



Groundwater Monitoring Program 4380 Trail Road, Ottawa, Ontario

Client:

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Attention:

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Type of Document:

Final

Project Name:

Groundwater Monitoring Program

Project Number:

OTT-21023795-A0

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Date Submitted:

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1 Introduction

1.1 Project Description

EXP Services Inc. (EXP) was retained by GFL Environmental Services Inc. (GFL), previously Drain-All Limited, to conduct seasonal groundwater monitoring events at 4380 Trail Road, hereinafter referred to as the 'Site' (Figure 1). The groundwater monitoring events were conducted in accordance with the document prepared by EXP titled "Proposed Groundwater Sampling Program, 4380 Trail Road, Ottawa, Ontario", dated May 13, 2022.

GFL has been managing inert fill and clean soil at 4380 Trail Road since 2015. These activities are now governed by Ontario Regulation 406/19. Consequently, in December 2020 GFL submitted an Environmental Compliance Approval (ECA) application to the Ministry of Environment Conservation and Parks (MECP) for the continuation of the operation of the soil management activities. This groundwater monitoring program is being conducted in support of an application for an ECA for the Site.

1.2 Project Objectives

The purpose of the groundwater sampling program is to assess for potential impact to the hydrogeological regime due to on-site soil management operations on a seasonal basis. One groundwater monitoring event is to be completed during the drier (lower water table) seasons (i.e., summer or winter) and a second groundwater monitoring event is to be completed during the wetter (higher water table) seasons (i.e., fall or spring). This report documents summer (June 2022), spring (May 2023) and winter (February 2024) groundwater monitoring events.

1.3 Scope of Work

To assess the potential impact to the upper groundwater regime, a semi-annual monitoring program (spring and fall) has been implemented. To achieve the investigation objectives, EXP has completed the following scope of work:

- Monitoring well elevation survey;
- Groundwater elevation measurements were recorded from all seven on-site monitoring wells to establish groundwater flow patterns;
- Groundwater samples were collected from MW-4 and MW-6 to establish baseline groundwater concentrations;
- Groundwater samples were collected from monitoring wells MW-2 (P-2), MW-3, MW-5, due to their proximity to site activities and/or downgradient location from site activities;
- Groundwater samples were submitted for laboratory analysis of metals and inorganics, petroleum hydrocarbons (PHC) fractions F1 to F4, volatile organic compounds (VOC), and polycyclic aromatic hydrocarbons (PAH); and,
- Prepared a report summarizing the results of the monitoring program.

2 Background Information

2.1 Site Setting

2.1.1 Site Description

The Site is located on the south side of Trail Road, east of Moodie Drive, and covers an area of approximately 4.2 hectares. The Site is bounded by the active Trail Road Landfill to the north across Trail Road, and the closed Nepean Landfill to the north and west. The property to the south and west of the Site is referred to as the South Aggregate Pond. Industrial properties are also present in the study area.

Since 2015, GFL has been operating the Site as a receiver site for unimpacted excess soil generated from various construction sites throughout the region. There are two areas where soil is stored on the Site. Incoming excess soil is initially placed in either Zone A for liquid soils (for decanting) or Zone B for dry soils. The soil is then sampled and analyzed for various parameters to confirm suitability for final placement on the site (Figure 2).

There are seven (7) monitoring wells present on the Site. Monitoring wells MW-1 (P-1) and MW-2 (P-2) were installed as part of the Nepean Landfill monitoring program. Monitoring wells MW-3 and MW-4 were also installed prior to GFL's acquisitions but have not been involved in previous groundwater monitoring programs. Based on the results of the preliminary hydrogeological assessment (EXP, 2022), three additional monitoring wells (MW-5, MW-6, and MW-7) were installed at the Site. MW-5 was installed adjacent to Area A where liquid soil decanting activities occur, MW-6 was installed downgradient of on-Site operations, and MW-7 was installed upgradient of site operations. The monitoring well locations are shown on Figure 2.

2.1.2 Site Topography

A topographic survey completed by EXP in February 2022 to a geodetic benchmark (COSINE Station No.: 01019791701V, Vertical Datum: CGVD28:78, Elevation 95.413) indicates the surface elevation of the Site ranges between approximately 99.5 metres above sea level (masl) at the west end of the Site to 101.8 masl at the east end of the Site. Trail Road is approximately 110.5 masl.

As the Site, and surrounding properties to the south (South Aggregate Ponds) have been historically used as aggregate resources and for landfill use, the topography varies significantly locally.

2.1.3 Local Surface Water Features

The Site is located on the north boundary of the Mud Creek watershed.

The following surface water features are present in the vicinity of the Site:

- The Beaver Pond
- The Agricultural Drains
- The infiltration ponds (SW4 and SW5)
- The South Aggregate Ponds
- The Dewatering Pond

The Beaver Pond is located north of the Nepean Landfill site, approximately 1 km west of the Site near the intersection of Moodie Drive and Cambrian Road. The Agricultural Drains are located on the west side of Moodie Drive, approximately 1 km west of the Site. Both the Beaver Pond and the Agricultural Drains discharge to the Leamy Drain, which eventually discharges into the Jock River. The shallow aquifer feeds both waterbodies.

The infiltration ponds were constructed in 1993 when the landfill was capped. The ponds are located at the western boundary of the Nepean Landfill, approximately 600 m west of the Site. The infiltration ponds do not have outlets and are a surface expression of the shallow aquifer. Water re-infiltrates to the shallow aquifer and flows north towards Beaver Pond.

The South Aggregate Ponds (Burnside Ponds) are present south adjacent to the Site. The ponds were generated by aggregate extraction activities on the property. Due to extraction activities, the elevation of the ponds is significantly lower than surrounding properties. The ponds have no outlet and can therefore be considered representative of the local water table (shallow aquifer).

The Dewatering Pond is located north of Cambrian Road, approximately 1.2 km northwest of the Site. It is fed by groundwater discharge from the deep aquifer. A Permit to Take Water (PPTW) is in place for the discharge of water from the Dewatering Pond (Number 3862-89YP6V). The PTTW limits the discharge rate from the Dewatering Pond to 4,500 L/min (6,480,000 L/day). During 2019, the discharge frequently exceeded this rate. The Dewatering Pond discharges to the Jock River.

The presence of these surface water bodies, particularly the Dewatering Pond, influences the groundwater flow patterns in the area. The Dewatering Pond has been observed to influence the groundwater flow direction in the deep aquifer. The monitoring program differentiates the deep aquifer into upper and lower sections. The entire deep aquifer is locally hydraulically controlled by the dewatering pond, which acts as a groundwater discharge point for the deep aquifer.

The expansion of the South Aggregate Pond and the addition of the infiltration ponds to the west and northwest of the landfill have impacted the local groundwater flow patterns in the shallow aquifer.

2.1.4 Local Geology

A summary of subsurface soil stratigraphy is provided in the following paragraphs. The soil descriptions are based on the borehole logs from previous investigations (Appendix B). Based on the borehole logs, the general subsurface soil stratigraphy consists of the following units from top to bottom:

Sand

A layer of fine, medium to coarse-grained, well-sorted sand was present from the surface to between 17 to 37 m bgs. The sand was interbedded with layers of fine to very fine-grained sand.

Silty Cobbly Till

A silty cobble till was encountered overlying the bedrock in MW-1 (P-1) (encountered 17.2 meters below ground surface). This layer consisted of poorly sorted till with cobbles.

Dolostone Bedrock

Bedrock was not encountered in any of the boreholes on the Site. Based on regional maps and previous investigations, bedrock is anticipated to be dolostone of the Oxford Formation and present approximately 30 to 35 m bgs. In boreholes to the southeast and north of the Site, bedrock was encountered at 17 m bgs and 37 m bgs respectively. Bedrock appears to be dipping to the north.

2.1.5 Local Hydrogeology

Static water levels in the monitoring wells installed on the Site were recorded on June 8, 2022, May 5, 2023, and February 1, 2024. A summary of all static water level data as it relates to the elevation survey is provided in Appendix C. Based on the depth to groundwater measurements, there was a difference of 0.24 to 0.43 m difference between wet and dry seasons.

Based on the above water levels, the shallow overburden groundwater flow direction on the Site is to the north (as depicted on Figures 2, 3 and 4).

3 Groundwater Monitoring Program

3.1 Semi-Annual Groundwater Monitoring

To assess the potential impact to the upper groundwater regime, a semi-annual monitoring program (spring, fall and winter) has been implemented. For the June 2022, May 2023 and February 2024 sampling events, groundwater samples were collected

from MW-4 and MW-6, upgradient of on-Site operations, in order to establish baseline conditions. Samples were also collected from MW-2 (P-2), MW-3, MW-5, due to their proximity to site activities and/or downgradient location.

3.2 Applicable Site Condition Standards

Analytical results obtained for groundwater samples will be compared to Site Condition Standards (SCS) established under subsection 169.4(1) of the Environmental Protection Act, and presented in the document entitled *Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, 2011*. This document provides tabulated background SCS (Table 1) applicable to environmentally sensitive sites and effects-based generic SCS (Tables 2 to 9) applicable to non-environmentally sensitive sites. The effects-based SCS (Tables 2 to 9) are protective of human health and the environment for different groundwater conditions (potable and non-potable), land use scenarios (residential, parkland, institutional, commercial, industrial, community and agricultural/other), soil texture (coarse or medium/fine) and restoration depth (full or stratified).

Tables 1 to 9 SCS are summarized as follows:

- Table 1 – applicable to sites where background concentrations must be met (full depth), such as sensitive sites where site-specific criteria have not been derived
- Table 2 – applicable to sites with potable groundwater and full depth restoration
- Table 3 – applicable to sites with non-potable groundwater and full depth restoration
- Table 4 – applicable to sites with potable groundwater and stratified restoration
- Table 5 – applicable to sites with non-potable groundwater and stratified restoration
- Table 6 – applicable to sites with potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 7 – applicable to sites with non-potable groundwater and shallow soils (bedrock encountered at depths of 2 metres or less across one-third or more of the site)
- Table 8 – applicable to sites with potable groundwater and that are within 30 m of a water body
- Table 9 – applicable to sites with non-potable groundwater and that are within 30 m of a water body

Application of the generic or background SCS to a specific site is based on a consideration of site conditions related to soil pH, thickness and extent of overburden material, and proximity to an area of environmental sensitivity or of natural significance. For some chemical parameters, consideration is also given to soil textural classification with SCS having been derived for both coarse and medium-fine textured soil conditions.

For assessment purposes, EXP selected the 2011 Table 2 SCS in a potable groundwater condition for an industrial property use. The selection of this category was based on the following factors:

- Bedrock is greater than 2 metres below grade across the Site;
- There are no surface water bodies within 30 metres of the Site;
- The Site is not located within an area of natural significance, does not include nor is adjacent to an area of natural significance, and does not include land that is within 30 metres of an area of natural significance;
- The Site and properties within 250 m of the Site are not municipally serviced ;
- The Phase Two property is not located in an area designated in a municipal official plan as a well-head protection area;
- The Site is planned for industrial use;
- The overburden unit is considered coarse grained; and,
- It is the opinion of the Qualified Person who oversaw this workplan that the Site is not a sensitive site.

3.3 Groundwater Sampling

Groundwater samples from all monitoring wells were collected via a low-flow sampling technique using a YSI 550 multi-probe water quality meter. The YSI probe was calibrated using in-house reference standards. Prior to collecting the groundwater samples, water quality field parameters (turbidity, dissolved oxygen, conductivity, temperature, pH, and oxidation-reduction potential) were monitored until stable readings were achieved. These parameters are considered to be stable when three consecutive readings meet the following conditions:

- Turbidity: within 10% for values greater than 5 nephelometric turbidity units (NTU), or three values less than 5 NTU;
- Dissolved oxygen: within 10% for values greater than 0.5 mg/L, or three values less than 0.5 mg/L;
- Conductivity: within 3%;
- Temperature: $\pm 1^{\circ}\text{C}$;
- pH: ± 0.1 unit; and,
- Oxidation reduction potential: ± 10 millivolts.

When stabilization occurs, equilibrium between groundwater within a monitor and the surrounding formation water is attained. As such, samples collected when stabilization occurs are considered to be representative of formation water.

The groundwater samples were placed in clean coolers containing ice packs prior to and during transportation to the laboratory. The samples were transported to the laboratory within 24 hours of collection with a chain of custody.

3.4 Groundwater Quality

On June 8, 2022, May 5, 2023, and February 1, 2024 groundwater samples were collected from using the low flow sampling method described above. Five groundwater samples, one duplicate, and one trip blank were submitted for analysis of PHC, VOC, PAH, and inorganics.

A summary of the analytical results are presented in Tables 1, 2 and 3 in Appendix D. Laboratory certificates of analysis are presented in Appendix E.

Based on the analytical results obtained, there were no exceedances of the MECP Table 2 SCS for any of the parameters analyzed during the June 2022, May 2023 and February 2024 sampling events.

4 Conclusions

As part of the semi-annual monitoring program, the first three rounds of groundwater sampling was completed on June 8, 2022, May 5, 2023 and February 1, 2024. Groundwater samples were collected from five wells (MW-2 [P-2] and MW-5 due to proximity to site activities, MW-3 due to downgradient location, and MW-4 and MW-6 to establish baseline levels) and submitted for analysis of VOC, PHC, PAH, and inorganics. All of the groundwater samples were within Table 2 potable groundwater standards for all of the parameters analyzed.

The next round of groundwater sampling should be completed in Fall 2023. All five monitoring wells should be sampled for VOC, PHC, PAH, and inorganics.

5 Limitations

This report is based on a limited investigation designed to provide information to support an assessment of the current hydrogeological conditions within the study area. The conclusions and recommendations presented within this report reflect Site conditions existing at the time of the assessment. EXP must be contacted immediately, if any unforeseen Site conditions

are experienced during construction activities. This will allow EXP to review the new findings and provide appropriate recommendations to allow the construction to proceed in a timely and cost-effective manner.

Our undertaking at EXP, therefore, is to perform our work within limits prescribed by our clients, with the usual thoroughness and competence of the geoscience/engineering profession. No other warranty or representation, either expressed or implied, is included or intended in this report.

This report was prepared for the exclusive use of GFL Environmental Services Inc. This report may not be reproduced in whole or in part, without the prior written consent of EXP, or used or relied upon in whole or in part by other parties for any purposes whatsoever. Any use which a third party makes of this report, or any part thereof, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. EXP Services Inc. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

We trust that this information is satisfactory for your purposes. Should you have any questions or comments, please do not hesitate to contact this office.

Sincerely,

EXP Services Inc.



Momin Malek, P.Eng.
Environmental Engineer
Environmental Services



Chris Kimmerly, M.Sc., P.Geo. QPESA
Senior Geoscientist
Environmental Services




6 References

- EXP Services Inc., Proposed Groundwater Monitoring Program, 4380 Trail Road, Ottawa, Ontario, May 13, 2022
- EXP Services Inc., Groundwater Monitoring, 4380 Trail Road, Ottawa, Ontario, June 16, 2023.

Appendix A – Figures

Filename: \\exp\data\OTT\OTT-21023795-A0\60 Execution\65 Drawings\21023795 - Figure 1.dwg
 Last Saved: Jul 13, 2022 9:55 AM Last Plotted: Jul 13, 2022 9:55 AM Plotted by: Severa



exp Services Inc. 100-2650 Queensview Drive Ottawa, ON K2B 8H6 www.exp.com		DESIGN CK / LW	GROUNDWATER SAMPLING PROGRAM 4380 TRAIL ROAD, OTTAWA, ONTARIO	SCALE 1:25,000
		DRAWN AS		SKETCH NO
		DATE FEBRUARY 2024		FIG 1
		FILE NO OTT-21023795	SITE LOCATION PLAN	



LEGEND

— SITE BOUNDARY

⊕ MONITORING WELL NAME AND LOCATION (GROUNDWATER ELEVATION)

→ GROUNDWATER FLOW DIRECTION

*GROUNDWATER ELEVATIONS FROM MAY 25, 2022

MW-5 GROUNDWATER SAMPLE LOCATION

(95.75m) GROUNDWATER CONTOUR ELEVATION

(96.20m) GROUNDWATER ELEVATION

(96.43m)* ELEVATION NOT USED

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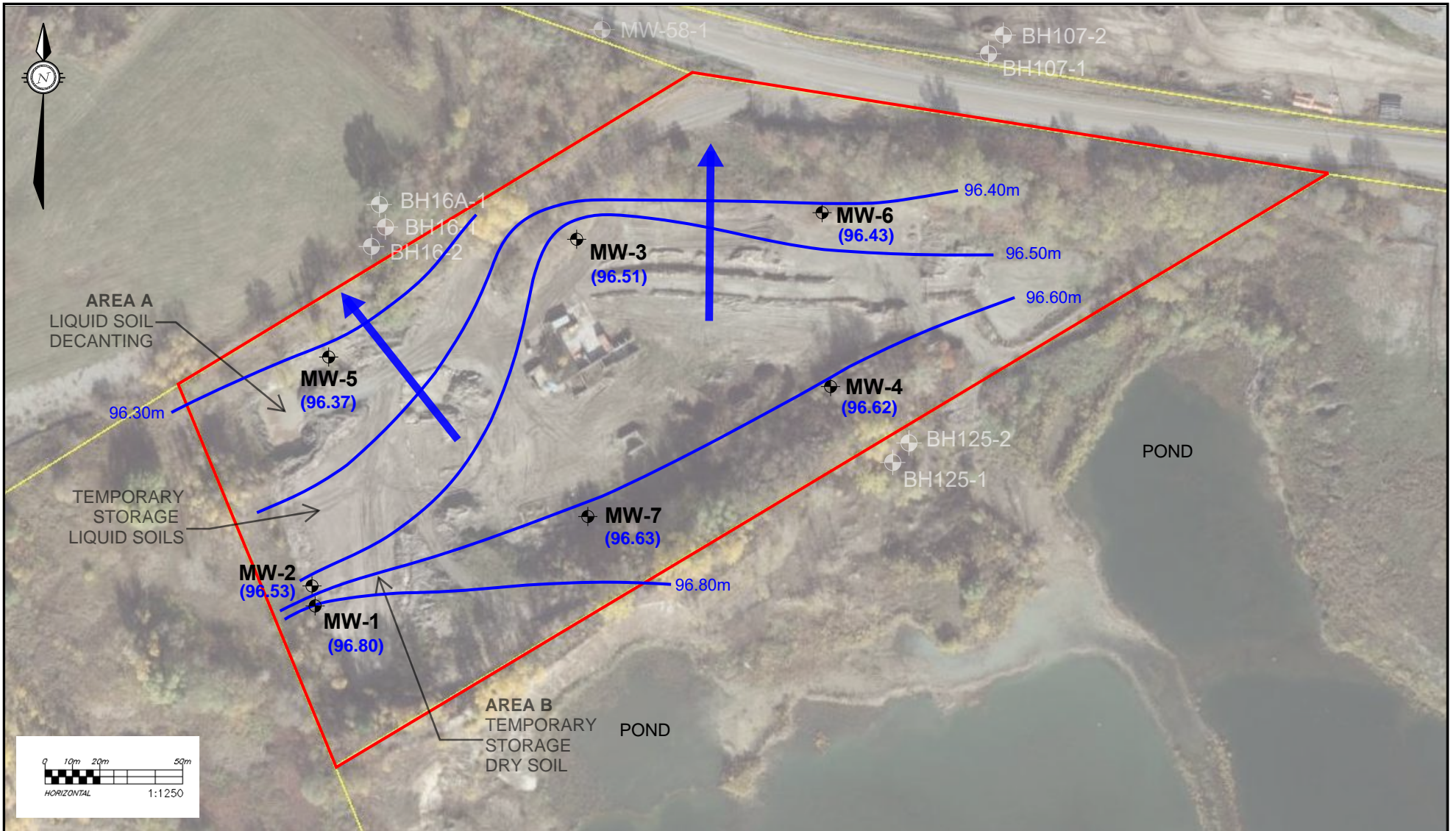
DESIGN CK / LW
 DRAWN LW / AS
 DATE JULY 2022
 PROJECT NO. OTT-21023795-A0

GROUNDWATER SAMPLING PROGRAM
 4380 TRAIL ROAD, OTTAWA, ONTARIO

GROUNDWATER SAMPLING LOCATIONS & FLOW DIRECTION
 JUNE 8, 2022

SCALE 1:1250

FIG 2



LEGEND
 SITE BOUNDARY
 MONITORING WELL NAME AND LOCATION (GROUNDWATER ELEVATION)

MW-5 GROUNDWATER SAMPLE LOCATION
 GROUNDWATER FLOW DIRECTION
 *GROUNDWATER ELEVATIONS FROM MAY 5, 2023

(95.75m) GROUNDWATER CONTOUR ELEVATION
 (96.80m) GROUNDWATER ELEVATION

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DESIGN	CK / LW
DRAWN	LW / AS
DATE	JUNE 2023
PROJECT NO.	OTT-21023795-A0

GROUNDWATER SAMPLING PROGRAM 4380 TRAIL ROAD, OTTAWA, ONTARIO
GROUNDWATER SAMPLING LOCATIONS & FLOW DIRECTION MAY 5, 2023

SCALE 1:1250
FIG 3



LEGEND
 SITE BOUNDARY
 MONITORING WELL NAME AND LOCATION (GROUNDWATER ELEVATION)

MW-5 GROUNDWATER SAMPLE LOCATION
 GROUNDWATER FLOW DIRECTION
 *GROUNDWATER ELEVATIONS FROM MAY 5, 2023

(95.75m) GROUNDWATER CONTOUR ELEVATION
 (96.80m) GROUNDWATER ELEVATION

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 DRAWN LW / AS
 DATE FEBRUARY 2024
 PROJECT NO. OTT-21023795-A0

GROUNDWATER SAMPLING PROGRAM
 4380 TRAIL ROAD, OTTAWA, ONTARIO

GROUNDWATER SAMPLING LOCATIONS & FLOW DIRECTION
 FEBRUARY 1, 2024

SCALE
 1:1250

FIG 4

Appendix B – Borehole Logs

Borehole No. 10

0" - 15'0" Brown medium sands, thin layered.
15'0" - 38'0" Grey thin layered clay, occasional fine sand seam, saturated.
38'0" - 40'0" Bouldery sand and gravel, saturated.
Borehole terminated at 40'0" in sand and gravel.

Borehole No. 11

0" - 13'0" Brown fine to medium sand, rust stained.
13'0" - 22'0" Grey clay, interlayered with thin sand seams and occasional thin gravel layer, saturated.
22'0" - 29'0" Predominantly sand and gravel. Some thin clay layers, saturated.
29'0" - 32'0" Bouldery sand and gravel, some silt, saturated.
Borehole terminated at 32'0"

Borehole No. 12

0" - 7'0" Brown medium sand, rust stains.
7'0" - 17'0" Interlayered silt and clay with fine sand, saturated.
17'0" - 21'0" Sand and gravel.
21'0" - 53'0" Grey very fine sand.
53'0" - 65'0" Grey medium sand, grading into coarse sand at 65'0".
65'0" - 80'0" Grey coarse sand grading into coarse gravel at 80'0".
Borehole terminated at 80'0".

Borehole No. 13

0" - 75'0" Brown medium sand, layered with fine and coarse sand, saturated after 30'0".
75'0" - 82'0" Coarse cobbly gravel, saturated.
Borehole terminated at 82'0" with refusal on boulders.

Borehole No. 14

0" - 28'0" Brown medium sand.
28'0" - 38'0" Grey clay, interlayered with silt and fine sand, saturated.
38'0" - 60'0" Grey fine to medium sand, with some silt and clay layers, saturated.
Borehole terminated at 60'0".

Borehole No. 15

0" - 1'0" Black organic topsoil.
1'0" - 2'4" Brown fine sand.
2'4" - 4'6" Grey clay.
4'6" - 20'0" Bouldery gravel and sand, some silt, saturated.
Borehole terminated at 20'0"

Borehole No. 16

0" - 95'0" Brown medium sand, some fine and coarse sand layers.
Borehole terminated at 95'0".

Borehole No. 17

0" - 18'0" Brown coarse sand with coarse gravel layers.
18'0" - 22'0" Bouldery gravel.
22'0" - 75'0" Brown coarse sand with some gravel, saturated after 40'0".
75'0" - 90'0" Grey medium sand, saturated.
Borehole terminated at 90'0".

**GROUND WATER MONITOR INSTALLATION DETAILS
TRAIL ROAD LANDFILL SITE**

TABLE IV

Borshole No.	Pipe No.	PVC Pipe Diameter	Monitor Type	Elevation of Monitor Tip	Elevation of Bentonite Seal	Remarks
1	1	3/4"	*P	272.0	-	No seals placed in this borshole
	11	3/4"	P	290.5	-	
	111	3/4"	P	314.5	-	
	1111	3/4"	**S	328.5	-	
2	1	3/4"	P	287.8	290.1-289.6	
	11	3/4"	P	297.8	300.3-299.1	
	111	3/4"	P	307.1	-	
	1111	3/4"	S	323.8	-	
3	1	1-1/2"	P	378.5	-	
	11	3/4"	P	308.0	-	
	111	3/4"	S	326.5	-	
4	1	1-1/2"	P	292.9	298.4-295.4	
	11	1-1/2"	P	316.9	-	
	111	3/4"	S	326.4	-	
5	1	3/4"	P	291.5	294.5-293.5	
	11	3/4"	P	300.5	-	
	111	3/4"	P	320.0	-	
	1111	3/4"	S	327.5	-	
6	1	3/4"	P	289.0	272.5-271.5	
	11	3/4"	P	282.0	285.5-284.5	
	111	3/4"	P	302.5	-	
	1111	3/4"	S	328.5	-	
7	1	1-1/2"	P	282.3	265.3-284.3	
	11	3/4"	P	289.3	288.8-297.8	
	111	3/4"	P	309.3	302.3-301.3	
	1111	3/4"	P	315.8	-	
8	1	1-1/2"	P	304.7	307.7-308.7	
	11	3/4"	P	314.7	-	
	111	3/4"	S	316.7	-	
	1111	1-1/2"	S	305.3	-	
9	1	1-1/2"	P	307.9	-	
	11	3/4"	S	315.4	-	
	111	3/4"	P	291.6	294.8-293.8	
10	1	3/4"	P	305.6	308.6-307.6	
	11	1-1/2"	S	317.6	-	
	111	3/4"	P	307.7	-	
11	1	3/4"	P	307.7	-	
	11	1-1/2"	S	322.2	-	
	111	3/4"	P	284.5	328.0-327.0	
12	1	3/4"	P	290.8	328.0-327.0	
	11	3/4"	P	316.5	328.0-327.0	
	111	3/4"	P	316.5	328.0-327.0	
	1111	1-1/2"	S	322.0	-	
13	1	3/4"	P	286.6	-	
	11	3/4"	P	292.1	-	
	111	3/4"	P	312.1	-	
	1111	1-1/2"	S	314.1	-	
14	1	1-1/2"	P	296.1	313.8-312.6	
	11	3/4"	P	317.6	320.6-319.6	
	111	1-1/2"	S	330.6	-	
15	1	1-1/2"	P	314.3	329.3-328.3	
	11	1-1/2"	S	316.8	-	
16	1	1-1/2"	P	283.1	-	
	11	1-1/2"	S	318.1	-	
17	1	1-1/2"	P	285.3	-	
	11	1-1/2"	S	320.3	-	
18	1	1-1/2"	P	305.9	318.9-317.9	
	11	1-1/2"	S	321.9	-	
19	1	3/4"	P	300.7	307.2-308.2	
	11	3/4"	S	314.2	-	
20	1	3/4"	S	319.5	-	
	11	3/4"	P	282.1	-	
21	1	3/4"	S	317.6	-	
	11	3/4"	P	292.1	300.1-299.1	
22	1	3/4"	S	313.1	-	
	11	3/4"	S	327.6	-	
23	1	3/4"	S	300.3	-	
	11	3/4"	S	313.3	-	
24	1	3/4"	P	278.1	-	
	11	3/4"	S	313.3	-	
25	1	3/4"	P	228.8	-	Pipe destroyed
	11	3/4"	P	278.1	308.1-307.1	
26	1	3/4"	P	316.1	-	
	11	3/4"	S	323.6	-	
27	1	1-1/2"	S	310.8	-	
	11	1-1/2"	P	284.0	-	
28	1	1-1/2"	S	317.5	-	
	11	1-1/2"	S	278.1	284.1-283.1	
29	1	3/4"	P	278.1	-	
	11	1-1/2"	S	328.1	-	

*P - Piezometer

**S - Standpipe

PROJECT: 991-2806

RECORD OF BOREHOLE: BH16A

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 14, 1999

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		Gastechlor ppm				HYDRAULIC CONDUCTIVITY, k cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER TYPE	100	200	300	400	10 ⁻⁴	10 ⁻⁵	10 ⁻⁶	10 ⁻⁷		
0		Ground Surface		113.30											
		Compact to dense light brown stratified fine SAND, occasional to trace silt.		0.00	1 50 DO										Cement Seal
					2 50 DO										Native Backfill
5					3 50 DO										Bentonite Seal
					4 50 DO										
10		Dense to compact brown to grey fine to medium stratified SAND, occasional coarse sizes, occasional to trace silt		103.96 9.34	5 50 DO										Native Backfill
					6 50 DO										
					7 50 DO										
15					8 50 DO										
					9 50 DO										
20	Power Auger 200mm Diam (Hollow Stem)				10 CS										Caved Material
					11 CS										
25					12 CS										
30															Bentonite Seal
															Granular Filter
35		END OF BOREHOLE		78.25 35.05											38mm PVC #10 Slot Screen #1

BOREHOLE 991-2908.GPJ HYDROGEO.GDT 2 6 01

DEPTH SCALE

1 : 200



LOGGED: D.J.S.

CHECKED: AW

Project No: 03-1387-8002

Project: Trail Rd. Stg. 2 LFG Investigation **Borehole ID: GM12**

Client: City of Ottawa

Location: South side of Trail Road

Supervised By: E. Shilts



SUBSURFACE PROFILE				WELL DATA		Remarks
Depth	Symbol	Description	Elevation	A	B	
ft m						
-4						
		Ground Surface	0			25mm-dia. sched-40 PVC with needle valve on slip cap.
1		Gravel and Sand Grey-brown, loose, dry road base gravel.	-1			Backfill to surface.
6		Fine Sand Grey-brown, loose, dry fine sand.				Bentonite seal
11						
16		Sand and Gravel Brown, dry, loose, medium sand and gravel.	-5			#3 Morie sand pack #10 screen
21						
26						
31		Medium Sand Brown, dry, loose, medium sand.	-9			Bentonite seal
36						
41						
46						#3 Morie sand pack #10 screen
		End of Borehole	-15			

Drilled By: EAD
 Drill Method: Hollow Stem Auger
 Drill Date: March 31, 2003
 Vapour Unit:

Dillon Consulting Limited
 5310 Canotek Rd.,
 Gloucester, Ontario, K1J 9N5
 (613) 745-2213

Hole Size: 150 mm
 Datum:
 Sheet: 1 of 1
 Top of Casing:

E-326

BOREHOLE NO. M1

PROJECT NAME Trail Road Landfill PROJECT NO. 83-10
 CLIENT Regional Municipality of Ottawa-Carleton DATE May 4, 1977
 BOREHOLE TYPE 3 1/2" Hollow Stem Auger GEOLOGIST JH
 ELEVATION 108.7 m ASL TECHNOLOGIST _____

DEPTH ELEV.	STRATIGRAPHY	DESCRIPTION	SAMPLE				GROUND WATER	REMARKS
			NO.	TYPE	BLOWS/FT.	% WATER		
0'		<p><u>Sand</u></p> <p>Primarily brown medium grained sand with minor gravel layers</p>						
50'		<p>Borehole terminated at 50' in sand.</p>						

E-84

BOREHOLE LOG	PROJECT: 88-218	BOREHOLE: M34
Ground Water and Gas Monitor Installation Trail Rd. Landfill FOR: Regional Municipality of Ottawa-Carlton		DATE: 29 June 1988 GEOLOGIST LD ELEVATION 103.2 m ASL

DEPTH (m)	STRATIGRAPHIC DESCRIPTION	SAMPLE	N VALUE				WATER CONTENT (%)													
			15	30	45	60	10	20	30	40										
0.4	TOPSOIL																			
1	SAND Light grey brown medium and fine sand with some silt. Diminishing medium sand with depth. Moist, saturated seam between 6.6 m and 6.7 m. Saturated below about 12 m.	1	SS	16																
2		2	SS	17																
3																				
4																				
5			3	SS	38															
6			4	SS	46															
7			5	SS	57															
8																				
9																				
10																				
11		6	SS	52																
12	Sample 7: Gravel 0% Sand 85.6% Silt 12.3% Clay 2.1%	7	SS	52																
13																				
14																				
15.2	Borehole terminated in sand at 15.2 m.																			

BOREHOLE LOG	PROJECT: 89-258	BOREHOLE: M58
Stage III Trail Rd. Landfill FOR: Regional Municipality of Ottawa-Carleton	DATE: 1 September 1989 GEOLOGIST LD ELEVATION 111.9 m ASL	

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE				N VALUE				WATER CONTENT (%)							
				NUMBER	TYPE	N VALUE	% WATER	% REC	% RQD										
										15	30	45	60	10	20	30	40		
0.2		TOPSOIL																	
		COURSE SAND Red brown course sand with some pebbles and cobbles. Moist.			CS														
0.9		SILT AND CLAY Grey silt and clay intermixed with 2 - 10 cm layers of course and medium sand. Considerable staining.			CS														
1.8		FINE SAND Light brown fine sand with some silt. Moist.			CS														
2					CS														
3					CS														
4					CS														
5					CS														
6					CS														
7					CS														
8					CS														
9.1		COARSE AND MEDIUM SAND Medium brown coarse and medium sand with few pebbles. Pebble layer at lower contact. Moist.			CS														

Environmental Strategies Limited

BOREHOLE LOG	PROJECT: 89-258	BOREHOLE: M58
Stage III Trail Rd. Landfill FOR: Regional Municipality of Ottawa-Carleton	DATE: 1 September 1989 GEOLOGIST LD ELEVATION 111.9 m ASL	

DEPTH (m)	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	MONITOR DETAILS & NUMBER	SAMPLE					N VALUE				WATER CONTENT (%)							
				NUMBER	INTERVAL	TYPE	N VALUE	% WATER	% REC	% RQD										
											15	30	45	60	10	20	30	40		
11						CS														
12						CS														
12.8																				
13		FINE SAND Fine light brown sand. Wet				CS														
13.7																				
14		MEDIUM AND COARSE SAND Medium brown coarse and medium sand. Wet to saturated below about 14 m. Cobbles inferred from drilling progress below about 15.3 m.				CS														
15						CS														
16																				
16.8		Borehole terminated in coarse sand and cobbles at 16.8 m.																		

PROJECT: 991-2806

RECORD OF BOREHOLE: M107

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: January 26, 1999

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE			SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT					
								Cu, kPa	nat V. rem V.	+ ⊕	Q - U	⊙ ○	Wp	W			Wl
0		Ground Surface		111.07													
		Brown silty sand, trace gravel (FILL)		110.16											Cement Seal Bentonite Seal Granular Filter 25mm PVC #10 Slot Gas Monitor Bentonite Seal		
		Brown fine sand, scattered trace gravel (FILL)		109.36	1	50 DO	22										
		Brown SILTY fine SAND, trace gravel		1.83													
		Dark brown silty sand TOPSOIL		108.17													
		Compact to dense brown SAND and GRAVEL, occasional cobble and boulder		2.90	2	50 DO	19										
		Compact brown fine to coarse SAND		107.26													
		Brown SAND and GRAVEL, some cobbles, occasional boulder		3.81	3	50 DO	85										
				95.53													
		Probably mainly sands, occasional trace of gravel or cobble		15.54													
20	Rotary Drilling HW Casing													Native Backfill			
				73.18	4	NO RC	DD										
		Slightly weathered grey LIMESTONE BEDROCK, trace calcite and very thin shale interbed		37.89	5	NO RC	DD										
		END OF BOREHOLE		71.57	6	NO RC	DD										
40	Rotary Drilling NQ Core			39.50										50mm PVC #10 Slot Screen			

BOREHOLE 991-2806.GPJ HYDROGEO.GDT 2 6 01

DEPTH SCALE

1 : 200



LOGGED: D.J.S.

CHECKED: AH

PROJECT: 011-2929

RECORD OF BOREHOLE: M107-2

SHEET 1 OF 1

LOCATION: SEE SITE PLAN

BORING DATE: NOV 12, 2001

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	20	40	60	80	10 ⁴	10 ⁵	10 ⁴		
0		GROUND SURFACE		111.17												
		Brown silty sand, trace gravel (FILL)		0.00	1	50 DO	6									
		Brown fine sand, scattered trace gravel (FILL)		0.30												
		Brown SILTY fine SAND, trace gravel		110.26												
				0.91												
				109.49												
2		Dark brown silty sand TOPSOIL		1.63												
		Compact to dense brown SAND and GRAVEL, occasional cobble and boulder		106.27												
				2.90	2	50 DO	5									
		Compact brown fine to coarse SAND		107.36												
				3.81												
4		Brown SAND and GRAVEL, some cobbles, occasional boulder														
6																
8																
10																
12																
14																
16		Probably mainly sands, occasional trace of gravel or cobble		95.63												
				15.94												
				94.11	3	50 DO	37									
				17.08												
18		END OF BOREHOLE STRATIGRAPHY INFERRED FROM DEEP BOREHOLE														
20																

BOREHOLE 011-2929 GPJ GLDR CAN.GDT 21/302 M.A.C.

Native Backfill

Bentonite Seal

Granular Filter

32 mm PVC #10 slot screen

W.L. in screen at elev. 95.63 m on Dec. 3, 2001 (top of pipe at elev. 111.88 m on Nov. 12, 2001)

DEPTH SCALE

1 : 100



E-290A

LOGGED: C.A.S.

CHECKED: ---

PROJECT: 011-2930

RECORD OF BOREHOLE: M125-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: November 20, 2001

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH Cu, kPa				WATER CONTENT PERCENT					
								20	40	60	80	nat V. rem	+ V. ⊕			U - ⊙	○
0	POWER AUGER 200 mm Diam. (Hollow Stem)	Ground Surface		97.17	1	50 DO										Bentonite Seal Native Backfill Bentonite Seal Silica Sand 50 mm PVC #10 slot screen A Bentonite Seal	
		Loose to dense brown to grey fine SAND, trace silt		0.00	2	50 DO											
5					3	50 DO											
					4	50 DO	37										
10					5	50 DO	13										
					6	50 DO	14										
15	ROTARY DRILL NQ Core	Fresh grey LIMESTONE BEDROCK		79.49	7	NQ RC											
				17.68	8	NQ RC											
20				76.97													
20.20		END OF BOREHOLE		20.20													
25																	
30																	
35																	
40																	
45																	
50																	
W.L. in screen at elev. 96.57 m on Dec. 3, 2002 (top of pipe (screen A) at elev. 97.97 m on Jan. 29, 2002)																	

BOREHOLE 011-2930.GPJ HYDROGEO.GDT 4 8 02

DEPTH SCALE
1 : 250



E-324

LOGGED: [Signature]
CHECKED: [Signature]

PROJECT: 011-2930

RECORD OF BOREHOLE: M125-2

SHEET 1 OF 1

LOCATION:

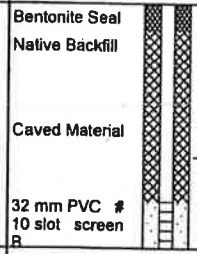
BORING DATE: 18 January 2002

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION		
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	NUMBER	TYPE	BLOWS/0.3m	SHEAR STRENGTH				WATER CONTENT PERCENT					
								20		40		60				80	
0		Ground Surface		97.16													
		For stratigraphy refer to record of borehole M125-1		0.00													
5																	
				89.17													
		END OF BOREHOLE		7.99													
10																	
15																	
20																	
25																	
30																	
35																	
40																	
45																	
50																	



(top of pipe (screen B) at elev. 98.06 m on Jan. 29, 2002)

BOREHOLE 011-2930.GPJ HYDROGEO.GDT 2/13/02

DEPTH SCALE
1 : 250



E-325

LOGGED: D.J.S.
CHECKED:

DILLON

PROJECT No.: 95-2953
DATUM: GEOIDETIC

BOREHOLE: P-1
SHEET: 1 of 2

PROJECT: NEPEAN LANDFILL BUFFERLANDS ASSESSMENT
LOCATION: FORMER BAKERMEY PROPERTY

DATE: July 14/98
GEOLOGIST: D.T.B

DEPTH (m)	ELEVATION	LITHOLOGY	DESCRIPTION	SAMPLES				MONITOR INSTALLATION
				NUMBER	INTERVAL	TYPE	% WATER CONTENT	
			PIEZOMETER TOP: 99.000 m GROUND ELEVATION: 98.91 m					
0	100.0		0.00 - 2.44 m., SAND, Fine grained occasional cobbles, dry, compact					
-1	99.0					AS		
-2	98.0		numerous boulders			AS		
			2.44 - 3.05 m., SAND, Fine grained, some silt, damp to moist, compact					
-3	97.0		3.05 - 7.01 m., SAND, med. to coarse grained, some fine grained sand, wet			SS	32 67	
-4	96.0					AS		
-5	95.0					AS		
-6	94.0							
-7	93.0		7.01 - 8.53 m., SAND, coarse grained with med. grained sand, wet, Firm, well sorted			SS	30 67	
-8	92.0							
-9	91.0		8.53 - 12.50 m., SAND, med. grained, some coarse, med. density, wet, well sorted			SS	20 83	
-10	90.0							

DILLON		PROJECT No.: 95-2953 DATUM: GEODETTIC		BOREHOLE: P-1 SHEET: 2 of 2					
PROJECT: NEPEAN LANDFILL BUFFERLANDS ASSESSMENT LOCATION: FORMER BAKERMET PROPERTY				DATE: July 14/95 GEOLOGIST: D.T.B					
DEPTH (m)	ELEVATION	LITHOLOGY	DESCRIPTION PIEZOMETER TOP: 99.800 m GROUND ELEVATION: 98.910 m	SAMPLES				MONITOR INSTALLATION	
				NUMBER	INTERVAL	TYPE	N VALUE		% REC
11	99.0	[Pattern]	8.53 - 12.50 m., SAND, med. grained, some coarse, med. density, wet, well sorted rusty red stain in water			SS	20		
12	98.0								
13	97.0	[Pattern]	12.50 - 14.17 m., SAND, med and fine grained, brown, firm			SS	29	75	
14	96.0						25	71	
15	95.0	[Pattern]	14.17 - 15.85 m., SAND, very fine grained, silty, moist to wet, grey, well sorted, firm				6	67	
16	94.0								
17	93.0	[Pattern]	15.85 - 16.92 m., SAND, med. to coarse grained, grey, wet difficult drilling						
18	92.0								
19	91.0	[Pattern]	16.92 - 17.22 m., SAND, very fine grained, silty, wet			SS	30	83	
20	90.0			17.22 - 18.92 m., TILL, poorly sorted, firm, cobbles, wet, poorly consolidated					
			boulder REFUSAL DEPTH 18.92 metres			CS		100	

Appendix C – Groundwater Elevations

Job No. 21023795-A0
 4380 Trail Road, Ottawa, ON
 Monitoring Wells Survey Records
 Survey Instrument: Leica GPS
 Surveyed By: Franki Lee
 Co-ordinate System: UTM18 NAD83

Well No.	Northing (m)	Easting (m)	Ground Elev. (m)	Top of MW (m)	8-Jun-22			5-May-23			1-Feb-24		
					Water level (m btoc)	GW Elevation	Water Level (mbgs)	Water level (m btoc)	GW Elevation	Water Level (mbgs)	Water level (m btoc)	GW Elevation	Water Level (mbgs)
MW-1	500880.03	439622.65	99.58	100.49	4.08	96.41	3.2	3.69	96.80	2.78	3.99	96.50	3.08
MW-2	5008803.15	439622.07	99.66	100.60	4.5	96.10	3.6	4.07	96.53	3.13	4.31	96.29	3.37
MW-3	5008926.34	439715.13	101.23	101.89	5.7	96.19	5.0	5.38	96.51	4.72	5.67	96.22	5.01
MW-4	5008874.51	439801.29	100.90	101.47	5.23	96.24	4.7	4.85	96.62	4.28	5.19	96.28	4.62
MW-5	5008886.09	439629.07	101.54	102.40	6.33	96.07	5.5	6.03	96.37	5.16	6.28	96.12	5.41
MW-6	5008933.24	439798.79	103.12	104.14	8.05	96.09	7.0	7.71	96.43	6.68	8.04	96.10	7.02
MW-7	5008830.82	439717.43	100.77	101.74	5.46	96.28	4.5	5.11	96.63	4.14	5.37	96.37	4.40

Note:

All elevation referred to COSINE Station: 01019791701V, Datum: CGVD28:78, Elevation: 95.413 m.
 Accuracy of the Leica GPS checked on COSINE Station: 01019791701V, level difference 25mm is acceptable.

Appendix D – Analytical Tables

Table 1 - Analytical Results in Groundwater - PHC
4380 Trail Road Road, Ottawa, Ontario
OTT-21022798-A0

Parameter	MW-6			Trip Blank			Field Blank	
	9-Jun-2022	5-May-2023	1-Feb-2024	9-Jun-2022	5-May-2023	1-Feb-2024	5-May-2023	1-Feb-2024
Sampling Date	9-Jun-2022	5-May-2023	1-Feb-2024	9-Jun-2022	5-May-2023	1-Feb-2024	5-May-2023	1-Feb-2024
Screen Depth (mgs)	5.9 to 9.0	5.9 to 9.0	5.9 to 9.0	N/A	N/A	N/A	N/A	N/A
Volatile Organic Compounds								
Acetone	< 30	< 30	< 30	< 30	< 30	< 31	< 30	< 30
Benzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5
Bromochloromethane	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Bromoform	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Bromomethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
Dibromochloromethane	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dichlorodifluoromethane	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
1,2-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichloropropane, total	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylene dibromide (dibromoethane, 1,2-)	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Hexane	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Methyl Ethyl ketone (2-Butanone)	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl isobutyl ketone	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
Methyl tert-butyl ether	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methylene Chloride	< 5	< 5	< 5	< 5	< 5	< 5	< 5	< 5
Styrene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Tetrachloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1-Trichloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	< 5	< 5	< 5	< 5	< 5	< 6	< 5	< 5
Vinyl Chloride	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.3	< 0.2	< 0.2
m,p-Xylene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.1	< 1.0	< 1.0
o-Xylene	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.6	< 0.5	< 0.5
Xylenes, total	< 1.1	< 1.1	< 1.1	< 1.1	< 1.1	< 1.2	< 1.1	< 1.1
Petroleum Hydrocarbons								
F1 PHC (C9 - C10) - BTEX*	< 25	< 25	< 25	-	-	-	-	-
F2 PHC (C10-C16)	< 50	< 50	< 50	-	-	-	-	-
F3 PHC (C16-C34)	< 400	< 400	< 400	-	-	-	-	-
F4 PHC (C34-C50)**	< 400	< 400	< 400	-	-	-	-	-

NOTES:

- 1
- *
- **
- ND
- NV
- N/A
-
- m bgs

Table 2 - Analytical Results in Groundwater - PAH
4380 Trail Road Road, Ottawa, Ontario
OTT-21023786-A0

Parameter	Units	MECP Table 2 ¹			MW-2 (P2)			MW-9 (Field Duplicate to MW-2)	MW-3			DUP 1 (Field Duplicate MW-3)	MW-4			MW-5			P3 (Field Duplicate of MW-5)	MW-6		
		Orange			8-Jun-2022	5-May-2023	1-Feb-2024	8-Jun-2022	5-May-2023	1-Feb-2024	8-Jun-2022	5-May-2023	1-Feb-2024	8-Jun-2022	5-May-2023	1-Feb-2024	8-Jun-2022	5-May-2023	1-Feb-2024	8-Jun-2022	5-May-2023	1-Feb-2024
		Orange			Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Volatiles Organic Compounds																						
Acetophenone	ug/L	4.3	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Acenaphthylene	ug/L	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Anthracene	ug/L	2.4	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo[a]anthracene	ug/L	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo[a]pyrene	ug/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Benzo[b]fluoranthene	ug/L	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo[b]fluoranthene	ug/L	NV	<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	<0.1	<0.1	<0.1	<0.1	<0.1	
Benzo[k]fluoranthene	ug/L	0.7	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo[e]fluoranthene	ug/L	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Chrysene	ug/L	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluorene	ug/L	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluoranthene	ug/L	0.41	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluorene	ug/L	120	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Indene(1,2,3-cd)pyrene	ug/L	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Methylanthracene-2	ug/L	3.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Methylanthracene-2	ug/L	3.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Methylanthracene-2 (L1)	ug/L	3.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Naphthalene	ug/L	11	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Phenanthrene	ug/L	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Pyrene	ug/L	4.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	

NOTES:

- 1 Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 2 Generic Site Condition Standards in a Potable Ground Water Condition for all types of Property Use (coarse textured soils).
- * F1 fraction does not include BTEX.
- ++ In instances where the PNC T2 to T4 chromatogram did not reach baseline, the T4 fraction result shown is the highest value obtained via the gas chromatography/mass ionization detection method or the gravimetric method.
- ND Non-detectable results are shown as "< (BDL)" where BDL represents the reporting detection limit.
- NV No Value
- N/A Not Applicable
- Parameter not analyzed
- m bgs Metres below ground surface
- Indicates groundwater exceedance of MECP Table 2 SCS

Table 3 - Analytical Results in Groundwater - Metals and Inorganics
4380 Trill Road Road, Ottawa, Ontario
OTT-21023798-AD

Parameter	Units	MECP Table 2 ¹	MW-2 (P2)			MW-9 (Field Duplicate to MW-2)	MW-3			DUP 1 (Field Duplicate MW-3)	MW-4			MW-5			P3 (Field Duplicate of MW-5)	MW-6		
		Orange	9-Jun-2022 Unknown	5-May-2023 Unknown	1-Feb-2024 Unknown	1-Feb-2024 Unknown	9-Jun-2022 Unknown	5-May-2023 Unknown	1-Feb-2024 Unknown	9-Jun-2022 Unknown	5-May-2023 Unknown	1-Feb-2024 Unknown	9-Jun-2022 3.6 to 6.7	5-May-2023 3.6 to 6.7	1-Feb-2024 3.6 to 6.7	9-May-2024 3.6 to 6.7	9-Jun-2022 3.9 to 9.0	5-May-2023 3.9 to 9.0	1-Feb-2024 3.9 to 9.0	
Metals																				
Antimony	µg/L	6	<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	<0.1	<0.1	<0.1	
Arsenic	µg/L	25	0.15	0.15	0.15	0.15	<0.1	<0.1	<0.1	0.20	<0.1	<0.1	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
Barium	µg/L	1000	106.00	59.00	59.00	97.00	259.00	239.00	339.00	257.00	361.00	272.00	498.00	178.00	189.00	240.00	167.00	137.00	55.00	174.00
Beryllium	µg/L	4	<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	<0.1	<0.1	<0.1	
Boron	µg/L	5000	22.00	24.00	18.00	18.00	59.00	119.00	183.00	57.00	34.00	74.00	33.00	39.00	51.00	62.00	52.00	105.00	60.00	107.00
Cadmium	µg/L	2.7	<0.015	<0.015	0.015	<0.015	<0.015	<0.015	<0.015	<0.015	0.02	<0.015	0.02	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	
Chromium	µg/L	150	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Chromium (VI)	µg/L	23	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
Cobalt	µg/L	4	<0.1	<0.1	0.20	0.10	<0.1	<0.1	0.20	<0.1	1.40	0.20	<0.1	0.20	<0.1	0.70	<0.1	0.70	<0.1	0.20
Copper	µg/L	87	<1	<1	1.70	1.70	<1	<1	2.80	<1	<1	2.00	1.80	2.00	2.00	2.70	<1	2.00	3.00	2.40
Lead	µg/L	10	<0.02	0.02	<0.02	<0.02	0.05	0.04	0.04	<0.02	<0.02	0.04	<0.02	0.03	0.06	<0.02	<0.02	<0.02	<0.1	<0.02
Mercury	µg/L	0.29	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Molybdenum	µg/L	70	1.90	2.30	2.10	2.20	1.90	1.90	2.00	1.40	2.20	1.80	1.20	3.60	1.60	1.20	1.70	4.20	2.10	2.50
Nickel	µg/L	100	0.70	0.50	0.40	0.30	0.30	0.30	0.30	0.30	0.30	1.40	1.90	1.30	1.60	1.30	1.60	2.70	1.60	0.50
Selenium	µg/L	10	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	2.00	4.00	4.00	4.00	4.00	4.00	
Silver	µg/L	2	<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	<0.1	<0.1	<0.1	
Sodium	µg/L	490000	85000	71400	59300	197000	51100	20000	187000	24400	2000	109000	10300	22500	23400	36700	36700	25300	89000	22000
Thallium	µg/L	2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Uranium	µg/L	20	1.01	1.22	1.51	1.50	0.55	0.35	0.53	0.55	1.15	2.02	4.27	0.50	0.63	0.64	0.64	1.05	1.65	1.13
Vanadium	µg/L	6	0.20	0.40	0.50	0.50	0.20	0.20	0.20	0.20	<0.1	<0.1	<0.1	0.50	0.40	0.50	0.40	0.20	<0.5	0.20
Zinc	µg/L	1100	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Inorganics																				
pH @25 °C	pH Units	NV	7.70	8.06	8.00	8.01	8.03	8.11	7.96	8.07	7.84	8.02	7.99	7.79	7.98	8	8.01	8.02	7.8	8
Conductivity @25°C	µmhos/cm	NV	1070	0.849	793	729	644	0.566	718	644	0.618	0.622	604	727	0.84	1040	0.849	934	2.22	783
Chloride	µg/L	790000	11000	49.2	--	--	20500	23	--	20700	18100	8.4	--	25400	22.8	--	23.1	23300	36.9	--
Fluoride (Free)	µg/L	66	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

1 Ontario Ministry of Environment, Conservation and Parks (MECP), Soil, Groundwater and Sediment Standards for use under Part XV.1 of the Environmental Protection Act, April 2011, Table 2 Generic Site Condition Standards in a Potable Ground Water Condition for all types of Property Use (coarse textured soils).
 * F1 fraction does not include BTEX.
 ** In instances where the PHC F2 to F4 chromatogram did not reach baseline, the F4 fraction result shown is the highest value obtained via the gas chromatograph/flame ionization detection method or the gravimetric method.
 ND Non-detectable results are shown as "<" (RDCL) where RDCL represents the reporting detection limit.
 N/A No Value
 - Not Applicable
 Parameter not analyzed
 Metres below ground surface
 m bgs Indicates groundwater exceedance of MECP Table 2 SC3

Table 4 - Relative Percent Differences -Metals in Groundwater
 4380 Trail Road Road, Ottawa, Ontario
 OTT-21023798-A0

Parameter	Units	RDL	MW-2 (P2)	MW-9 (Field Duplicate for MW-2)	RPD (%)	Alert Limit (%)
			1-Feb-2024	1-Feb-2024		
Metals						
Antimony	ug/L	0.1	< 0.1	< 0.1	nc	30
Arsenic	ug/L	0.1	0.1	0.1	nc	30
Barium	ug/L	1	95	97	2.1	30
Beryllium	ug/L	0.1	< 0.1	< 0.1	nc	30
Boron	ug/L	5	18	18	nc	30
Cadmium	ug/L	0.0150	0.0150	<0.015	nc	30
Chromium	ug/L	1.00	< 1	< 1	nc	30
Chromium (VI)	ug/L	10.00	< 10	< 10	nc	30
Cobalt	ug/L	0.10	0.20	0.10	1.5	30
Copper	ug/L	0.10	1.7	1.7	0.0	30
Lead	ug/L	0.02	< 0.02	< 0.02	nc	30
Mercury	ug/L	0.02	< 0.02	< 0.02	nc	30
Molybdenum	ug/L	1.20	2.1	2.2	21.5	30
Nickel	ug/L	0.20	0.4	0.4	0.0	30
Selenium	ug/L	1.00	< 1	< 1	nc	30
Silver	ug/L	0.10	< 0.1	< 0.1	nc	30
Sodium	ug/L	200.00	50300	51100	1.6	30
Thallium	ug/L	0.05	< 0.05	< 0.05	nc	30
Uranium	ug/L	0.05	1.51	1.5	0.7	30
Vanadium	ug/L	0.10	0.5	0.5	nc	30
Zinc	ug/L	5.00	< 5	< 5	nc	30

NOTES:

Analysis by Caduceon Laboratories Ltd.

All results on dry weight basis; Non-detectable results are shown as "ND (RDL)" where RDL represents the reporting detection limit.

- means "not analysed"

nc means "not calculable" - one (or both) of the results are <5x RDL

Exceedances of alert limits are shown in **bold**

Appendix E - Laboratory Certificates of Analysis

C.O.C.: G 111572

REPORT No: 24-003169 - Rev. 1

Report To:

EXP Services Inc - Ottawa
 2650 Queensview Drive
 Suite 100
 Ottawa, ON K2B 8H6

CADUCEON Environmental Laboratories

2378 Holly Lane
 Ottawa, ON K1V 7P1

Attention: Chris Kimmerly

DATE RECEIVED: 2024-Feb-02
 DATE REPORTED: 2024-Feb-23
 SAMPLE MATRIX: Ground Water

CUSTOMER PROJECT: OTT-21023795-AO
 P.O. NUMBER:

Analyses	Qty	Site Analyzed	Authorized	Date Analyzed	Lab Method	Reference Method
Cond/pH/Alk Auto (Liquid)	6	OTTAWA	SBOUDREAU	2024-Feb-02	COND-02/PH-02/A LK-02	SM 2510B/4500H/ 2320B
Cyanide WAD (Liquid)	6	KINGSTON	JMACINNES	2024-Feb-05	CN-001	SM 4500-CN-E
Chromium VI (Liquid)	6	OTTAWA	STAILLON	2024-Feb-05	D-CRVI-01	MECP E3056
ICP/MS (Liquid)	6	OTTAWA	TPRICE	2024-Feb-05	D-ICPMS-01	EPA 200.8
ICP/OES (Liquid)	6	OTTAWA	NHOGAN	2024-Feb-02	D-ICP-01	SM 3120B
Mercury (Liquid)	6	OTTAWA	TBENNETT	2024-Feb-05	D-HG-02	SM 3112B
PHC F1 (Liquid)	6	RICHMOND_HILL	FLENA	2024-Feb-06	C-VPHW-01	MECP E3421
PHC F2-4 (Liquid)	6	KINGSTON	STHOMPSON	2024-Feb-06	PHC-W-001	MECP E3421
SVOC - Semi-Volatiles (Liquid)	6	KINGSTON	EASIEDU	2024-Feb-06	NAB-W-001	EPA 8270D
VOC-Volatiles Full (Water)	8	RICHMOND_HILL	FLENA	2024-Feb-06	C-VOC-02	EPA 8260

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
 F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)
 F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
 F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

NC = Not Calculated

Test methods may be modified from specified reference method unless indicated by an *

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC QC will be made available upon request.

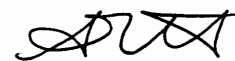


Steve Garrett
 Director of Laboratory Services

CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-003169 - Rev. 1

Parameter	Units	R.L.	Limits	Client I.D.	MW-5	MW-2	MW-9	MW-4	
					Sample I.D.	24-003169-1	24-003169-2	24-003169-3	24-003169-4
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
				Reg 153 - Liquid	-	-	-	-	
Conductivity @25°C	uS/cm	1			1040	735	729	674	
pH @25°C	pH units	-			7.78	8.00	8.01	7.79	
Cyanide (WAD)	µg/L	5.00	66	T2PGWFM	<5.00	<5.00	<5.00	<5.00	
Barium	µg/L	1.00	1000	T2PGWFM	260	95.0	97.0	498	
Boron	µg/L	5.00	5000	T2PGWFM	62.0	18.0	18.0	33.0	
Sodium	µg/L	200	490000	T2PGWFM	35200	50300	51100	10200	
Zinc	µg/L	5.00	1100	T2PGWFM	<5.00	<5.00	<5.00	<5.00	
Antimony	µg/L	0.1	6	T2PGWFM	<0.1	<0.1	<0.1	<0.1	
Arsenic	µg/L	0.1	25	T2PGWFM	0.2	0.1	0.1	<0.1	
Beryllium	µg/L	0.1	4	T2PGWFM	<0.1	<0.1	<0.1	<0.1	
Cadmium	µg/L	0.015	2.7	T2PGWFM	<0.015	0.015	<0.015	0.022	
Chromium	µg/L	1	50	T2PGWFM	<1	<1	<1	<1	
Cobalt	µg/L	0.1	3.8	T2PGWFM	0.3	0.2	0.1	0.7	
Copper	µg/L	0.1	87	T2PGWFM	2.7	1.7	1.7	1.8	
Lead	µg/L	0.02	10	T2PGWFM	<0.02	<0.02	<0.02	<0.02	
Molybdenum	µg/L	0.1	70	T2PGWFM	1.2	2.1	2.2	1.2	
Nickel	µg/L	0.2	100	T2PGWFM	1.3	0.4	0.4	1.3	
Selenium	µg/L	1	10	T2PGWFM	6	<1	<1	<1	
Silver	µg/L	0.1	1.5	T2PGWFM	<0.1	<0.1	<0.1	<0.1	
Thallium	µg/L	0.05	2	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Uranium	µg/L	0.05	20	T2PGWFM	0.64	1.51	1.50	4.27	



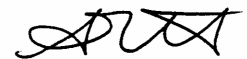
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Parameter	Units	R.L.	Limits	Client I.D.	MW-5	MW-2	MW-9	MW-4	
					Sample I.D.	24-003169-1	24-003169-2	24-003169-3	24-003169-4
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
					Reg 153 - Liquid	-	-	-	-
Vanadium	µg/L	0.100	6.2	T2PGWFM	0.500	0.500	0.500	<0.100	
Chromium (VI)	µg/L	10.0	25	T2PGWFM	<10.0	<10.0	<10.0	<10.0	
Mercury	µg/L	0.02	1	T2PGWFM	<0.02	<0.02	<0.02	<0.02	



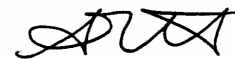
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Parameter	Units	R.L.	Limits	Client I.D.	MW-6	MW-3	
					Sample I.D.	24-003169-5	24-003169-6
					Date Collected	2024-Feb-01	2024-Feb-01
					Reg 153 - Liquid	-	-
Conductivity @25°C	uS/cm	1			783	728	
pH @25°C	pH units	-			8.00	7.96	
Cyanide (WAD)	µg/L	5.00	66	T2PGWFM	<5.00	<5.00	
Barium	µg/L	1.00	1000	T2PGWFM	174	339	
Boron	µg/L	5.00	5000	T2PGWFM	107	183	
Sodium	µg/L	200	490000	T2PGWFM	22000	24400	
Zinc	µg/L	5.00	1100	T2PGWFM	<5.00	<5.00	
Antimony	µg/L	0.1	6	T2PGWFM	<0.1	<0.1	
Arsenic	µg/L	0.1	25	T2PGWFM	0.1	<0.1	
Beryllium	µg/L	0.1	4	T2PGWFM	<0.1	<0.1	
Cadmium	µg/L	0.015	2.7	T2PGWFM	<0.015	<0.015	
Chromium	µg/L	1	50	T2PGWFM	<1	<1	
Cobalt	µg/L	0.1	3.8	T2PGWFM	0.2	0.2	
Copper	µg/L	0.1	87	T2PGWFM	2.4	2.8	
Lead	µg/L	0.02	10	T2PGWFM	<0.02	0.04	
Molybdenum	µg/L	0.1	70	T2PGWFM	2.5	2.0	
Nickel	µg/L	0.2	100	T2PGWFM	0.5	0.4	
Selenium	µg/L	1	10	T2PGWFM	3	<1	
Silver	µg/L	0.1	1.5	T2PGWFM	<0.1	<0.1	
Thallium	µg/L	0.05	2	T2PGWFM	<0.05	<0.05	
Uranium	µg/L	0.05	20	T2PGWFM	1.13	0.53	



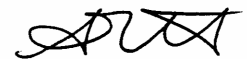
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Parameter	Units	R.L.	Limits	Client I.D.	MW-6	MW-3
					Sample I.D.	Sample I.D.
				Date Collected	24-003169-5	24-003169-6
				Reg 153 - Liquid	2024-Feb-01	2024-Feb-01
Vanadium	µg/L	0.100	6.2	T2PGWFM	0.200	0.200
Chromium (VI)	µg/L	10.0	25	T2PGWFM	<10.0	<10.0
Mercury	µg/L	0.02	1	T2PGWFM	<0.02	<0.02



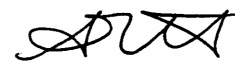
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Parameter	Units	R.L.	Limits	Client I.D. Sample I.D. Date Collected Reg 153 - Liquid	MW-5	MW-2	MW-9	MW-4
					24-003169-1	24-003169-2	24-003169-3	24-003169-4
					2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
					-	-	-	-
Acetone	µg/L	30	2700	T2PGWFM	<30	<30	<30	<30
Benzene	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	µg/L	2	16	T2PGWFM	<2	<2	<2	<2
Bromoform	µg/L	5	25	T2PGWFM	<5	<5	<5	<5
Bromomethane	µg/L	0.5	0.89	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Carbon Tetrachloride	µg/L	0.2	5	T2PGWFM	<0.2	<0.2	<0.2	<0.2
Chlorobenzene	µg/L	0.5	30	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Chloroform	µg/L	1	22	T2PGWFM	<1	<1	<1	<1
Dibromochloromethane	µg/L	2	25	T2PGWFM	<2	<2	<2	<2
Ethylene Dibromide	µg/L	0.2	0.2	T2PGWFM	<0.2	<0.2	<0.2	<0.2
Dichlorobenzene,1,2-	µg/L	0.5	3	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,3-	µg/L	0.5	59	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichlorobenzene,1,4-	µg/L	0.5	1	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane (Freon 12)	µg/L	2	590	T2PGWFM	<2	<2	<2	<2
Dichloroethane,1,1-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloroethane,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,1-	µg/L	0.5	14	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-cis-	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloroethylene,1,2-trans-	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloropropane,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloropropene,1,3-cis-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5



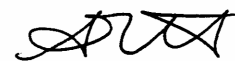
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					Sample I.D.	24-003169-1	24-003169-2	24-003169-3	24-003169-4
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
					Reg 153 - Liquid	-	-	-	-
Dichloropropene, 1,3-cis+trans- (Calculated)	µg/L	0.5	0.5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloropropene, 1,3-trans-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	
Ethylbenzene	µg/L	0.5	2.4	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Hexane	µg/L	5	520	T2PGWFM	<5	<5	<5	<5	
Dichloromethane (Methylene Chloride)	µg/L	5	50	T2PGWFM	<5	<5	<5	<5	
Methyl Ethyl Ketone	µg/L	20	1800	T2PGWFM	<20	<20	<20	<20	
Methyl Isobutyl Ketone	µg/L	20	640	T2PGWFM	<20	<20	<20	<20	
Methyl tert-Butyl Ether (MTBE)	µg/L	2	15	T2PGWFM	<2	<2	<2	<2	
Styrene	µg/L	0.5	5.4	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	1.1	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	1	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Tetrachloroethylene	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Toluene	µg/L	0.5	24	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Trichloroethane, 1,1,1-	µg/L	0.5	200	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Trichloroethane, 1,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Trichloroethylene	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Trichlorofluoromethane (Freon 11)	µg/L	5	150	T2PGWFM	<5	<5	<5	<5	
Vinyl Chloride	µg/L	0.2	1.7	T2PGWFM	<0.2	<0.2	<0.2	<0.2	
Xylene, m,p-	µg/L	1			<1	<1	<1	<1	
Xylene, m,p,o-	µg/L	1.1	300	T2PGWFM	<1.1	<1.1	<1.1	<1.1	
Xylene, o-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	



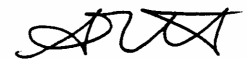
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Parameter	Units	R.L.	Limits	Client I.D.	MW-5	MW-2	MW-9	MW-4	
					Sample I.D.	24-003169-1	24-003169-2	24-003169-3	24-003169-4
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
					Reg 153 - Liquid	-	-	-	-
PHC F1 (C6-C10)	µg/L	25	750	T2PGWFM	<25	<25	<25	<25	
PHC F2 (>C10-C16)	µg/L	50	150	T2PGWFM	<50	<50	<50	<50	
PHC F3 (>C16-C34)	µg/L	400	500	T2PGWFM	<400	<400	<400	<400	
PHC F4 (>C34-C50)	µg/L	400	500	T2PGWFM	<400	<400	<400	<400	



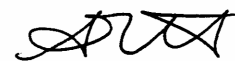
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Parameter	Units	R.L.	Limits	Client I.D.	MW-6	MW-3	Field Blank	Trip Blank	
					Sample I.D.	24-003169-5	24-003169-6	24-003169-7	24-003169-8
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
					Reg 153 - Liquid	-	-	-	-
Acetone	µg/L	30	2700	T2PGWFM	<30	<30	<30	<30	
Benzene	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane	µg/L	2	16	T2PGWFM	<2	<2	<2	<2	
Bromoform	µg/L	5	25	T2PGWFM	<5	<5	<5	<5	
Bromomethane	µg/L	0.5	0.89	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Carbon Tetrachloride	µg/L	0.2	5	T2PGWFM	<0.2	<0.2	<0.2	<0.2	
Chlorobenzene	µg/L	0.5	30	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Chloroform	µg/L	1	22	T2PGWFM	<1	<1	6	9	
Dibromochloromethane	µg/L	2	25	T2PGWFM	<2	<2	<2	<2	
Ethylene Dibromide	µg/L	0.2	0.2	T2PGWFM	<0.2	<0.2	<0.2	<0.2	
Dichlorobenzene,1,2-	µg/L	0.5	3	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichlorobenzene,1,3-	µg/L	0.5	59	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichlorobenzene,1,4-	µg/L	0.5	1	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichlorodifluoromethane (Freon 12)	µg/L	2	590	T2PGWFM	<2	<2	<2	<2	
Dichloroethane,1,1-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloroethane,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloroethylene,1,1-	µg/L	0.5	14	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloroethylene,1,2-cis-	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloroethylene,1,2-trans-	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloropropane,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5	
Dichloropropene,1,3-cis-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5	



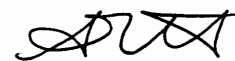
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					Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
					Date Collected	Date Collected	Date Collected	Date Collected
				Reg 153 - Liquid	-	-	-	-
Dichloropropene, 1,3-cis+trans- (Calculated)	µg/L	0.5	0.5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Dichloropropene, 1,3-trans-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	0.5	2.4	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Hexane	µg/L	5	520	T2PGWFM	<5	<5	<5	<5
Dichloromethane (Methylene Chloride)	µg/L	5	50	T2PGWFM	<5	<5	<5	<5
Methyl Ethyl Ketone	µg/L	20	1800	T2PGWFM	<20	<20	<20	<20
Methyl Isobutyl Ketone	µg/L	20	640	T2PGWFM	<20	<20	<20	<20
Methyl tert-Butyl Ether (MTBE)	µg/L	2	15	T2PGWFM	<2	<2	<2	<2
Styrene	µg/L	0.5	5.4	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	1.1	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	1	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Tetrachloroethylene	µg/L	0.5	17	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Toluene	µg/L	0.5	24	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,1-	µg/L	0.5	200	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Trichloroethane, 1,1,2-	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	µg/L	0.5	5	T2PGWFM	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	µg/L	5	150	T2PGWFM	<5	<5	<5	<5
Vinyl Chloride	µg/L	0.2	1.7	T2PGWFM	<0.2	<0.2	<0.2	<0.2
Xylene, m,p-	µg/L	1			<1	<1	<1	<1
Xylene, m,p,o-	µg/L	1.1	300	T2PGWFM	<1.1	<1.1	<1.1	<1.1
Xylene, o-	µg/L	0.5			<0.5	<0.5	<0.5	<0.5



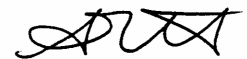
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Parameter	Units	R.L.	Limits	Client I.D.	MW-6	MW-3	Field Blank	Trip Blank
					Sample I.D.	Sample I.D.	Sample I.D.	Sample I.D.
Date Collected					24-003169-5	24-003169-6	24-003169-7	24-003169-8
Reg 153 - Liquid					2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
PHC F1 (C6-C10)	µg/L	25	750	T2PGWFM	<25	<25		
PHC F2 (>C10-C16)	µg/L	50	150	T2PGWFM	<50	<50		
PHC F3 (>C16-C34)	µg/L	400	500	T2PGWFM	<400	<400		
PHC F4 (>C34-C50)	µg/L	400	500	T2PGWFM	<400	<400		



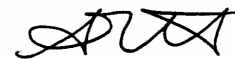
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Parameter	Units	R.L.	Limits	Client I.D.	MW-5	MW-2	MW-9	MW-4	
					Sample I.D.	24-003169-1	24-003169-2	24-003169-3	24-003169-4
					Date Collected	2024-Feb-01	2024-Feb-01	2024-Feb-01	2024-Feb-01
				Reg 153 - Liquid	-	-	-	-	
Acenaphthene	µg/L	0.05	4.1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Acenaphthylene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Anthracene	µg/L	0.05	2.4	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Benzo[a]anthracene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Benzo(a)pyrene	µg/L	0.01	0.01	T2PGWFM	<0.01	<0.01	<0.01	<0.01	
Benzo(b)fluoranthene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Benzo(b+k)fluoranthene	µg/L	0.1			<0.1	<0.1	<0.1	<0.1	
Benzo(g,h,i)perylene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Benzo(k)fluoranthene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Chrysene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Dibenzo(a,h)anthracene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Fluoranthene	µg/L	0.05	0.41	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Fluorene	µg/L	0.05	120	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Indeno(1,2,3,-cd)Pyrene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Methylnaphthalene,1-	µg/L	0.05			<0.05	<0.05	<0.05	<0.05	
Methylnaphthalene,2-(1-)	µg/L	1	3.2	T2PGWFM	<1	<1	<1	<1	
Methylnaphthalene,2-	µg/L	0.05			<0.05	<0.05	<0.05	<0.05	
Naphthalene	µg/L	0.05	11	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Phenanthrene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	
Pyrene	µg/L	0.05	4.1	T2PGWFM	<0.05	<0.05	<0.05	<0.05	



Steve Garrett
 Director of Laboratory Services

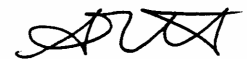
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CADUCEON Environmental Laboratories Certificate of Analysis

Final Report
REPORT No: 24-003169 - Rev. 1

Parameter	Units	R.L.	Limits	Client I.D.	MW-6	MW-3
					24-003169-5	24-003169-6
					2024-Feb-01	2024-Feb-01
					Sample I.D.	Date Collected
				Reg 153 - Liquid	-	-
Acenaphthene	µg/L	0.05	4.1	T2PGWFM	<0.05	<0.05
Acenaphthylene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05
Anthracene	µg/L	0.05	2.4	T2PGWFM	<0.05	<0.05
Benzo[a]anthracene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05
Benzo(a)pyrene	µg/L	0.01	0.01	T2PGWFM	<0.01	<0.01
Benzo(b)fluoranthene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05
Benzo(b+k)fluoranthene	µg/L	0.1			<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05
Benzo(k)fluoranthene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05
Chrysene	µg/L	0.05	0.1	T2PGWFM	<0.05	<0.05
Dibenzo(a,h)anthracene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05
Fluoranthene	µg/L	0.05	0.41	T2PGWFM	<0.05	<0.05
Fluorene	µg/L	0.05	120	T2PGWFM	<0.05	<0.05
Indeno(1,2,3,-cd)Pyrene	µg/L	0.05	0.2	T2PGWFM	<0.05	<0.05
Methylnaphthalene,1-	µg/L	0.05			<0.05	<0.05
Methylnaphthalene,2-(1-)	µg/L	1	3.2	T2PGWFM	<1	<1
Methylnaphthalene,2-	µg/L	0.05			<0.05	<0.05
Naphthalene	µg/L	0.05	11	T2PGWFM	<0.05	<0.05
Phenanthrene	µg/L	0.05	1	T2PGWFM	<0.05	<0.05
Pyrene	µg/L	0.05	4.1	T2PGWFM	<0.05	<0.05

Reg 153 - Liquid: Reg 153 - Liquid
T2PGWFM: R153 Tbl. 2 - PGW (fine/Med)



Steve Garrett
Director of Laboratory Services

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C.O.C.: G110810

REPORT No. B22-17759

Report To:

EXP Services Inc

2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1
 Tel: 613-526-0123
 Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

SAMPLE MATRIX: Groundwater

P.O. NUMBER:

WATERWORKS NO.

Parameter	Qty	Site Analyzed	Analyst Initials	Date Analyzed	Lab Method	Reference Method
Cyanide	6	Kingston	kwe	15-Jun-22	A-CN-001 (k)	SM 4500CN
Conductivity	6	Holly Lane	SYL	13-Jun-22	A-COND-02 (o)	SM 2510B
Anions	6	Holly Lane	VK	14-Jun-22	A-IC-01 (o)	SM4110C
pH	6	Holly Lane	SYL	13-Jun-22	A-PH-01 (o)	SM 4500H
SVOC	6	Kingston	esi	14-Jun-22	C-NAB-S-001 (k)	EPA 8270
SVOC	6	Kingston	esi	14-Jun-22	C-NAB-W-001 (k)	EPA 8270
PHC(F2-F4)	6	Kingston	KPR	13-Jun-22	C-PHC-W-001 (k)	MOE E3421
VOC's	7	Richmond Hill	FAL	13-Jun-22	C-VOC-02 (rh)	EPA 8260
PHC(F1)	6	Richmond Hill	FAL	13-Jun-22	C-VPHW-01 (rh)	MOE E3421
Chromium (VI)	6	Holly Lane	ST	15-Jun-22	D-CRVI-01 (o)	MOE E3056
Mercury	6	Holly Lane	PBK	15-Jun-22	D-HG-02 (o)	SM 3112 B
Metals - ICP-OES	6	Holly Lane	AHM	14-Jun-22	D-ICP-01 (o)	SM 3120
Metals - ICP-MS	6	Holly Lane	TPR	16-Jun-22	D-ICPMS-01 (o)	EPA 200.8

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg

F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)

F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)

F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)

F4 C34-C50 hydrocarbons in µg/g

This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.

If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC

QC will be made available upon request.

O. Reg. 153 - Soil, Ground Water and Sediment Standards

Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
 Lab Manager - Ottawa District

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		P2 B22-17759-1 09-Jun-22	MW-3 B22-17759-2 09-Jun-22	MW-4 B22-17759-3 09-Jun-22	MW-5 B22-17759-4 09-Jun-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.						
pH @25°C	pH Units		7.70	8.03	7.84	7.98		
Conductivity @25°C	µmho/cm	1	1070	646	618	722		
Chloride	µg/L	500	51000	20500	18100	25400	790000	
Cyanide (Free)	µg/L	5	< 5	< 5	< 5	< 5	5	
Antimony	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.5	
Arsenic	µg/L	0.1	0.1	< 0.1	0.2	0.2	13	
Barium	µg/L	1	106	259	361	178	610	
Beryllium	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5	
Boron	µg/L	5	22	59	34	39	1700	
Cadmium	µg/L	0.015	< 0.015	< 0.015	0.022	< 0.015	0.5	
Chromium	µg/L	2	< 2	< 2	< 2	< 2	11	
Chromium (VI)	µg/L	10	< 10	< 10	< 10	< 10	25	
Cobalt	µg/L	0.1	< 0.1	< 0.1	1.4	0.9	3.8	
Copper	µg/L	2	< 2	< 2	< 2	2	5	
Lead	µg/L	0.02	< 0.02	< 0.02	< 0.02	0.03	1.9	
Mercury	µg/L	0.02	< 0.02	< 0.02	< 0.02	< 0.02	0.1	
Molybdenum	µg/L	0.1	1.9	1.5	3.2	3.6	23	
Nickel	µg/L	0.2	0.7	0.3	2.0	1.9	14	
Selenium	µg/L	1	< 1	< 1	< 1	2	5	
Silver	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3	
Sodium	µg/L	200	85000	20000	10900	22500	490000	
Thallium	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.5	
Uranium	µg/L	0.05	1.01	0.56	4.18	0.60	8.9	
Vanadium	µg/L	0.1	0.2	0.2	< 0.1	0.5	3.9	
Zinc	µg/L	5	< 5	< 5	< 5	< 5	160	
Acetone	µg/L	30	< 30	< 30	< 30	< 30	2700	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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Lab Manager - Ottawa District

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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		P2 B22-17759-1 09-Jun-22	MW-3 B22-17759-2 09-Jun-22	MW-4 B22-17759-3 09-Jun-22	MW-5 B22-17759-4 09-Jun-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.						
Benzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	< 2	2	
Bromoform	µg/L	5	< 5	< 5	< 5	< 5	5	
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Chloroform	µg/L	1	< 1	< 1	< 1	< 1	2	
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	< 2	2	
Dichlorobenzene, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	< 2	590	
Dichloroethane, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethylene, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloropropane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene 1,3- cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.2	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G110810

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 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1

Tel: 613-526-0123

Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		P2 B22-17759-1 09-Jun-22	MW-3 B22-17759-2 09-Jun-22	MW-4 B22-17759-3 09-Jun-22	MW-5 B22-17759-4 09-Jun-22	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.						
Hexane	µg/L	5	< 5	< 5	< 5	< 5	5	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	400	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	< 20	640	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	< 5	5	
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Toluene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	
Trichloroethane, 1,1,1,-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethane, 1,1,2,-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	< 5	150	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5		
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	< 1.1	72	
Dibromofluoromethane (SS)	% rec.		91.5	104	94.0	95.8		
Toluene-d8 (SS)	% rec.		93.0	95.3	95.4	94.8		
Bromofluorobenzene,4(SS)	% rec.		100	99.1	98.5	98.6		
PHC F1 (C6-C10)	µg/L	25	< 25	< 25	< 25	< 25	420	
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50	< 50	< 50	150	
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400	< 400	< 400	500	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



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 Lab Manager - Ottawa District

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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D.		P2	MW-3	MW-4	MW-5	O. Reg. 153	
	Sample I.D.	Date Collected	B22-17759-1 09-Jun-22	B22-17759-2 09-Jun-22	B22-17759-3 09-Jun-22	B22-17759-4 09-Jun-22	Tbl. 1 - GW (µg/L)	
	Units	R.L.						
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400	< 400	< 400	500	
Acenaphthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	4.1	
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	1	
Anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	
Benzo(a)anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	
Benzo(a)pyrene	µg/L	0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01	
Benzo(b)fluoranthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1		
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	
Benzo(k)fluoranthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	
Chrysene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	
Fluoranthene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.4	
Fluorene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	120	
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	
Methylnaphthalene,1-	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	2	
Methylnaphthalene,2-	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	2	
Methylnaphthalene 2-(1-)	µg/L	1	< 1	< 1	< 1	< 1	2	
Naphthalene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	7	
Phenanthrene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	
Pyrene	µg/L	0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.2	
Terphenyl-d14 (SS)	% rec.	10	84.0	83.0	88.0	89.0		

1 Chromium (VI) result is based on total chromium

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
 Lab Manager - Ottawa District

R.L. = Reporting Limit

Test methods may be modified from specified reference method unless indicated by an *

Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G110810

REPORT No. B22-17759

Report To:

EXP Services Inc

2650 Queensview Drive, Suite 100
Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.	MW-6	DUP 1	Trip Blank	O. Reg. 153	
			Sample I.D.	B22-17759-5	B22-17759-6	B22-17759-7	Tbl. 1 - GW (µg/L)	
			Date Collected	09-Jun-22	09-Jun-22			
pH @25°C	pH Units			8.02	8.07			
Conductivity @25°C	µmho/cm	1		934	644			
Chloride	µg/L	500		23300	20700		790000	
Cyanide (Free)	µg/L	5		< 5	< 5		5	
Antimony	µg/L	0.1		0.1	< 0.1		1.5	
Arsenic	µg/L	0.1		0.1	< 0.1		13	
Barium	µg/L	1		137	257		610	
Beryllium	µg/L	0.1		< 0.1	< 0.1		0.5	
Boron	µg/L	5		105	57		1700	
Cadmium	µg/L	0.015		< 0.015	< 0.015		0.5	
Chromium	µg/L	2		< 2	< 2		11	
Chromium (VI)	µg/L	10		< 10	< 10		25	
Cobalt	µg/L	0.1		0.7	< 0.1		3.8	
Copper	µg/L	2		2	< 2		5	
Lead	µg/L	0.02		0.02	< 0.02		1.9	
Mercury	µg/L	0.02		< 0.02	< 0.02		0.1	
Molybdenum	µg/L	0.1		4.2	1.4		23	
Nickel	µg/L	0.2		1.6	0.3		14	
Selenium	µg/L	1		4	< 1		5	
Silver	µg/L	0.1		< 0.1	< 0.1		0.3	
Sodium	µg/L	200		25300	20000		490000	
Thallium	µg/L	0.05		< 0.05	< 0.05		0.5	
Uranium	µg/L	0.05		1.09	0.56		8.9	
Vanadium	µg/L	0.1		0.2	0.2		3.9	
Zinc	µg/L	5		< 5	< 5		160	
Acetone	µg/L	30		< 30	< 30	< 30	2700	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit

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Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		MW-6 B22-17759-5 09-Jun-22	DUP 1 B22-17759-6 09-Jun-22	Trip Blank B22-17759-7	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Benzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Bromodichloromethane	µg/L	2	< 2	< 2	< 2	2	
Bromoform	µg/L	5	< 5	< 5	< 5	5	
Bromomethane	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.89	
Carbon Tetrachloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.2	
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Chloroform	µg/L	1	< 1	< 1	< 1	2	
Dibromochloromethane	µg/L	2	< 2	< 2	< 2	2	
Dichlorobenzene, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorobenzene, 1,4-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichlorodifluoromethane	µg/L	2	< 2	< 2	< 2	590	
Dichloroethane, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethylene, 1,1-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloroethene, cis-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloroethene, trans-1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.6	
Dichloropropane, 1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dichloropropene, cis-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene, trans-1,3-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Dichloropropene 1,3- cis+trans	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Ethylbenzene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.2	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
Lab Manager - Ottawa District

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REPORT No. B22-17759

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2378 Holly Lane
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 Tel: 613-526-0123
 Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		MW-6 B22-17759-5 09-Jun-22	DUP 1 B22-17759-6 09-Jun-22	Trip Blank B22-17759-7	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
Hexane	µg/L	5	< 5	< 5	< 5	5	
Methyl Ethyl Ketone	µg/L	20	< 20	< 20	< 20	400	
Methyl Isobutyl Ketone	µg/L	20	< 20	< 20	< 20	640	
Methyl-t-butyl Ether	µg/L	2	< 2	< 2	< 2	15	
Dichloromethane (Methylene Chloride)	µg/L	5	< 5	< 5	< 5	5	
Styrene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	1.1	
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Tetrachloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Toluene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.8	
Trichloroethane, 1,1,1,-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethane, 1,1,2,-	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5	< 0.5	0.5	
Trichlorofluoromethane	µg/L	5	< 5	< 5	< 5	150	
Vinyl Chloride	µg/L	0.2	< 0.2	< 0.2	< 0.2	0.5	
Xylene, m,p-	µg/L	1.0	< 1.0	< 1.0	< 1.0		
Xylene, o-	µg/L	0.5	< 0.5	< 0.5	< 0.5		
Xylene, m,p,o-	µg/L	1.1	< 1.1	< 1.1	< 1.1	72	
Dibromofluoromethane (SS)	% rec.		93.9	95.9	105		
Toluene-d8 (SS)	% rec.		95.7	101	96.3		
Bromofluorobenzene,4(SS)	% rec.		98.5	103	101		
PHC F1 (C6-C10)	µg/L	25	< 25	< 25		420	
PHC F2 (>C10-C16)	µg/L	50	< 50	< 50		150	
PHC F3 (>C16-C34)	µg/L	400	< 400	< 400		500	

O. Reg. 153 - Soil, Ground Water and Sediment Standards
 Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
 Lab Manager - Ottawa District

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G110810

REPORT No. B22-17759

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Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Client I.D. Sample I.D. Date Collected		MW-6 B22-17759-5 09-Jun-22	DUP 1 B22-17759-6 09-Jun-22	Trip Blank B22-17759-7	O. Reg. 153 Tbl. 1 - GW (µg/L)	
	Units	R.L.					
PHC F4 (>C34-C50)	µg/L	400	< 400	< 400		500	
Acenaphthene	µg/L	0.05	< 0.05	< 0.05		4.1	
Acenaphthylene	µg/L	0.05	< 0.05	< 0.05		1	
Anthracene	µg/L	0.05	< 0.05	< 0.05		0.1	
Benzo(a)anthracene	µg/L	0.05	< 0.05	< 0.05		0.2	
Benzo(a)pyrene	µg/L	0.01	< 0.01	< 0.01		0.01	
Benzo(b)fluoranthene	µg/L	0.05	< 0.05	< 0.05		0.1	
Benzo(b+k)fluoranthene	µg/L	0.1	< 0.1	< 0.1			
Benzo(g,h,i)perylene	µg/L	0.05	< 0.05	< 0.05		0.2	
Benzo(k)fluoranthene	µg/L	0.05	< 0.05	< 0.05		0.1	
Chrysene	µg/L	0.05	< 0.05	< 0.05		0.1	
Dibenzo(a,h)anthracene	µg/L	0.05	< 0.05	< 0.05		0.2	
Fluoranthene	µg/L	0.05	< 0.05	< 0.05		0.4	
Fluorene	µg/L	0.05	< 0.05	< 0.05		120	
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	< 0.05	< 0.05		0.2	
Methylnaphthalene,1-	µg/L	0.05	< 0.05	< 0.05		2	
Methylnaphthalene,2-	µg/L	0.05	< 0.05	< 0.05		2	
Methylnaphthalene 2-(1-)	µg/L	1	< 1	< 1		2	
Naphthalene	µg/L	0.05	< 0.05	< 0.05		7	
Phenanthrene	µg/L	0.05	< 0.05	< 0.05		0.1	
Pyrene	µg/L	0.05	< 0.05	< 0.05		0.2	
Terphenyl-d14 (SS)	% rec.	10	78.0	90.0			

1 Chromium (VI) result is based on total chromium

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW (µg/L) - Table 1 - Ground Water



Greg Clarkin, BSc., C. Chem
Lab Manager - Ottawa District

R.L. = Reporting Limit

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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

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C.O.C.: G110810

REPORT No. B22-17759

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Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
Ottawa Ontario K1V 7P1
Tel: 613-526-0123
Fax: 613-526-1244

DATE RECEIVED: 09-Jun-22

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-Jun-22

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Summary of Exceedances

O. Reg. 153 - Soil, Ground Water and Sediment Standards
Tbl. 1 - GW ($\mu\text{g/L}$) - Table 1 - Ground Water



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Site Analyzed=K-Kingston,W-Windsor,O-Ottawa,R-Richmond Hill,B-Barrie

Greg Clarkin, BSc., C. Chem
Lab Manager - Ottawa District

C.O.C.: G107095

REPORT No. B23-03303 (i)

Report To:

EXP Services Inc
 2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1
 Tel: 613-526-0123
 Fax: 613-526-1244

DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6
					Sample I.D.	B23-03303-1	B23-03303-2	B23-03303-3	B23-03303-4
					Date Collected	05-May-23	05-May-23	05-May-23	05-May-23
pH @25°C	pH Units		SM 4500H	10-May-23/O	8.00	7.99	8.06	7.80	
Conductivity @25°C	mS/cm	0.001	SM 2510B	10-May-23/O	0.84	0.622	0.849	2.22	
Chloride	mg/L	0.5	SM4110C	09-May-23/O	22.8	8.4	49.2	36.9	
Nitrate (N)	mg/L	0.1	SM4110C	09-May-23/O	0.9	1.8	0.2	36.3	
Nitrite (N)	mg/L	0.1	SM4110C	09-May-23/O	< 0.1	< 0.1	< 0.1	< 1	
Cyanide (Free)	µg/L	5	SM 4500CN	16-May-23/K	< 5	< 5	< 5	< 5	
Sodium	µg/L	200	SM 3120	10-May-23/O	23400	10300	71400	88000	
Antimony	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1	< 0.1	< 0.5	
Arsenic	µg/L	0.1	EPA 200.8	12-May-23/O	0.1	< 0.1	0.1	< 0.5	
Barium	µg/L	1	SM 3120	10-May-23/O	189	272	59	55	
Beryllium	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1	< 0.1	< 0.5	
Boron	µg/L	5	SM 3120	10-May-23/O	51	74	24	660	
Cadmium	µg/L	0.015	EPA 200.8	12-May-23/O	< 0.015	< 0.015	< 0.015	< 0.070	
Chromium	µg/L	2	SM 3120	10-May-23/O	< 2	< 2	< 2	< 2	
Chromium (VI)	µg/L	10	MOE E3056	10-May-23/O	< 10 ¹	< 10 ¹	< 10 ¹	< 10 ¹	
Cobalt	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	0.2	< 0.1	< 0.5	
Copper	µg/L	2	SM 3120	10-May-23/O	2	2	< 2	5	



Steve Garrett
 Director of Laboratory Services

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Uncertainty values available upon request

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C.O.C.: G107095

REPORT No. B23-03303 (ii)

Report To:

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 2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1
 Tel: 613-526-0123
 Fax: 613-526-1244

DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		MW-5	MW-4	P-2	MW-6
			Sample I.D.	Date Collected	B23-03303-1	B23-03303-2	B23-03303-3	B23-03303-4
			Reference Method	Date/Site Analyzed	05-May-23	05-May-23	05-May-23	05-May-23
PHC F1 (C6-C10)	µg/L	25	MOE E3421	09-May-23/R	< 25	< 25	< 25	< 25
PHC F2 (>C10-C16)	µg/L	50	MOE E3421	09-May-23/K	< 50	< 50	< 50	< 50
PHC F3 (>C16-C34)	µg/L	400	MOE E3421	09-May-23/K	< 400	< 400	< 400	< 400
PHC F4 (>C34-C50)	µg/L	400	MOE E3421	09-May-23/K	< 400	< 400	< 400	< 400
Acetone	µg/L	30	EPA 8260	09-May-23/R	< 30	< 30	< 30	< 30
Benzene	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	2	EPA 8260	09-May-23/R	< 2	< 2	< 2	< 2
Bromoform	µg/L	5	EPA 8260	09-May-23/R	< 5	< 5	< 5	< 5
Bromomethane	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	EPA 8260	09-May-23/R	< 0.2	< 0.2	< 0.2	< 0.2
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	µg/L	1	EPA 8260	09-May-23/R	< 1	< 1	< 1	< 1
Dibromochloromethane	µg/L	2	EPA 8260	09-May-23/R	< 2	< 2	< 2	< 2
Dichlorobenzene,1,2-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,3-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5



Steve Garrett

Director of Laboratory Services

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Uncertainty values available upon request

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C.O.C.: G107095

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DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6
					Sample I.D.	Date Collected			
Dichlorodifluoromethane	µg/L	2	EPA 8260	09-May-23/R	B23-03303-1	05-May-23	B23-03303-2	B23-03303-3	B23-03303-4
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene 1,3-cis+trans	µg/L	0.5	EPA 8260	09-May-23/R					
Ethylbenzene	µg/L	0.5	EPA 8260	09-May-23/R					
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	09-May-23/R					
Hexane	µg/L	5	EPA 8260	09-May-23/R					
Methyl Ethyl Ketone	µg/L	20	EPA 8260	09-May-23/R					
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	09-May-23/R					



Steve Garrett
 Director of Laboratory Services

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Uncertainty values available upon request

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C.O.C.: G107095

REPORT No. B23-03303 (ii)

Report To:

EXP Services Inc

2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1

Tel: 613-526-0123

Fax: 613-526-1244

DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6
					Sample I.D.	Date Collected			
Methyl-t-butyl Ether	µg/L	2	EPA 8260	09-May-23/R	B23-03303-1	05-May-23	< 2	< 2	< 2
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	09-May-23/R	B23-03303-2	05-May-23	< 5	< 5	< 5
Styrene	µg/L	0.5	EPA 8260	09-May-23/R	B23-03303-3	05-May-23	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	EPA 8260	09-May-23/R	B23-03303-4	05-May-23	< 0.5	< 0.5	< 0.5
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Tetrachloroethylene	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Toluene	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	µg/L	5	EPA 8260	09-May-23/R			< 5	< 5	< 5
Vinyl Chloride	µg/L	0.2	EPA 8260	09-May-23/R			< 0.2	< 0.2	< 0.2
Xylene, m,p-	µg/L	1.0	EPA 8260	09-May-23/R			< 1.0	< 1.0	< 1.0
Xylene, o-	µg/L	0.5	EPA 8260	09-May-23/R			< 0.5	< 0.5	< 0.5
Xylene, m,p,o-	µg/L	1.1	EPA 8260	09-May-23/R			< 1.1	< 1.1	< 1.1



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C.O.C.: G107095

REPORT No. B23-03303 (ii)

Report To:

EXP Services Inc

2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1
 Tel: 613-526-0123
 Fax: 613-526-1244

DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	MW-5	MW-4	P-2	MW-6
Sample I.D.	B23-03303-1	B23-03303-2	B23-03303-3	B23-03303-4
Date Collected	05-May-23	05-May-23	05-May-23	05-May-23

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed
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Steve Garrett

Director of Laboratory Services

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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Client I.D.		MW-3	P-3	Trip Blank	Field Blank
			Sample I.D.	Date Collected	B23-03303-5	B23-03303-6	B23-03303-7	B23-03303-8
			Reference Method	Date/Site Analyzed	05-May-23	05-May-23	05-May-23	05-May-23
PHC F1 (C6-C10)	µg/L	25	MOE E3421	09-May-23/R	< 25	< 25		
PHC F2 (>C10-C16)	µg/L	50	MOE E3421	09-May-23/K	< 50	< 50		
PHC F3 (>C16-C34)	µg/L	400	MOE E3421	09-May-23/K	< 400	< 400		
PHC F4 (>C34-C50)	µg/L	400	MOE E3421	09-May-23/K	< 400	< 400		
Acetone	µg/L	30	EPA 8260	09-May-23/R	< 30	< 30	< 30	< 30
Benzene	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	µg/L	2	EPA 8260	09-May-23/R	< 2	< 2	< 2	< 2
Bromoform	µg/L	5	EPA 8260	09-May-23/R	< 5	< 5	< 5	< 5
Bromomethane	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	µg/L	0.2	EPA 8260	09-May-23/R	< 0.2	< 0.2	< 0.2	< 0.2
Monochlorobenzene (Chlorobenzene)	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	µg/L	1	EPA 8260	09-May-23/R	< 1	< 1	< 1	< 1
Dibromochloromethane	µg/L	2	EPA 8260	09-May-23/R	< 2	< 2	< 2	< 2
Dichlorobenzene,1,2-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,3-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4-	µg/L	0.5	EPA 8260	09-May-23/R	< 0.5	< 0.5	< 0.5	< 0.5



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Director of Laboratory Services

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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-3	P-3	Trip Blank	Field Blank
					Sample I.D.	Date Collected			
Dichlorodifluoromethane	µg/L	2	EPA 8260	09-May-23/R	B23-03303-5	05-May-23	B23-03303-6	05-May-23	B23-03303-8
Dichloroethane, 1,1-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethane, 1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethylene, 1,1-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethene, cis-1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloroethene, trans-1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropane, 1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene, cis-1,3-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene, trans-1,3-	µg/L	0.5	EPA 8260	09-May-23/R					
Dichloropropene 1,3-cis+trans	µg/L	0.5	EPA 8260	09-May-23/R					
Ethylbenzene	µg/L	0.5	EPA 8260	09-May-23/R					
Dibromoethane, 1,2- (Ethylene Dibromide)	µg/L	0.2	EPA 8260	09-May-23/R					
Hexane	µg/L	5	EPA 8260	09-May-23/R					
Methyl Ethyl Ketone	µg/L	20	EPA 8260	09-May-23/R					
Methyl Isobutyl Ketone	µg/L	20	EPA 8260	09-May-23/R					



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-3	P-3	Trip Blank	Field Blank
					Sample I.D.	Date Collected			
Methyl-t-butyl Ether	µg/L	2	EPA 8260	09-May-23/R	B23-03303-5	05-May-23	B23-03303-6	B23-03303-7	B23-03303-8
Dichloromethane (Methylene Chloride)	µg/L	5	EPA 8260	09-May-23/R					
Styrene	µg/L	0.5	EPA 8260	09-May-23/R					
Tetrachloroethane, 1,1,1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Tetrachloroethane, 1,1,2,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Tetrachloroethylene	µg/L	0.5	EPA 8260	09-May-23/R					
Toluene	µg/L	0.5	EPA 8260	09-May-23/R					
Trichloroethane, 1,1,1-	µg/L	0.5	EPA 8260	09-May-23/R					
Trichloroethane, 1,1,2-	µg/L	0.5	EPA 8260	09-May-23/R					
Trichloroethylene	µg/L	0.5	EPA 8260	09-May-23/R					
Trichlorofluoromethane	µg/L	5	EPA 8260	09-May-23/R					
Vinyl Chloride	µg/L	0.2	EPA 8260	09-May-23/R					
Xylene, m,p-	µg/L	1.0	EPA 8260	09-May-23/R					
Xylene, o-	µg/L	0.5	EPA 8260	09-May-23/R					
Xylene, m,p,o-	µg/L	1.1	EPA 8260	09-May-23/R					



Steve Garrett
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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	MW-3	P-3	Trip Blank	Field Blank
Sample I.D.	B23-03303-5	B23-03303-6	B23-03303-7	B23-03303-8
Date Collected	05-May-23	05-May-23	05-May-23	05-May-23

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed
-----------	-------	------	------------------	--------------------

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
 F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
 F2 C10-C16 hydrocarbons in µg/g, (F2-naphth if requested)
 F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
 F4 C34-C50 hydrocarbons in µg/g
 This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

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Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met.
 If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
 QC will be made available upon request.



Steve Garrett
 Director of Laboratory Services

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REPORT No. B23-03303 (iii)

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DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6
					Sample I.D.	B23-03303-1	B23-03303-2	B23-03303-3	B23-03303-4
					Date Collected	05-May-23	05-May-23	05-May-23	05-May-23
Acenaphthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	µg/L	0.01	EPA 8270	11-May-23/K	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(b+k)fluoranthene	µg/L	0.1	EPA 8270	11-May-23/K	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(g,h,i)perylene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chrysene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dibenzo(a,h)anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene,1-	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene,2-	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methylnaphthalene 2-(1-)	µg/L	1	EPA 8270	11-May-23/K	< 1	< 1	< 1	< 1	< 1



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DATE RECEIVED: 06-May-23

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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6						
					Sample I.D.	Date Collected									
Naphthalene	µg/L	0.05	EPA 8270	11-May-23/K	B23-03303-1	05-May-23	B23-03303-2	05-May-23	B23-03303-3	B23-03303-4	05-May-23	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	µg/L	0.05	EPA 8270	11-May-23/K								< 0.05	< 0.05	< 0.05	< 0.05
Pyrene	µg/L	0.05	EPA 8270	11-May-23/K								< 0.05	< 0.05	< 0.05	< 0.05



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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	MW-3	P-3		
Sample I.D.	B23-03303-5	B23-03303-6		
Date Collected	05-May-23	05-May-23		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Acenaphthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Acenaphthylene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Benzo(a)anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Benzo(a)pyrene	µg/L	0.01	EPA 8270	11-May-23/K	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Benzo(b+k)fluoranthene	µg/L	0.1	EPA 8270	11-May-23/K	< 0.1	< 0.1		
Benzo(g,h,i)perylene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Benzo(k)fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Chrysene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Dibenzo(a,h)anthracene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Fluoranthene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Fluorene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Indeno(1,2,3,-cd)pyrene	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Methylnaphthalene,1-	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Methylnaphthalene,2-	µg/L	0.05	EPA 8270	11-May-23/K	< 0.05	< 0.05		
Methylnaphthalene 2-(1-)	µg/L	1	EPA 8270	11-May-23/K	< 1	< 1		



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SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-3	P-3		
					Sample I.D.	Date Collected			
Naphthalene	µg/L	0.05	EPA 8270	11-May-23/K	B23-03303-5	05-May-23	B23-03303-6	05-May-23	
Phenanthrene	µg/L	0.05	EPA 8270	11-May-23/K					
Pyrene	µg/L	0.05	EPA 8270	11-May-23/K					

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
 F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
 F2 C10-C16 hydrocarbons in µg/g, (F2-naph if requested)
 F3 C16-C34 hydrocarbons in µg/g, (F3-pah if requested)
 F4 C34-C50 hydrocarbons in µg/g
 This method complies with the Reference Method for the CWS PHC and is validated for use in the laboratory.

Any deviations from the method are noted and reported for any particular sample.

nC6 and nC10 response factor is within 30% of response factor for toluene:

nC10, nC16 and nC34 response factors within 10% of each other:

C50 response factors within 70% of nC10+nC16+nC34 average:

Linearity is within 15%:

All results expressed on a dry weight basis.

Unless otherwise noted all chromatograms returned to baseline by the retention time of nC50.

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

Uncertainty values available upon request

Unless otherwise noted all extraction, analysis, QC requirements and limits for holding time were met. If analyzed for F4 and F4G they are not to be summed but the greater of the two numbers are to be used in application to the CWS PHC
 QC will be made available upon request.



Steve Garrett
 Director of Laboratory Services

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C.O.C.: G107095

REPORT No. B23-03303 (i)

Report To:

EXP Services Inc
 2650 Queensview Drive, Suite 100
 Ottawa ON K2B 8H6 Canada

Attention: Chris Kimmerly

Caduceon Environmental Laboratories

2378 Holly Lane
 Ottawa Ontario K1V 7P1

Tel: 613-526-0123

Fax: 613-526-1244

DATE RECEIVED: 06-May-23

JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed	Client I.D.	MW-5	MW-4	P-2	MW-6	
					Sample I.D.	Date Collected				
Lead	µg/L	0.02	EPA 200.8	12-May-23/O	B23-03303-1	05-May-23	0.06	0.04	0.02	< 0.1
Mercury	µg/L	0.02	SM 3112 B	11-May-23/O	B23-03303-2	05-May-23	< 0.02	< 0.02	< 0.02	< 0.02
Molybdenum	µg/L	0.1	EPA 200.8	12-May-23/O	B23-03303-3	05-May-23	1.6	1.8	2.3	2.1
Nickel	µg/L	0.2	EPA 200.8	12-May-23/O	B23-03303-4	05-May-23	1.0	1.4	0.5	2.7
Selenium	µg/L	1	EPA 200.8	12-May-23/O			4	< 1	< 1	< 5
Silver	µg/L	0.1	EPA 200.8	12-May-23/O			< 0.1	< 0.1	< 0.1	< 0.1
Thallium	µg/L	0.05	EPA 200.8	12-May-23/O			< 0.05	< 0.05	< 0.05	< 0.3
Uranium	µg/L	0.05	EPA 200.8	12-May-23/O			0.63	2.92	1.22	2.65
Vanadium	µg/L	0.1	EPA 200.8	12-May-23/O			0.4	< 0.1	0.4	< 0.5
Zinc	µg/L	5	SM 3120	10-May-23/O			< 5	< 5	< 5	< 5

1 Chromium (VI) result is based on total Chromium



Steve Garrett
 Director of Laboratory Services

R.L. = Reporting Limit

Site Analyzed: K-Kingston, W-Windsor, O-Ottawa, R-Richmond Hill, B-Barrie

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P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	MW-3	P-3		
Sample I.D.	B23-03303-5	B23-03303-6		
Date Collected	05-May-23	05-May-23		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
pH @25°C	pH Units		SM 4500H	10-May-23/O	8.11	8.01		
Conductivity @25°C	mS/cm	0.001	SM 2510B	10-May-23/O	0.566	0.849		
Chloride	mg/L	0.5	SM4110C	09-May-23/O	23.0	23.3		
Nitrate (N)	mg/L	0.1	SM4110C	09-May-23/O	1.0	0.8		
Nitrite (N)	mg/L	0.1	SM4110C	09-May-23/O	< 0.1	< 0.1		
Cyanide (Free)	µg/L	5	SM 4500CN	16-May-23/K	< 5	< 5		
Sodium	µg/L	200	SM 3120	10-May-23/O	19700	23100		
Antimony	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1		
Arsenic	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	0.1		
Barium	µg/L	1	SM 3120	10-May-23/O	239	167		
Beryllium	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1		
Boron	µg/L	5	SM 3120	10-May-23/O	119	52		
Cadmium	µg/L	0.015	EPA 200.8	12-May-23/O	< 0.015	< 0.015		
Chromium	µg/L	2	SM 3120	10-May-23/O	< 2	< 2		
Chromium (VI)	µg/L	10	MOE E3056	10-May-23/O	< 10 ¹	< 10 ¹		
Cobalt	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1		
Copper	µg/L	2	SM 3120	10-May-23/O	< 2	< 2		



Steve Garrett
 Director of Laboratory Services

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JOB/PROJECT NO.: OTT-21023795-AO

DATE REPORTED: 16-May-23

P.O. NUMBER:

SAMPLE MATRIX: Groundwater

WATERWORKS NO.

Client I.D.	MW-3	P-3		
Sample I.D.	B23-03303-5	B23-03303-6		
Date Collected	05-May-23	05-May-23		

Parameter	Units	R.L.	Reference Method	Date/Site Analyzed				
Lead	µg/L	0.02	EPA 200.8	12-May-23/O	0.05	< 0.02		
Mercury	µg/L	0.02	SM 3112 B	11-May-23/O	< 0.02	< 0.02		
Molybdenum	µg/L	0.1	EPA 200.8	12-May-23/O	1.9	1.7		
Nickel	µg/L	0.2	EPA 200.8	12-May-23/O	0.3	0.9		
Selenium	µg/L	1	EPA 200.8	12-May-23/O	< 1	4		
Silver	µg/L	0.1	EPA 200.8	12-May-23/O	< 0.1	< 0.1		
Thallium	µg/L	0.05	EPA 200.8	12-May-23/O	< 0.05	< 0.05		
Uranium	µg/L	0.05	EPA 200.8	12-May-23/O	0.36	0.64		
Vanadium	µg/L	0.1	EPA 200.8	12-May-23/O	0.2	0.4		
Zinc	µg/L	5	SM 3120	10-May-23/O	< 5	< 5		

1 Chromium (VI) result is based on total Chromium

µg/g = micrograms per gram (parts per million) and is equal to mg/Kg
 F1 C6-C10 hydrocarbons in µg/g, (F1-btex if requested)
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