

2024/11/28

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *

ALTECH Drilling & Investigative Services Ltd.

Well Contractor's License Number *

7282

Business Address

Unit Number

Street Number

1212

Street Name *

Bishop Street North

City/Town/Village *

Cambridge

Province

Ontario

Postal Code *

N3H 2K9

Business Telephone Number

519-650-5557

Business Email Address

Last Name of Well Technician *

Stranz

First Name of Well Technician *

Brandon

Well Technician's License Number *

4021

16. Declaration *

☒ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name Stranz	First Name Brandon	Email Address bstranz@altechworld.com
Signature Brandon Stranz	 Digitally signed by Brandon Stranz Date: 2024.12.16 11:51:17 -05'00'	Date Submitted (yyyy/mm/dd) 2024/12/16

17. Ministry Use Only

Audit Number
H3K4 XX5K

General Instructions and Explanations for completing a Well Record

A completed electronic Well Record Form must be delivered to the well purchaser and the owner of the land on which the well is situated within 14 days after the date on which the well's structural stage is complete. The electronic Well Record must also be forwarded within 30 days after the date on which the well's structural stage is complete to the ministry through email to the following email address: WellRecordSubmission@ontario.ca

False and Misleading Information

Subsection 98(2) of the *Ontario Water Resources Act*, R.S.O. 1990 c. O. 40, states that:

"No person shall orally, in writing or electronically, give or submit false or misleading information in any statement, document or data, to any provincial officer, the Minister, the Ministry or the Agency, any employee in or agent of the Ministry or the Agency, or any person involved in carrying out a program of the Ministry or the Agency in respect of any matter related to this Act or the regulations."

Further, subsection 98(3) of the Act states that:

"No person shall include false or misleading information in any document or data required to be created, stored or submitted under this Act."

Measurements

All measurements must be recorded in the specified unit, metric or imperial by checking off the applicable box on the top of the form. You must use the checked unit consistently throughout the well record. Measurements must be reported to 1/10th of a metre if the unit is a metre. All measurements of depth must be referenced to ground surface.

Well Owner's Information

A "well owner" means the owner of land upon which a well is situated and includes a tenant or lessee of the land and a well purchaser. If the "well owner" is an individual, record the owner's last name and first name or if the "well owner" is a business, government or other organization, record the name in the "organization" area.

Well Location

Street Number/Name and City/town/Village must be provided, if available.

Geographic Township, Concession and Lot must be reported if the well is located in an area where such information exists.

UTM Coordinates must be recorded each time a Well Record is completed. Click the button [Test UTM in Map] to use the UTM Coordinates to plot the location to Google map. This allows verification of the UTM Coordinates. This will also automatically populate the County/District.

Municipal Plan and Sublot Number may be provided, if available.

Overburden and Bedrock Materials

For each formation encountered during construction, choose words from the lists that best describe the formation on the basis of general colour, most common material, other materials, and general description of the formation.

General Colours are White, Yellow, Grey, Brown, Blue, Red, Green and Black.

Examples of Materials are: Fill, Silt, Top Soil, Coarse Sand, Slate, Muck, Gravel, Limestone, Dolomite, Quartzite, Peat, Stones, Fine Sand, Shale, Granite, Clay, Boulders, Medium Sand, Sandstone, and Greenstone.

Some definitions are as follows:

- Clay: Composed of very fine particles. Forms dense hard lumps or clods when dry and a very elastic putty-like mass when wet. It can be rolled between fingers to form a long, flexible ribbon.
- Silt: Grain size, midway between sand and clay. It may form clods which, when broken, feel soft and floury. When moist, it will form a cast that can be handled freely without breaking. Rolled between thumb and finger, it will not "ribbon" but will give a broken appearance.

- Sand: Grains are loose and granular and may be seen and felt readily. Squeezed in the hand when dry, it falls apart when the pressure is released. Squeezed when moist, it will form a cast that will crumble when touched. Should be listed as fine sand, medium sand or coarse sand.
- Gravel: Rock fragments greater than 0.3 cm in diameter.

Examples of General Descriptions are Loose, Cemented, Previously Dug or Bored, Porous, Layered, Previously Drilled, Dense, Soft, Wood Fragments, Packed, Hard.

Abandonment

To report abandonment of a well, check off the applicable box in Type on the top of the form. Details of abandonment must be recorded in the Abandonment and Sealing Section. Additional comments may be entered in the comments box under the Information section.

Annular Space

Record all material placed in the annular space around the single casing or around the permanent outer casing. If the well is a telescoped well [i.e., a well with an outer casing and inner casing(s)] or if the well is a multi-level nested test hole, report the depth from, depth to, material and volume placed for the annular space between two different sized casings or between the inner casing(s) and the side of the well in the “Comments” area of this electronic well record form.

Method of Construction

If the equipment used to construct the well is not on the list, check “Other (specify)” and record the type of equipment, check each equipment that applies.

Well Use

If the well’s use is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple uses, check each use that applies.

Status of Well

If the well’s status is not provided on the list, check “Other (specify)” and record the use of the well. If the well has multiple statuses, check each use that applies.

Construction Record – Casing and Open Hole

Use negative values to report the top of casing above ground surface. For example, if the top of the casing is 0.4 metres above the ground surface and the bottom of the casing 6.0 metres below the ground surface, record the casing “Depth From” as -0.4.

If the top of casing is located below the ground surface (e.g., if a test hole is constructed and the top of casing is located below the ground surface in a flush mounted well vault), report the top of the casing from below ground surface. For example, if the top of the casing is 0.1 metres below the ground surface and the bottom of the casing is 6 metres below the ground surface, record the casing “Depth From” as 0.1.

Note: If a drive shoe is used, the shoe is considered casing and it must be reported if the shoe has a different inside diameter thickness.

If a portion of the well was created an open hole, record the location of the open hole on a separate row, including the diameter and the depth (top and bottom of open hole) from the ground surface.

Construction Record – Well Screen

A “well screen” means perforated pipe or tubing, unsealed concrete tiles or other material installed in a well to filter out particulate matter and form the water intake zone. Therefore, the length of a well screen includes any slotted or perforated area and unsealed area of pipe or tiles.

Water Details

- if groundwater was located, record the depth from the ground surface to the location of the groundwater resource, and
- record if the groundwater quality is “Untested,” “Fresh” (i.e., not salty), or “Other (specify).” If “Other (specify)” is recorded, use the “Other (specify)” dropdown list to select the type of groundwater (e.g., salty, blackish water, yellowish water, mineralized, etc.).

Check off “Gas” if natural gas was encountered during well construction.

Note: Natural gas encounters need to be immediately reported to the ministry at 1-800-268-6060, well purchaser and the owner of the land.

Results of Well Yield Testing

Check off “Pumping Discontinued” if pumping was discontinued before 1 hour of continuous pumping. Explain the reason why pumping was discontinued or in some cases not performed (e.g., the well went dry, impossible to install pump in small diameter well, static water level from test hole or dewatering well was obtained and is reported instead of completing a yield test etc.).

Note: Equipment breakdown is not an acceptable reason for checking off “Pumping Discontinued” on the well record form. If groundwater in the well is flowing out of the well, provide the rate of flow, and check off “Flowing Well” (i.e., static water level above the ground surface).

In the “Results of Well Yield Testing” section of the well record form, record:

- the depth to the intake of the pump,
- the rate of pumping and duration of pumping period during the yield test,
- the final water level when pumping stops,
- water level measurements made during pumping (drawdown) and recovery. All water level measurements must be referenced from below the ground surface for each time interval specified in the drawdown and recovery boxes.

If the water level measurements remain the same over a period of time, continue to measure and report the same water level measurement for the remaining pumping or recovery time intervals.

If pumping continuously for at least 1 hour, but the design of the well does not allow for water level measurements (e.g., driven point well), the person constructing the well is not required to report drawdown or recovery water level measurements.

Map of Well Location

In the “Map of Well Location” section of the well record form, click the map area to attach a map of the well location. The map must show sufficient information to locate the well, including:

- a mark on the map showing the well,
- a scale on the map, and
- where available, the name of the structure, street or surface water body nearest to the well.

Note: More than one map can be added to the well record form by clicking on “Add Map (+)” to add an additional map.

Information

Record any additional information (e.g., observations, tests, additional licensed well technicians who worked on the well, additional annular space details for a telescoped well or a multi-level nested test hole, reasons for not providing a well owner information package) in the comments area.

Declaration

Check the declaration statement to confirm that the person constructing the well agrees with the following statement: “I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate”.

Validate

Click the validate button. If there is no missing information, you will be asked to enter the well tag again to make sure the well tag is entered correctly (only enter the numeric portion of the tag number). The audit number will then be changed from “**incomplete**” to an assigned audit number. The signature field will then be available. Click on “signature” to enter the well technician’s electronic signature. For instructions on how to create an electronic signature, please visit the Adobe Digital IDs website using the following link: <https://helpx.adobe.com/acrobat/using/digital-ids.html>

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Fields marked with an asterisk (*) are mandatory.

Well Tag Number *

[No Tag on Well](#)

Type *

☐ Construction ☒ Abandonment

Measurement recorded in: *

☐ Metric ☒ Imperial

1. Well Owner's Information

Last Name and First Name, or Organization is mandatory. *

Last Name Attn: Stephanie Huyssen	First Name
Organization City of Barrie	Email Address

Current Address

Unit Number	Street Number * 70	Street Name * Collier Street	City/Town/Village Barrie
Country Canada	Province Ontario	Postal Code L4M 4T6	Telephone Number 705-726-4242

2. Well Location

Address of Well Location

Unit Number	Street Number * n/a	Street Name * Boys Street South X Perry Street	Township Vespra
Lot 24	Concession 5	County/District/Municipality Simcoe	
City/Town Barrie	Province Ontario	Postal Code	
UTM Coordinates NAD 83	Zone * 17	Easting * 603395	Northing * 4915145
			Municipal Plan and Sublot Number

Other
[Job No. 58549](#)

3. Abandonment and Sealing

Well Depth [8.5](#) (ft)

Provide information of well (e.g. construction date, original contractor). **Do not** enter private information
[5ft screen](#)

Original Owner		
General Description	Depth From (ft)	Depth To (ft)
Removed all pipe	0	8.5
Overdrilled	0	6
Backfilled with Bentonite	0	8.5

4. Annular Space			
Depth From (ft)	Depth To (ft)	Type of Sealant Used (Material and Type)	Volume Placed (cubic feet)
0			

5. Method of Construction

☐ Cable Tool
☐ Rotary (Conventional)
☐ Rotary (Reverse)
☐ Boring
☐ Air percussion
☐ Diamond
☐ Jetting
☐ Driving
☐ Digging
☐ Rotary (Air)
☐ Augering
☐ Direct Push
☐ Other (specify)

6. Well Use

☐ Public
☐ Industrial
☐ Cooling & Air Conditioning
☐ Domestic
☐ Commercial
☐ Not Used
☐ Livestock
☐ Municipal
☒ Monitoring
☐ Irrigation
☐ Test Hole
☐ Dewatering
☐ Other (specify)

7. Status of Well

☐ Water Supply
☐ Replacement Well
☐ Test Hole
☐ Recharge Well
☐ Dewatering Well
☐ Observation and/or Monitoring Hole
☐ Alteration (Construction)
☐ Abandoned, Insufficient Supply
☐ Abandoned, Poor Water Quality
☒ Abandoned, other (specify)
☐ Other (specify)

8. Construction Record - Casing (use negative number(s) to indicate depth above ground surface)				
Inside Diameter (in)	Open Hole or Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness	Depth From (ft)	Depth To (ft)

9. Construction Record - Screen

Outside Diameter (in)	Material (Plastic, Galvanized, Steel)	Slot Number	Depth From (ft)	Depth To (ft)

10. Water Details

Water found at Depth (ft) ☐ Gas Kind of water ☐ Fresh ☐ Untested ☐ Other

11. Hole Diameter

Depth From (ft)	Depth To (ft)	Diameter (in)
0		

12. Results of Well Yield Testing

☐ Pumping Discontinued

Explain

If flowing give rate

☐ Flowing (GPM)

Draw down

Time (min)	Static Level	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)														

Recovery

Time (min)	1	2	3	4	5	10	15	20	25	30	40	50	60
Water Level (ft)													

After test of well yield, water was

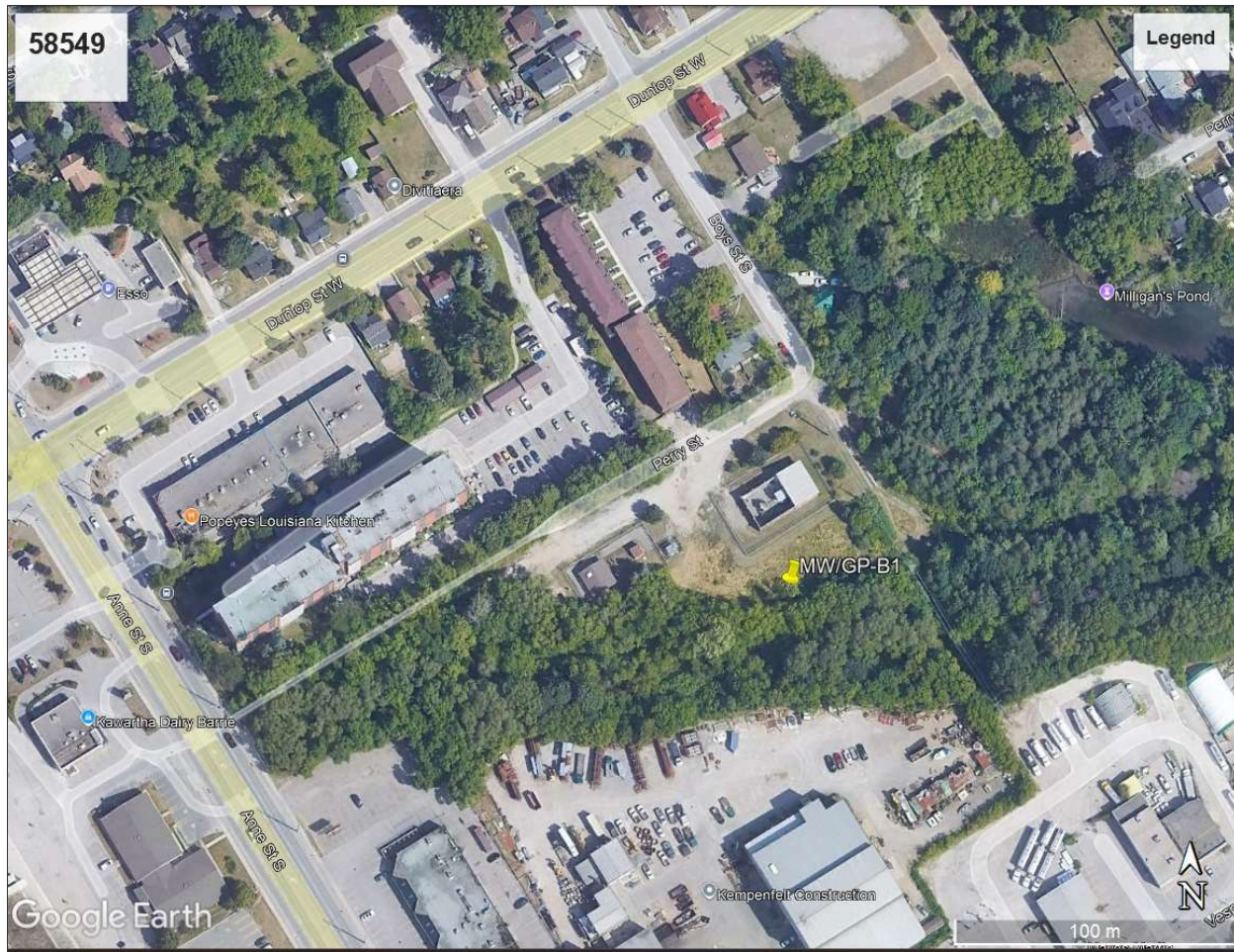
☐ Clear and sand free ☐ Other (specify)

Pump intake set at (ft)	Pumping rate (GPM)	Duration of pumping hrs + min	Final water level end of pumping (ft)	Disinfected? ☐ Yes ☒ No
-------------------------	--------------------	-------------------------------	---------------------------------------	--

Recommended pump depth (ft)	Recommended pump rate (GPM)	Well production (GPM)
-----------------------------	-----------------------------	-----------------------

13. Map of Well Location *

Map 1. Please Click the map area below to import an image file to use as the map. ☐ Make map area bigger



14. Information

Well owner's information package delivered

☐ Yes ☒ No

Date Package Delivered (yyyy/mm/dd)

Date Work Completed (yyyy/mm/dd) *

2024/11/28

Comments

15. Well Contractor and Well Technician Information

Business Name of Well Contractor *

ALTECH Drilling & Investigative Services Ltd.

Well Contractor's License Number *

7282

Business Address

Unit Number

Street Number

1212

Street Name *

Bishop Street North

City/Town/Village *

Cambridge

Province

Ontario

Postal Code *

N3H 2K9

Business Telephone Number

519-650-5557

Business Email Address

Last Name of Well Technician *

Stranz

First Name of Well Technician *

Brandon

Well Technician's License Number *

4021

16. Declaration *

☒ I hereby confirm that I am the person who constructed the well and I hereby confirm that the information on the form is correct and accurate.

Last Name Stranz	First Name Brandon	Email Address bstranz@altechworld.com
Signature Brandon Stranz	 Digitally signed by Brandon Stranz Date: 2024.12.16 11:48:58 -05'00'	Date Submitted (yyyy/mm/dd) 2024/12/16

17. Ministry Use Only

Audit Number 9AM4 LFLH

