

FERGUS DEVELOPMENT INC.

**FERGUS GOLF CLUB
REDEVELOPMENT
WATER SERVICING STUDY**

APRIL 2023

REPORT PREPARED FOR

883890 Ontario Limited c/o Fergus Development Inc.
3190 Steeles Avenue East, Suit 300
Markham, ON L3R 1G9

REPORT PREPARED BY

TYLin

**T.Y. LIN
INTERNATIONAL
CANADA LTD.**

8800 DUFFERIN STREET, SUITE 200,
VAUGHAN, ON L4K 0C5
(905) 738-5700

TYLIN PROJECT NUMBER 10402

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1 INTRODUCTION

1.1 Introduction

T.Y. Lin International Canada Ltd. (TYLIN) has been retained by 883890 Ontario Limited c/o Fergus Development Inc. to prepare a servicing study technical memorandum (TM) draft plan of subdivision filed for a redevelopment located in Township of Centre-Wellington, County of Wellington, Ontario. This document will identify the required water infrastructure and/or upgrades that would be needed to facilitate the new proposed redevelopment for Fergus Development Inc.

The existing golf course (the "Site"), shown on Figure 1, consists of two parcels; the northwest parcel, which is 42.35 ha, situated on the north side of Wellington Road 19, and the southeast parcel, which is 39.85 ha, situated on the south side of Wellington Road 19. The proposed residential redevelopment with 118 lots is located on the southeast parcel (the "SE Site") and the communal water and wastewater services are integrated into the existing Golf Course, which will remain, on the northwest parcel (the "NW Site"). The construction of the Water Treatment Plan (WTP) on the NW Site will serve the proposed 118 units, totaling a population of 365 people (at 3.094 people per unit). The new units will receive their drinking water via new wells and reservoir associated with the WTP. Average daily flow for this study has been assumed to be 350 Litres per Capita per Day (LPCD) as per the Township of Centre Wellington Engineering Guidelines.

1.2 Purpose

This Technical Memorandum focuses on the water servicing plan and has identified options for water servicing concepts for the Fergus golf course redevelopment. RJ Burnside and TYLIN have been retained to identify preliminary servicing concepts for this development, based on the draft plan of the subdivision prepared by GSP (January 2022) which cover the lands under control by 883890 Ontario Limited.

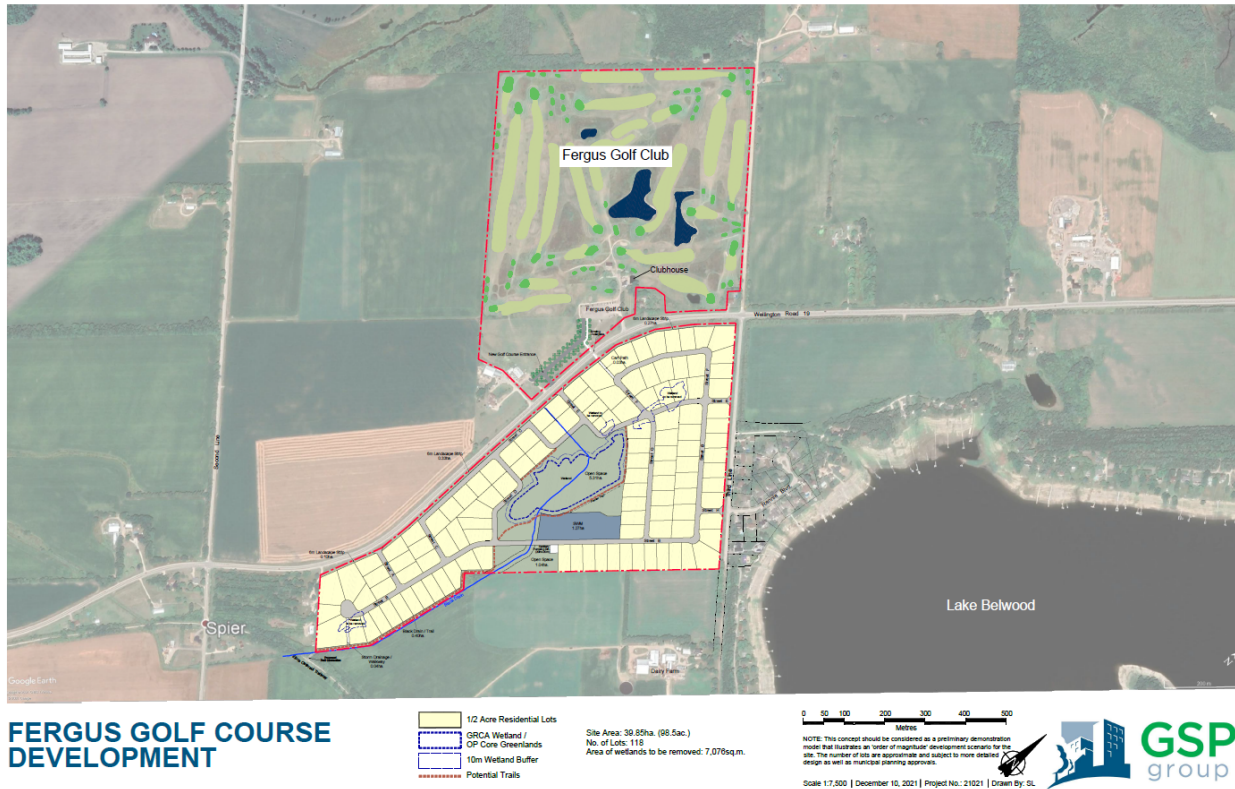


Figure 1 – Development Concept Plan

2 WATER TREATMENT PLANT

2.1 Projected Treated Water Demand

Projected maximum daily water demand that must be met by the new WTP at development build-out conditions is 5.03 L/s, as summarized in Table 1.

	Total Units	Population ¹	Avg Water Demand		Max Day Factor	Max Day Flow, L/s	Peak Hour Factor	Peak Hour L/s	Peak Insta. Factor	Peak Insta. L/s
			m ³ /day	L/s						
Residential	118	365	128	1.48	3.40	5.03	5.00	7.39	7.5	11.09

¹ Based on average of 3.094 people per unit.

² Based on average per capita demand of 350 L/day.

Table 1 - Projected Water Demands at Development Build-Out

The average daily flow is calculated using the Township guideline of 350 L/day per person, and a density of 3.094 persons per dwelling unit. In addition, the maximum day, peak hour and peak instantaneous demands have been calculated using peaking factors specifically recommended by the Drinking Water System Design Guidelines (2008) for water systems serving fewer than 500 people.

2.2 Water Supply

The raw water supply required by the new water system will be derived from two wells located in the development area. Well supply systems must be designed to provide a firm capacity (largest well out of service) which is capable of meeting projected maximum day demand for communal

systems with storage. The Water Supply Investigation conducted by Golder Associates in January 2022 concluded the well pumping rate to be 8.8 L/s, and as such confirmed the ability of wells to sustain the required flows.

2.3 Water Quality

Review of recent water quality data for observation wells and test wells at various locations near the site of the proposed new well supply, and for existing wells supplying the community suggests that the new source water will comply with all current Ontario Drinking Water Quality Standards. The hardness levels were found to be in exceedance of the operational guidelines (80 – 100 mg/L). The water test results conducted by Golder Associates can be found in Appendix B. Based on the initial water quality data the wells are assumed to be non-GUDI.

2.4 Water Treatment Requirements

The well water data indicates that only primary and secondary disinfection will be required at the water treatment plant.

The design of the WTP to serve the redevelopment is therefore based on the following assumptions:

- The proposed wells are strictly groundwater, with no direct surface water influence.
- Provisions for disinfection to achieve a minimum 2-log (99 percent) inactivation of viruses will be included, in accordance with the requirements of Ontario Regulation 170/03 (rev . June 2006).
- Provisions for inline water softeners will be implemented to achieve a reduction in water hardness levels.
 - Typically, the system recovery ranges between 70% - 75%. An increased well pumping capacity above MDD is required to compensate for the system recovery. This results in a required well pumping capacity between 6.71 L/s to 7.19 L/s. The well capacity will be further reviewed during the design phase.
- Primary disinfection will be provided by UV with secondary disinfection by sodium hypochlorite. (Chlorine will be injected prior to the clearwells with top-up prior to discharge to the distribution system)
- Cartridge filters (rated a 5 microns nominal) will be placed in front of the UV system to reduce any potential particulates from entering the UV and reducing its effectiveness.

3 PRELIMINARY SITE FOOTPRINT

3.1 Water Treatment Facility

Based on projected maximum daily system demands at development build-out, required treatment plant production capacity is approximately 5.03 L/s. Well pumps will be designed with hydraulic head capabilities sufficient to convey the water from the wells to the WTP.

Filtered water would discharge to a 591 m³ below-grade finished water reservoir. The reservoir will be two cells with storage volumes for; Fire Flow (360 m³ – 50 L/s for 2 hours), Equalization (108.6 m³) and Emergency Storage (117.15 m³). The water entering the reservoir will be dosed with sodium hypochlorite to provide secondary chlorination. A chlorine residual analyser will monitor the dosage entering the clearwells. Four high-service pumps (three duty, one standby) would convey the finished water from the reservoir to the distribution system. Fire

protection will include two fire flow pumps (one duty and one standby). The fire pumps will incorporate a constant backpressure valve to meter the pumps flow to the distribution system at a constant pressure regardless of fire flow demand.

The underground reservoir will be approximately 16 m by 13 m. Treatment, MCC, HVAC, chemical storage and pumping facilities would be housed within a 208 m² pre-engineered steel building. Control of the two well pumps and monitoring of flow rates from each well would be linked to the WTP control room. Influent flow rates at the WTP will be measured by an inline electromagnetic flow meter. Discharge to the distribution system will be monitored by a magnetic flow meter, chlorine residual analyzer and pressure sensor. A 250-kW standby generator would be provided to ensure continued service in the event of an interruption in the electrical feed to the plant. The generator will be located outside the WTP building inside a sound attenuating enclosure. A site plan illustrating the location of the water treatment plant is shown on Figure 2.

A 2-year monitoring program will be implemented to include weekly sampling for E.coli, on-line turbidity and UVT monitoring.

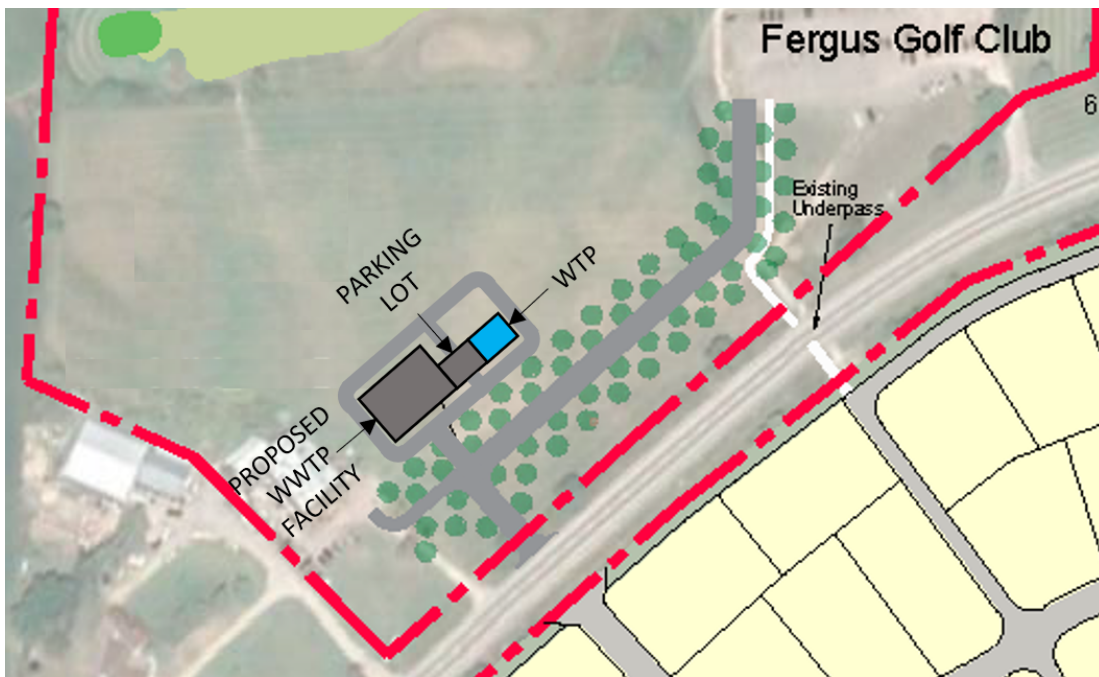


Figure 2 - Preliminary Water Treatment Plant Site Footprint

4 WATER DISTRIBUTION SYSTEM

4.1 Design Criteria

The design criteria utilized in the water model were obtained from RJ Burnside, Ministry of Environment, Conservation and Parks (MECP) and the Township of Centre Wellington. At this time, the elevations used in the model are as per the topographical survey (R - PE Surveying, 2021). The design criteria are shown in Table 2 below.

Criterion	Design Criteria	Source
People per unit	3.094	Assumed
Average Day Demand	350 Lpcd	Township
Maximum Day Factor	3.4	MECP
Peak Hour Day Factor	5.0	MECP
Fire Flow	Follow Fire Underwriter Survey	Township

Table 2 - Design Criteria

The fire flow demand for this area was calculated using Fire Underwriter Survey. The “short version” calculation provided a required fire flow of 50 L/s.

4.2 Level of Service

The water system evaluation involves assessing the system performance under various demand scenarios. The water distribution system is required to operate within pressures of 345 kPa (50 psi) to 552 kPa (80 psi) under normal operating conditions (average day and maximum day), and a slightly expanded pressure range (275 kPa (40 psi) to 700 kPa (100 psi) under peak hour conditions. A minimum of 140 kPa (20 psi) is required under the maximum day plus fire flow (MDD + FF) condition.

4.3 Watermain Network

The skeleton water network used in the water model was developed by TYLIN using the hydraulic software InfoWater. Demands were assigned to five nodes in the system to force water through multiple watermains. The design hydraulic grade line for the water distribution system was set at 475.00 m.

The modelling concluded in the requirement of a 200 mm watermain to provide MDD + FF with the levels of service identified in accordance with the MECP design guidelines. To provide circulation and reduce water quality issues at the southernmost end of the development, a re-circulation line (~ 100 mm) could be considered based on hydraulic modelling during the detailed design phase.

The skeleton water model network is illustrated in Figure 3 below.

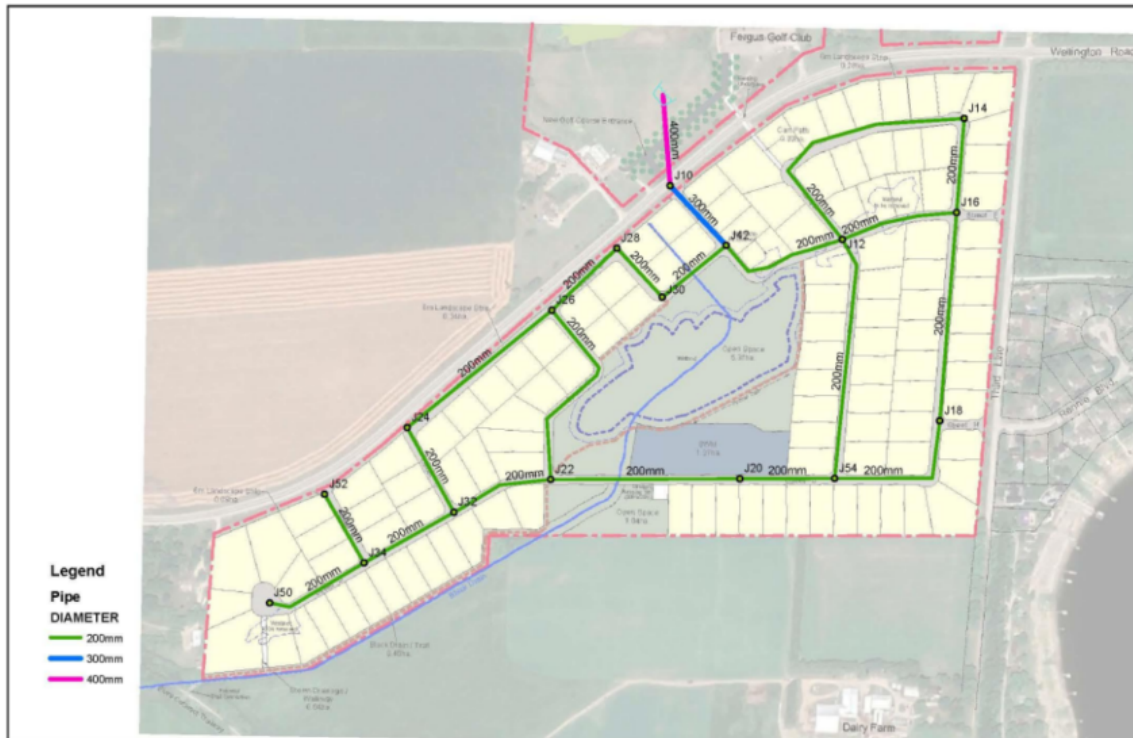


Figure 3 - Skeleton Watermain Network

Note - The water model displayed in this report does not exactly match the layout of the current redevelopment plan. However, the differences between the previous iteration and the current plan are extremely minor (reconfiguration of the park block). As the number of units and primary street network have not changed, the functional servicing requirements - namely water demand and hydraulic grade line – will not change. The modelling results presented in this report will ultimately reflect the functional needs of the revised plan. The water modelling will be updated at a later stage in this process once all other elements have been finalized.

4.4 Modelling Scenarios and Results

Four modelling scenarios were analyzed as part of this analysis to assess the system performance and conformance with the pressure level of service. These included - Average day demand, Maximum day demand, Peak hour demand and Maximum day demand plus fire flow.

The findings of the analysis are summarized in Table 3 below.

Node ID	Average Day		Maximum Day		Maximum Day Plus FF		Peak Hour	
	Demand (L/s)	Pressure (psi)	Demand (L/s)	Pressure (psi)	Demand (L/s)	Pressure (psi)	Demand (L/s)	Pressure (psi)
J14	0.30	67.17	1.01	67.15	1.01	65.94	1.48	67.13
J18	0.30	66.10	1.01	66.08	1.01	64.92	1.48	66.07
J22	0.30	68.59	1.01	68.57	1.01	65.58	1.48	68.55
J42	0.30	67.17	1.01	67.17	1.01	66.77	1.48	67.16
J50	0.30	68.23	1.01	68.21	51.01	59.02	1.48	68.19
Lowest Pressure	-	54.73	-	54.72	-	51.87	-	54.7
Highest Pressure	-	68.59	-	68.57	-	66.77	-	68.55

Table 3: Modelling Analysis

As shown above, the level of service has reached under average day, maximum day, maximum day plus fire flow and peak hour. Under maximum day demand, all nodes in the system can satisfy the fire flow requirement of 50 L/s and still maintain a minimum of 20 psi. With a hydraulic grade line of 475 m at the reservoir site, the proposed Fergus Golf Course redevelopment can be serviced. For further reference, pressure maps for all scenarios are included in Appendix A.

5 SEWAGE PUMPING STATION

5.1 Design Flows

The pump station design flows are noted in Table 4 and will be used to size the pumps and force main for the new redevelopment. This table will require updating pending any changes made by RJ Burnside when the sanitary design sheet is available. In the absence of this information, TYLIN has prepared preliminary design flow calculations for the proposed Fergus SPS.

Criteria	Value	Unit
Average Daily Flow	128	m ³ /d
Harmon Peaking Factor	4.04	-
Peak Day Dry Weather Flow	518	m ³ /d
Infiltration Flowrate ¹	516	m ³ /d
Peak Hour Wet Weather Flow	1,034	m ³ /d
Peak Instantaneous Flow ²	1,292	m ³ /d
Peak Instantaneous Flow ²	15	L/s

¹Infiltration factor of 0.15 L/s/ha (Township Development Manual)
²Peak Instantaneous Flow is the criteria used to size pump station requirements.
³Design flows calculated assuming 118 units and serviced by the SPS

Table 4 - SPS Design Flows

5.2 SPS Design Guidelines

The design features for the pump station are typically identified within the respective Townships design guidelines. Currently, these guidelines are not available within the Townships Development Manual and therefore the design features will need to be revisited with the Township once further project progress is made or confirmed with the Townships engineering department.

For the purpose of this servicing study, the SPS design features will be designed in accordance with MECP design guidelines.

As such, the following design features are proposed:

- A subgrade concrete wet well that will house a trash screen, pump, controls (floats/level transmitter) and discharge piping.
- A separate subgrade valve chamber that will house all the valving and instrumentation.
- An outdoor electrical panel that will house the electrical equipment and controls (i.e., motor control centers, automatic transfer switch, PLC, etc.)
- An outdoor emergency standby generator (fuel type to be confirmed based on availability).
- An odour control unit (OCU).

Other considerations that will require further discussion with the Township of Centre Wellington is the need for an emergency storage chamber.

5.3 Forcemain

5.3.1 Sizing

The forcemain (FM) pipe size in Table 5 is acceptable to comply with MECP design guidelines which recommends a flow velocity within a forcemain to range between 0.6 L/s to 2.0 L/s. The flow velocities are calculated using the peak instantaneous flow the corresponding pipe diameter.

Forcemain ID (mm)	Flow Velocity (m/s)
150	0.85

Table 5 - Calculated flow velocities

5.3.2 Horizontal Alignment

Figure 4 illustrates the proposed horizontal alignment to service the Fergus redevelopment.

- The proposed alignment will generally follow the right of way proposed by the GSP Site Plan from the SPS to the Fergus Golf Course WWTF with the exception of a small section which will follow the proposed trail alignment. The FM alignment has an estimated length of 730 m.

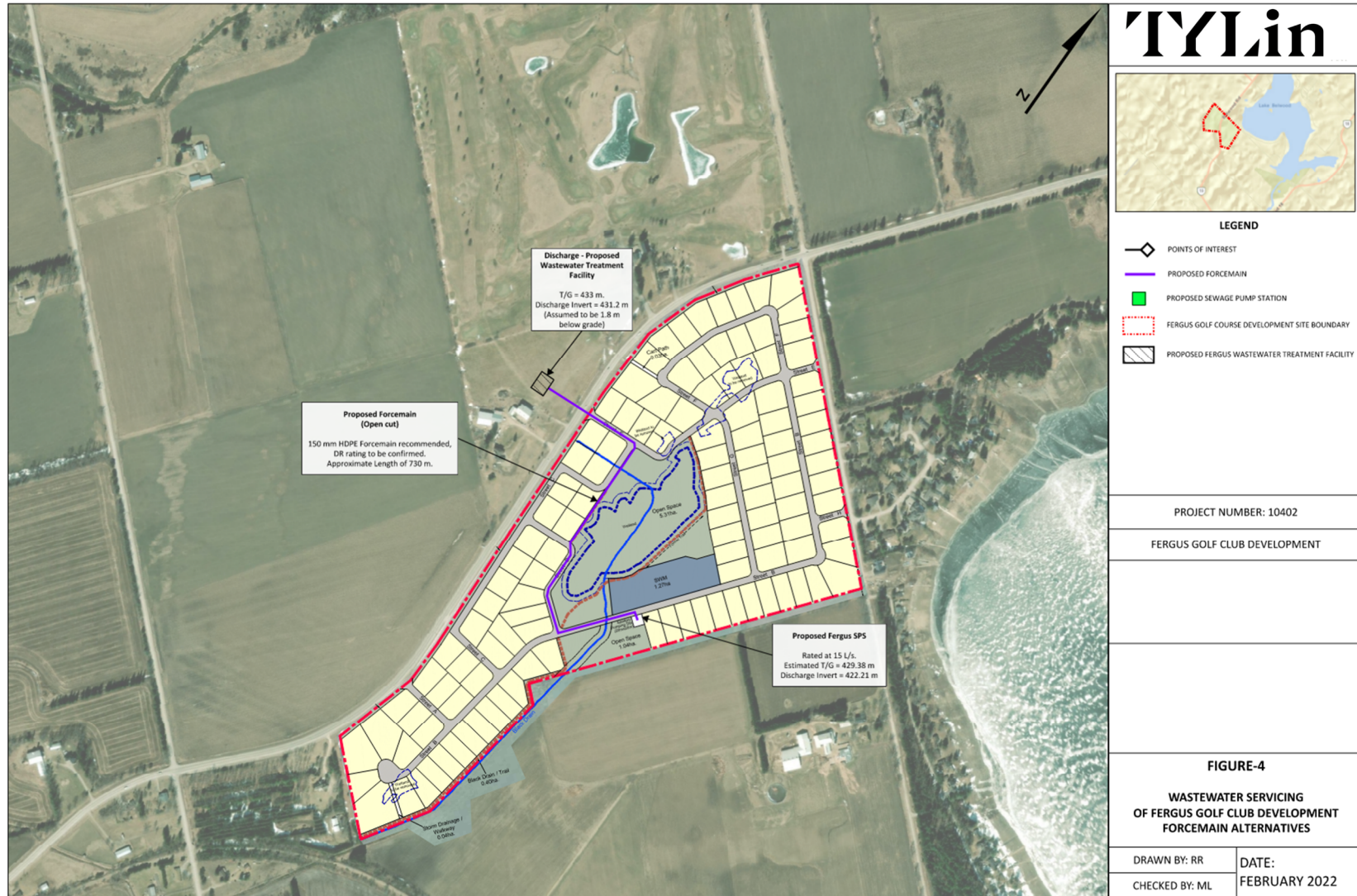


Figure 4 - Fergus Development Forcemain Alternatives

5.3.3 Vertical Alignment

The current forcemain alignment and general profile based on topographic information extracted from Google Earth has been identified in Figure 5.

The forcemain vertical alignment shall be designed to remain full during pump cycling. Keeping the forcemain full will reduce the impacts of hydraulic transients from occurring within the system.



Figure 5 – Proposed Forcemain Vertical Alignment (Google Earth)

6 REFERENCES

Golder Associates Ltd. (2022). *Water Quality Test Results*

Golder Associates Ltd. (2022). *Desktop Water Supply Investigation Report*

Golder Associates Ltd. (2022). *Preliminary Geotechnical Investigation*

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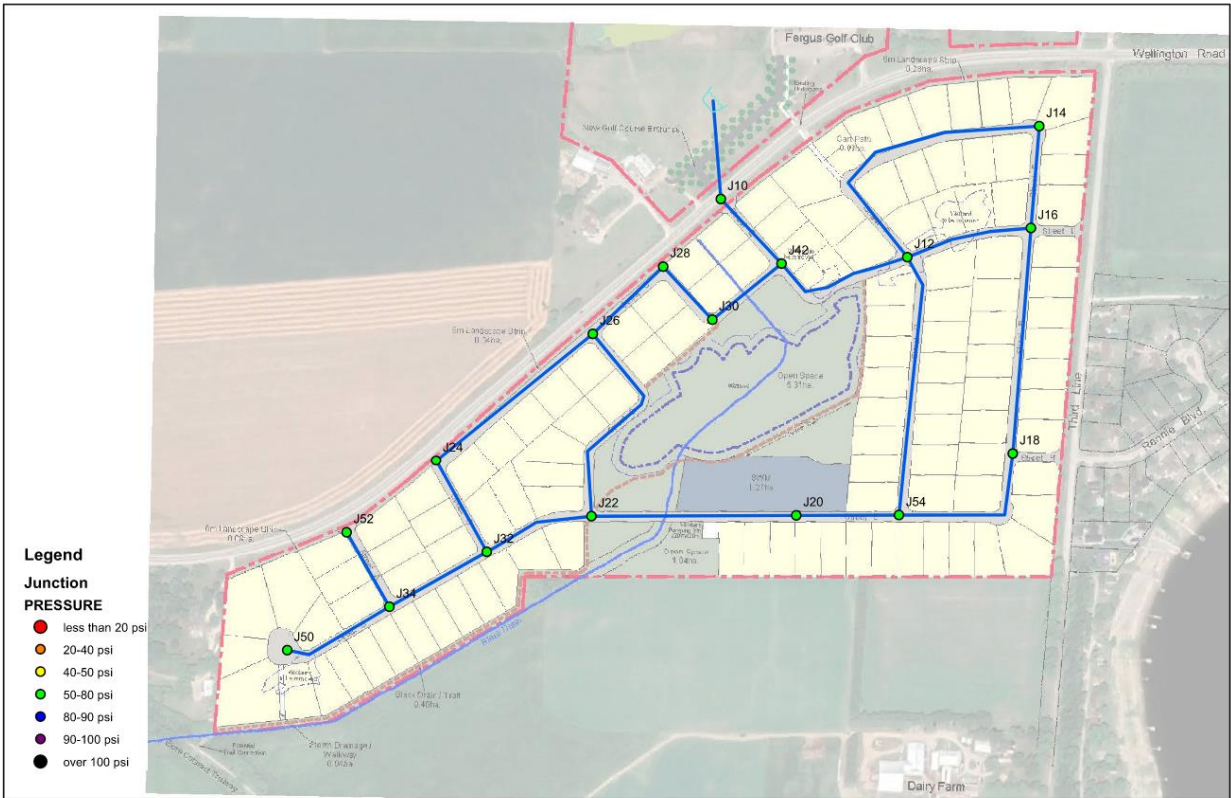
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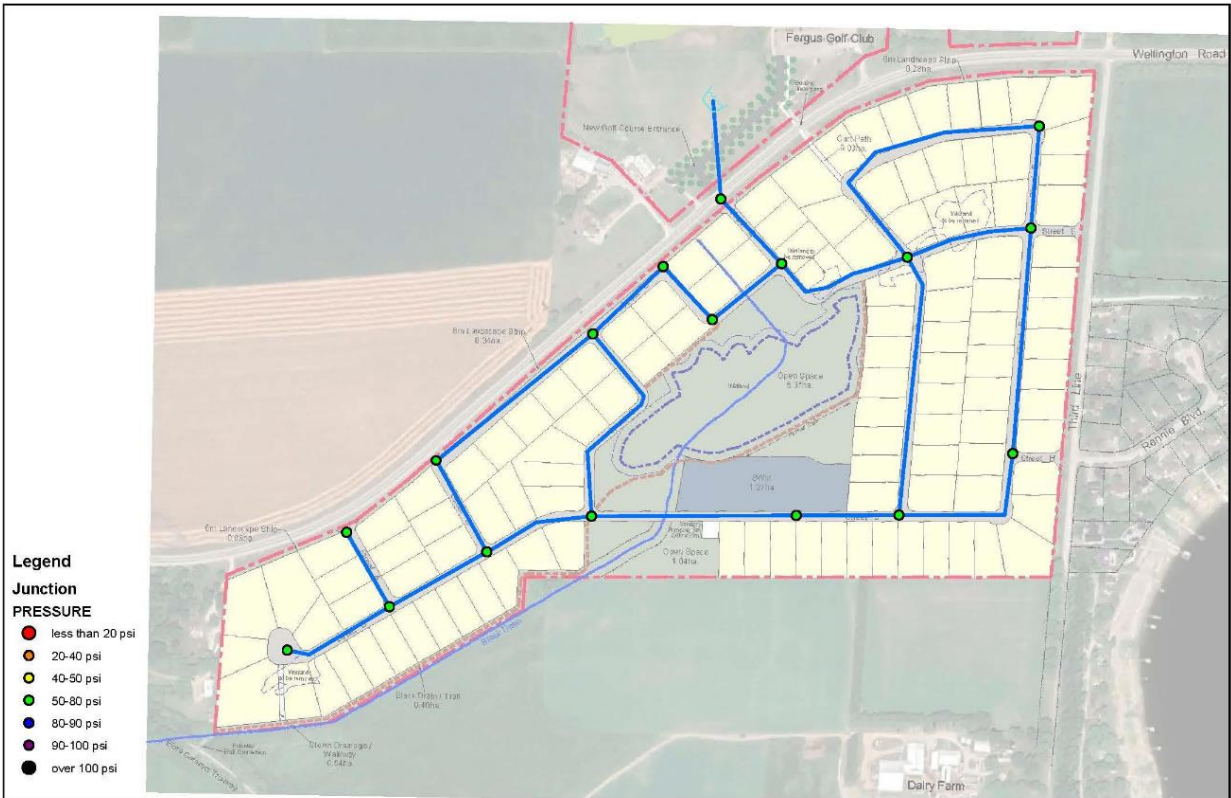
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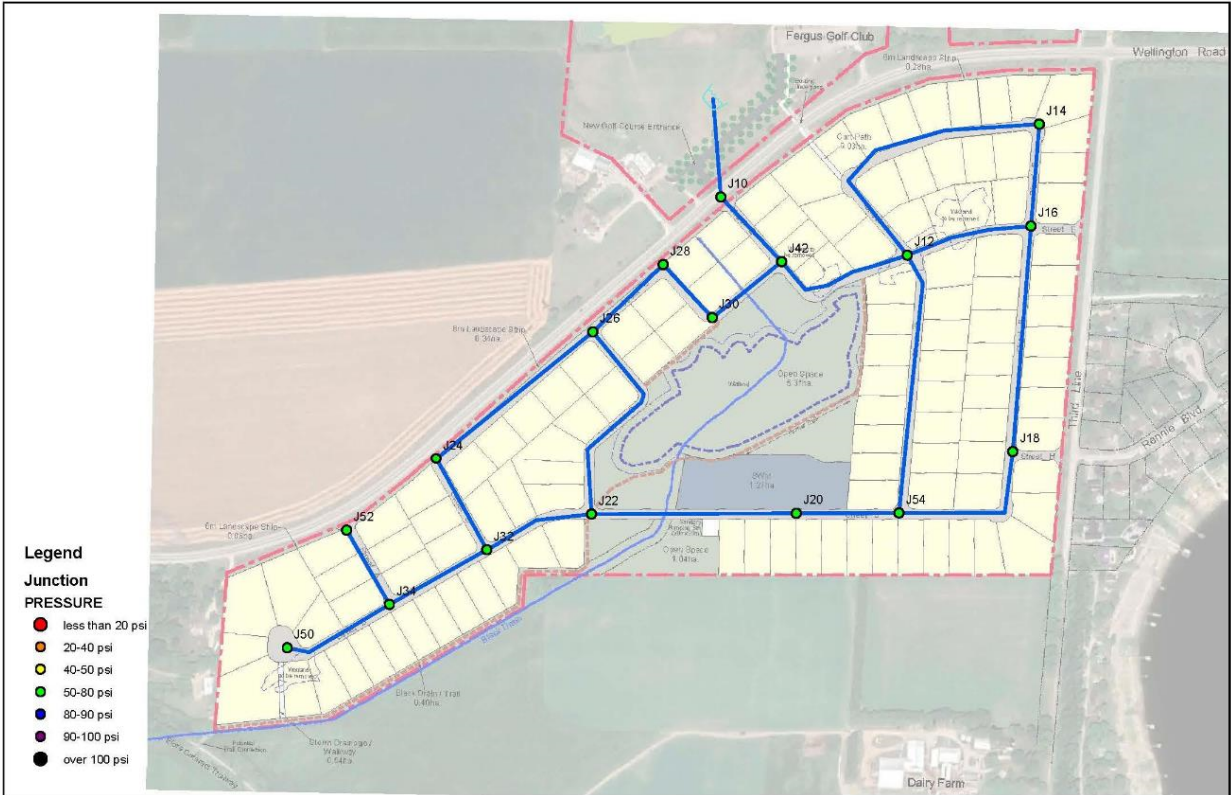
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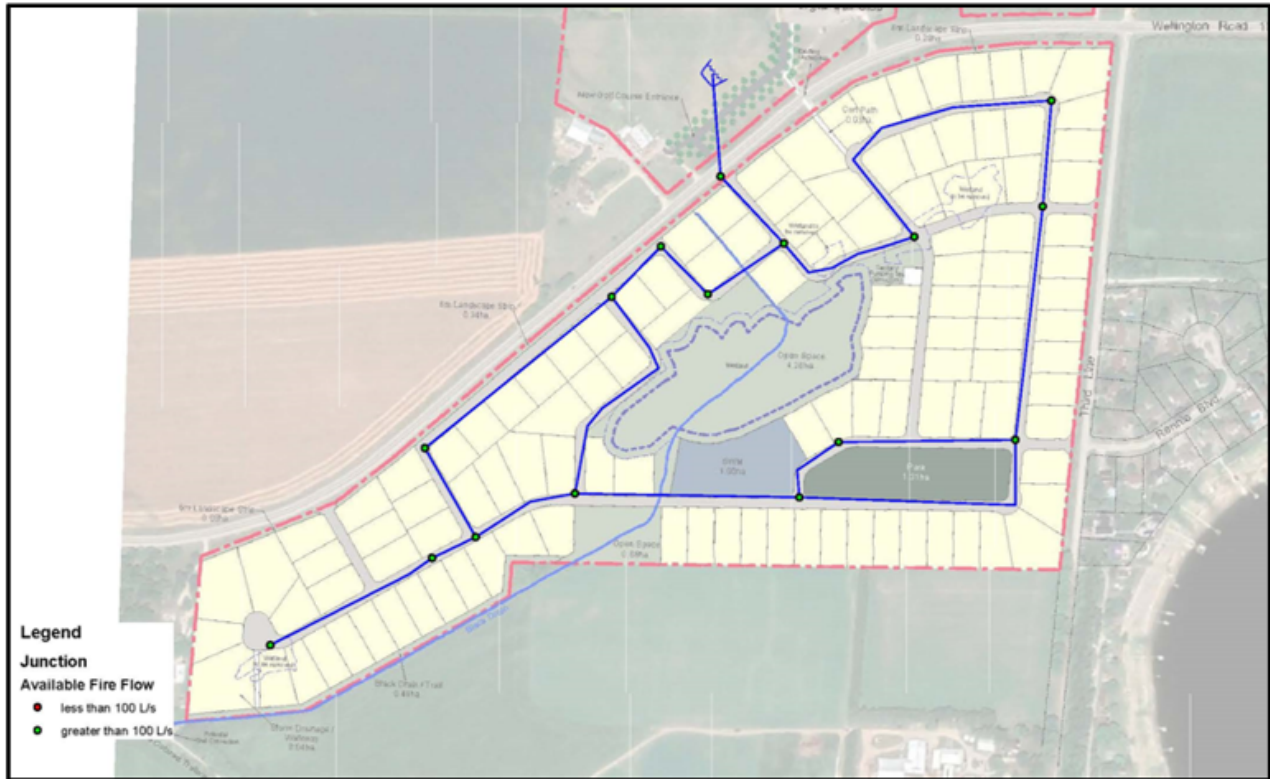
APPENDIX A

Pressure Maps









APPENDIX B

Water Quality Test Results



Your Project #: 21456909
Your C.O.C. #: 842984-01-01

Attention: Gregory Padusenko

Golder Associates Ltd
210 Sheldon Drive
Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/22
Report #: R6822678
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BV LABS JOB #: C1P4129

Received: 2021/09/03, 13:54

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Alkalinity	1	N/A	2021/09/07	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00463	SM 23 4500-Cl E m
Colour	1	N/A	2021/09/09	CAM SOP-00412	SM 23 2120C m
Free (WAD) Cyanide	1	N/A	2021/09/10	CAM SOP-00457	OMOE E3015 m
Diuron, Guthion, Temephos	1	2021/09/10	2021/09/10	CAM SOP-00306	EPA 532 m
Dissolved Organic Carbon (DOC) (1)	1	N/A	2021/09/08	CAM SOP-00446	SM 23 5310 B m
Diquat / Paraquat	1	2021/09/07	2021/09/09	CAM SOP-00327	EPA 549.2 m
Fluoride	1	2021/09/04	2021/09/07	CAM SOP-00449	SM 23 4500-F C m
Glyphosate	1	2021/09/09	2021/09/09	CAM SOP-00305	HPLC in-house method
Hardness (calculated as CaCO ₃)	1	N/A	2021/09/08	CAM SOP 00102/00408/00447	SM 2340 B
Mercury in Water by CVAA	1	2021/09/07	2021/09/07	CAM SOP-00453	EPA 7470A m
Metals Analysis by ICPMS (as received) (2)	1	N/A	2021/09/07	CAM SOP-00447	EPA 6020B m
Total Coliforms/ E. coli, CFU/100mL	1	N/A	2021/09/03	CAM SOP-00551	MOE E3407
Dissolved Methane in Water	1	N/A	2021/09/08	CAM SOP-00219 Modified Combustible Gas Indicator Method	RSKSOP-175 m
Heterotrophic plate count, (CFU/mL)	1	N/A	2021/09/03	CAM SOP-00512	SM 9215B
Microcystin	1	N/A	2021/09/08	CAM SOP-00476	OMECC-LSB E3469
NDMA in Drinking Water (MSABN-3291Amod)	1	2021/09/09	2021/09/14	BRL SOP-00012	MOE Method E3388
Total Ammonia-N	1	N/A	2021/09/09	CAM SOP-00441	USGS I-2522-90 m
Nitrate (NO ₃) and Nitrite (NO ₂) in Water (3)	1	N/A	2021/09/07	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Nitritotriacetic Acid (NTA) (4)	1	2021/09/07	2021/09/07	CAM SOP-00411	EPA 430.1 m
OC Pesticides (Selected) & PCB (5)	1	2021/09/08	2021/09/10	CAM SOP-00307	EPA 8081A/ 8082B m
OC Pesticides Summed Parameters	1	N/A	2021/09/04	CAM SOP-00307	EPA 8081A/8082B m
ODWS - Semi-Volatiles	1	2021/09/09	2021/09/10	CAM SOP-00301	EPA 8270 m
Organic Nitrogen	1	N/A	2021/09/10	Auto Calc.	
pH	1	2021/09/04	2021/09/07	CAM SOP-00413	SM 4500H+ B m
Sulphate by Automated Colourimetry	1	N/A	2021/09/07	CAM SOP-00464	EPA 375.4 m
Sulphide	1	N/A	2021/09/07	CAM SOP-00455	SM 23 4500-S G m
Total Dissolved Solids (TDS calc)	1	N/A	2021/09/08		Auto Calc

BV Labs - Partial/Rush Results



BV Labs - Partial/Rush Results

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BV LABS JOB #: C1P4129

Received: 2021/09/03, 13:54

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Analytical Method
		Extracted	Analyzed		
Total Kjeldahl Nitrogen in Water	1	2021/09/07	2021/09/09	CAM SOP-00938	OMOE E3516 m
Turbidity	1	N/A	2021/09/07	CAM SOP-00417	SM 23 2130 B m
VOCs (Drinking Water)	1	N/A	2021/09/07	CAM SOP-00226	EPA 8260C m

Remarks:

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

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

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

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

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

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Metals analysis was performed on the sample 'as received'.

(3) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

(4) Bureau Veritas Laboratories attempt to commence NTA analysis as soon as possible in accordance with the reference method. However, rapid analysis may not be practically achievable, particularly for samples from remote locations. Extended delay in analysis times may increase the uncertainty of the test results, but does not necessarily imply that the results are compromised.

(5) Chlordane (Total) = Alpha Chlordane + Gamma Chlordane



BV Labs - Partial/Rush Results

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Your C.O.C. #: 842984-01-01

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Cambridge, ON
CANADA N1T 1A8

Report Date: 2021/09/22
Report #: R6822678
Version: 2 - Partial

CERTIFICATE OF ANALYSIS – PARTIAL RESULTS

BV LABS JOB #: C1P4129

Received: 2021/09/03, 13:54

Encryption Key

Ema Gitej
Senior Project Manager
22 Sep 2021 18:22:54

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Ema Gitej, Senior Project Manager
Email: emese.gitej@bureauveritas.com
Phone# (905)817-5829

=====
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BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

RESULTS OF ANALYSES OF WATER

BV Labs ID				QOI268		
Sampling Date				2021/09/03 10:00		
COC Number				842984-01-01		
	UNITS	MAC	A/O	PW21-1	RDL	QC Batch
Calculated Parameters						
Calculated TDS	mg/L	-	500	550	1.0	7559099
Hardness (CaCO3)	mg/L	-	80:100	380	1.0	7558603
Total Organic Nitrogen	mg/L	-	0.15	<0.10	0.10	7560118
Inorganics						
Total Ammonia-N	mg/L	-	-	0.21	0.050	7564744
Colour	TCU	-	5	<2	2	7563603
Fluoride (F-)	mg/L	1.5	-	0.62	0.10	7560960
Total Kjeldahl Nitrogen (TKN)	mg/L	-	-	0.23	0.10	7563005
Microcystin	ug/L	-	-	<0.10	0.10	7564587
Dissolved Organic Carbon	mg/L	-	5	0.48	0.40	7562606
pH	pH	-	6.5:8.5	8.02		7560966
Dissolved Sulphate (SO4)	mg/L	-	500	270	1.0	7560983
Sulphide	mg/L	-	0.05	<0.020	0.020	7562455
Turbidity	NTU	-	5	0.7	0.1	7560716
WAD Cyanide (Free)	mg/L	0.2	-	<0.0010	0.0010	7567661
Alkalinity (Total as CaCO3)	mg/L	-	30:500	180	1.0	7560961
Dissolved Chloride (Cl-)	mg/L	-	250	9.6	1.0	7560985
Nitrite (N)	mg/L	1	-	<0.010	0.010	7560968
Nitrate (N)	mg/L	10	-	<0.10	0.10	7560968
Nitrate + Nitrite (N)	mg/L	10	-	<0.10	0.10	7560968
Miscellaneous Parameters						
NTA	mg/L	0.4	-	<0.050	0.050	7561547
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)						

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

PERMANENT GASES (WATER)

BV Labs ID			QOI268		
Sampling Date			2021/09/03 10:00		
COC Number			842984-01-01		
	UNITS	A/O	PW21-1	RDL	QC Batch
Fixed Gases					
Methane	L/m3	3	0.019	0.005	7565203
RDL = Reportable Detection Limit QC Batch = Quality Control Batch A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)					

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

BV Labs ID				QOI268		
Sampling Date				2021/09/03 10:00		
COC Number				842984-01-01		
	UNITS	MAC	A/O	PW21-1	RDL	QC Batch
Metals						
Mercury (Hg)	mg/L	0.001	-	<0.00010	0.00010	7562014
Aluminum (Al)	ug/L	-	100	<4.9	4.9	7561948
Antimony (Sb)	ug/L	6	-	<0.50	0.50	7561948
Arsenic (As)	ug/L	10	-	1.5	1.0	7561948
Barium (Ba)	ug/L	1000	-	21	2.0	7561948
Boron (B)	ug/L	5000	-	74	10	7561948
Cadmium (Cd)	ug/L	5	-	<0.090	0.090	7561948
Calcium (Ca)	ug/L	-	-	93000	200	7561948
Chromium (Cr)	ug/L	50	-	<5.0	5.0	7561948
Copper (Cu)	ug/L	-	1000	<0.90	0.90	7561948
Iron (Fe)	ug/L	-	300	130	100	7561948
Lead (Pb)	ug/L	10	-	<0.50	0.50	7561948
Magnesium (Mg)	ug/L	-	-	36000	50	7561948
Manganese (Mn)	ug/L	-	50	20	2.0	7561948
Potassium (K)	ug/L	-	-	1100	200	7561948
Selenium (Se)	ug/L	50	-	<2.0	2.0	7561948
Sodium (Na)	ug/L	-	200000	28000	100	7561948
Uranium (U)	ug/L	20	-	0.16	0.10	7561948
Zinc (Zn)	ug/L	-	5000	<5.0	5.0	7561948
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC, A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)						

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID				QOI268		
Sampling Date				2021/09/03 10:00		
COC Number				842984-01-01		
	UNITS	MAC	A/O	PW21-1	RDL	QC Batch
Semivolatile Organics						
2,3,4,6-Tetrachlorophenol	ug/L	100	1	<0.50	0.50	7566501
2,4,5-T	ug/L	280	-	<1.0	1.0	7566501
2,4,6-Trichlorophenol	ug/L	5	2	<0.50	0.50	7566501
2,4-D	ug/L	100	-	<1.0	1.0	7566501
2,4-Dichlorophenol	ug/L	900	0.3	<0.25	0.25	7566501
Alachlor	ug/L	5	-	<0.50	0.50	7566501
Aldicarb	ug/L	-	-	<5.0	5.0	7566501
Atrazine	ug/L	-	-	<0.50	0.50	7566501
Des-ethyl atrazine	ug/L	-	-	<0.50	0.50	7566501
Atrazine + Desethyl-atrazine	ug/L	5	-	<1.0	1.0	7566501
Bendiocarb	ug/L	-	-	<2.0	2.0	7566501
Bromoxynil	ug/L	5	-	<0.50	0.50	7566501
Carbaryl	ug/L	90	-	<5.0	5.0	7566501
Carbofuran	ug/L	90	-	<5.0	5.0	7566501
Chlorpyrifos (Dursban)	ug/L	90	-	<1.0	1.0	7566501
Cyanazine (Bladex)	ug/L	-	-	<1.0	1.0	7566501
Diazinon	ug/L	20	-	<1.0	1.0	7566501
Dicamba	ug/L	120	-	<1.0	1.0	7566501
Diclofop-methyl	ug/L	9	-	<0.90	0.90	7566501
Dimethoate	ug/L	20	-	<2.5	2.5	7566501
Dinoseb	ug/L	10	-	<1.0	1.0	7566501
Malathion	ug/L	190	-	<5.0	5.0	7566501
Metolachlor	ug/L	50	-	<0.50	0.50	7566501
Metribuzin (Sencor)	ug/L	80	-	<5.0	5.0	7566501
Ethyl Parathion	ug/L	50	-	<1.0	1.0	7566501
Pentachlorophenol	ug/L	60	30	<0.50	0.50	7566501
Phorate	ug/L	2	-	<0.50	0.50	7566501
Picloram	ug/L	190	-	<5.0	5.0	7566501
Prometryne	ug/L	1	-	<0.25	0.25	7566501
Simazine	ug/L	10	-	<1.0	1.0	7566501
Terbufos	ug/L	1	-	<0.50	0.50	7566501
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)						

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

SEMI-VOLATILE ORGANICS BY GC-MS (WATER)

BV Labs ID				QOI268		
Sampling Date				2021/09/03 10:00		
COC Number				842984-01-01		
	UNITS	MAC	A/O	PW21-1	RDL	QC Batch
Triallate	ug/L	230	-	<1.0	1.0	7566501
Trifluralin	ug/L	45	-	<1.0	1.0	7566501
Benzo(a)pyrene	ug/L	0.01	-	<0.0050	0.0050	7566501
Methyl parathion	ug/L	-	-	<1.0	1.0	7566501
Surrogate Recovery (%)						
2,4,6-Tribromophenol	%	-	-	78		7566501
2,4-Dichlorophenyl Acetic Acid	%	-	-	79		7566501
2-Fluorobiphenyl	%	-	-	69		7566501
D14-Terphenyl (FS)	%	-	-	83		7566501
D5-Nitrobenzene	%	-	-	83		7566501
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)						

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

VOLATILE ORGANICS BY GC/MS (WATER)

BV Labs ID				QOI268		
Sampling Date				2021/09/03 10:00		
COC Number				842984-01-01		
	UNITS	MAC	A/O	PW21-1	RD L	QC Batch
Volatile Organics						
1,1-Dichloroethylene	ug/L	14	-	<0.10	0.10	7559332
1,2-Dichlorobenzene	ug/L	200	3	<0.20	0.20	7559332
1,2-Dichloroethane	ug/L	5	-	<0.20	0.20	7559332
1,4-Dichlorobenzene	ug/L	5	1	<0.20	0.20	7559332
Benzene	ug/L	1	-	<0.10	0.10	7559332
Bromodichloromethane	ug/L	-	-	<0.10	0.10	7559332
Bromoform	ug/L	-	-	<0.20	0.20	7559332
Carbon Tetrachloride	ug/L	2	-	<0.10	0.10	7559332
Chlorobenzene	ug/L	80	30	<0.10	0.10	7559332
Chloroform	ug/L	-	-	<0.10	0.10	7559332
Dibromochloromethane	ug/L	-	-	<0.20	0.20	7559332
Methylene Chloride(Dichloromethane)	ug/L	50	-	<0.50	0.50	7559332
Ethylbenzene	ug/L	140	1.6	<0.10	0.10	7559332
Tetrachloroethylene	ug/L	10	-	<0.10	0.10	7559332
Toluene	ug/L	60	24	<0.20	0.20	7559332
Trichloroethylene	ug/L	5	-	<0.10	0.10	7559332
Vinyl Chloride	ug/L	1	-	<0.20	0.20	7559332
o-Xylene	ug/L	-	-	<0.10	0.10	7559332
p+m-Xylene	ug/L	-	-	<0.10	0.10	7559332
Total Xylenes	ug/L	90	20	<0.10	0.10	7559332
Total Trihalomethanes	ug/L	-	-	<0.20	0.20	7559332
Surrogate Recovery (%)						
4-Bromofluorobenzene	%	-	-	96		7559332
D4-1,2-Dichloroethane	%	-	-	96		7559332
D8-Toluene	%	-	-	106		7559332
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC,A/O: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)						

BV Labs - Partial/Rush Results



PESTICIDES & HERBICIDES BY HPLC (WATER)

BV Labs ID			QOI268		
Sampling Date			2021/09/03 10:00		
COC Number			842984-01-01		
	UNITS	MAC	PW21-1	RDL	QC Batch
Pesticides & Herbicides					
Glyphosate	ug/L	280	<10	10	7567026
Diquat	ug/L	70	<7.0	7.0	7561822
Diuron	ug/L	150	<10	10	7569961
Guthion (Azinphos-methyl)	ug/L	20	<2.0	2.0	7569961
Paraquat	ug/L	10	<1.0	1.0	7561822
Temephos	ug/L	-	<10	10	7569961
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)					

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

ORGANOCHLORINATED PESTICIDES BY GC-ECD (WATER)

BV Labs ID			QOI268		
Sampling Date			2021/09/03 10:00		
COC Number			842984-01-01		
	UNITS	MAC	PW21-1	RDL	QC Batch
Calculated Parameters					
Aldrin + Dieldrin	ug/L	0.7	<0.006	0.006	7558226
Chlordane (Total)	ug/L	7	<0.006	0.006	7558226
DDT+ Metabolites	ug/L	30	<0.006	0.006	7558226
Heptachlor + Heptachlor epoxide	ug/L	3	<0.006	0.006	7558226
Total PCB	ug/L	3	<0.05	0.05	7558226
Pesticides & Herbicides					
Lindane	ug/L	4	<0.0060	0.0060	7565829
Heptachlor	ug/L	-	<0.0060	0.0060	7565829
Aldrin	ug/L	-	<0.0060	0.0060	7565829
Heptachlor epoxide	ug/L	-	<0.0060	0.0060	7565829
Oxychlordane	ug/L	-	<0.0060	0.0060	7565829
g-Chlordane	ug/L	-	<0.0060	0.0060	7565829
a-Chlordane	ug/L	-	<0.0060	0.0060	7565829
Dieldrin	ug/L	-	<0.0060	0.0060	7565829
o,p-DDE	ug/L	-	<0.0060	0.0060	7565829
p,p-DDE	ug/L	-	<0.0060	0.0060	7565829
o,p-DDD	ug/L	-	<0.0060	0.0060	7565829
p,p-DDD	ug/L	-	<0.0060	0.0060	7565829
o,p-DDT	ug/L	-	<0.0060	0.0060	7565829
p,p-DDT	ug/L	-	<0.0060	0.0060	7565829
Methoxychlor	ug/L	900	<0.024	0.024	7565829
Aroclor 1016	ug/L	-	<0.050	0.050	7565829
Aroclor 1221	ug/L	-	<0.050	0.050	7565829
Aroclor 1232	ug/L	-	<0.050	0.050	7565829
Aroclor 1242	ug/L	-	<0.050	0.050	7565829
Aroclor 1248	ug/L	-	<0.050	0.050	7565829
Aroclor 1254	ug/L	-	<0.050	0.050	7565829
Aroclor 1260	ug/L	-	<0.050	0.050	7565829
Surrogate Recovery (%)					
2,4,5,6-Tetrachloro-m-xylene	%	-	50		7565829
Decachlorobiphenyl	%	-	104		7565829
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)					

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

SEMI-VOLATILE ORGANICS BY HRMS (WATER)

BV Labs ID			QOI268		
Sampling Date			2021/09/03 10:00		
COC Number			842984-01-01		
	UNITS	MAC	PW21-1	RDL	QC Batch
Semivolatile Organics					
N-Nitrosodimethylamine	ug/L	0.009	<0.0009	0.0009	7566404
Surrogate Recovery (%)					
D6-N-Nitrosodimethylamine	%	-	39		7566404
RDL = Reportable Detection Limit QC Batch = Quality Control Batch MAC: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)					

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

MICROBIOLOGY (WATER)

BV Labs ID			QO1268	
Sampling Date			2021/09/03 10:00	
COC Number			842984-01-01	
	UNITS	MAC	PW21-1	QC Batch
Microbiological				
Heterotrophic plate count	CFU/mL	-	0	7560282
Background	CFU/100mL	-	0	7560239
Total Coliforms	CFU/100mL	0	0	7560239
Escherichia coli	CFU/100mL	0	0	7560239
QC Batch = Quality Control Batch MAC: Ontario Drinking Water Standards - Maximum Acceptable Concentration [MAC] & Table 4-Chemical/Physical Objectives [A/O] - Not Health Related, respectively (Made under the Ontario Safe Drinking Water Act, 2002)				

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

TEST SUMMARY

BV Labs ID: QOI268
Sample ID: PW21-1
Matrix: Water

Collected: 2021/09/03
Shipped:
Received: 2021/09/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7560961	N/A	2021/09/07	Yogesh Patel
Chloride by Automated Colourimetry	KONE	7560985	N/A	2021/09/07	Alina Dobreanu
Colour	SPEC	7563603	N/A	2021/09/09	Viorica Rotaru
Free (WAD) Cyanide	SKAL/CN	7567661	N/A	2021/09/10	Aditiben Patel
Diuron, Guthion, Temephos	LC/UV	7569961	2021/09/10	2021/09/10	Kimberley Linde
Dissolved Organic Carbon (DOC)	TOCV/NDIR	7562606	N/A	2021/09/08	Julianna Castiglione
Diquat / Paraquat	LC/UV	7561822	2021/09/07	2021/09/09	James Lee
Fluoride	ISE	7560960	2021/09/04	2021/09/07	Yogesh Patel
Glyphosate	LC/FLU	7567026	2021/09/09	2021/09/09	Furneesh Kumar
Hardness (calculated as CaCO3)		7558603	N/A	2021/09/08	Automated Statchk
Mercury in Water by CVAA	CV/AA	7562014	2021/09/07	2021/09/07	Gagandeep Rai
Metals Analysis by ICPMS (as received)	ICP/MS	7561948	N/A	2021/09/07	Azita Fazaeli
Total Coliforms/ E. coli, CFU/100mL	PL	7560239	N/A	2021/09/03	Soham Patel
Dissolved Methane in Water	GC/FID	7565203	N/A	2021/09/08	Shilpa Kataria
Heterotrophic plate count, (CFU/mL)	PL	7560282	N/A	2021/09/03	Farhana Rahman
Microcystin	ELIS	7564587	N/A	2021/09/08	Chris Li
NDMA in Drinking Water (MSABN-3291Amod)	GCTQ/MS	7566404	2021/09/09	2021/09/14	Wenhui (Susie) Shi
Total Ammonia-N	LACH/NH4	7564744	N/A	2021/09/09	Viorica Rotaru
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7560968	N/A	2021/09/07	Chandra Nandlal
Nitrotriacetic Acid (NTA)	SPEC	7561547	2021/09/07	2021/09/07	Viorica Rotaru
OC Pesticides (Selected) & PCB	GC/ECD	7565829	2021/09/08	2021/09/10	Joy Zhang
OC Pesticides Summed Parameters	CALC	7558226	N/A	2021/09/04	Automated Statchk
ODWS - Semi-Volatiles	GC/MS	7566501	2021/09/09	2021/09/10	Wendy Zhao
Organic Nitrogen	CALC	7560118	N/A	2021/09/10	Automated Statchk
pH	AT	7560966	2021/09/04	2021/09/07	Yogesh Patel
Sulphate by Automated Colourimetry	KONE	7560983	N/A	2021/09/07	Alina Dobreanu
Sulphide	ISE/S	7562455	N/A	2021/09/07	Neil Dassanayake
Total Dissolved Solids (TDS calc)	CALC	7559099	N/A	2021/09/08	Automated Statchk
Total Kjeldahl Nitrogen in Water	SKAL	7563005	2021/09/07	2021/09/09	Rajni Tyagi
Turbidity	AT	7560716	N/A	2021/09/07	Neil Dassanayake
VOCs (Drinking Water)	P&T/MS	7559332	N/A	2021/09/07	Dina Wang

BV Labs ID: QOI268 Dup
Sample ID: PW21-1
Matrix: Water

Collected: 2021/09/03
Shipped:
Received: 2021/09/03

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	7560961	N/A	2021/09/07	Yogesh Patel
Diuron, Guthion, Temephos	LC/UV	7569961	2021/09/10	2021/09/10	Kimberley Linde
Fluoride	ISE	7560960	2021/09/04	2021/09/07	Yogesh Patel
Mercury in Water by CVAA	CV/AA	7562014	2021/09/07	2021/09/07	Gagandeep Rai
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	7560968	N/A	2021/09/07	Chandra Nandlal
pH	AT	7560966	2021/09/04	2021/09/07	Yogesh Patel
VOCs (Drinking Water)	P&T/MS	7559332	N/A	2021/09/07	Dina Wang

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

GENERAL COMMENTS

Results relate only to the items tested.

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129

Report Date: 2021/09/22

QUALITY ASSURANCE REPORT

Golder Associates Ltd

Client Project #: 21456909

Sampler Initials: PM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7559332	4-Bromofluorobenzene	2021/09/07	98	70 - 130	97	70 - 130	94	%				
7559332	D4-1,2-Dichloroethane	2021/09/07	91	70 - 130	95	70 - 130	98	%				
7559332	D8-Toluene	2021/09/07	105	70 - 130	103	70 - 130	105	%				
7565829	2,4,5,6-Tetrachloro-m-xylene	2021/09/09	58	30 - 130	57	30 - 130	58	%				
7565829	Decachlorobiphenyl	2021/09/09	108	30 - 130	95	30 - 130	98	%				
7566404	D6-N-Nitrosodimethylamine	2021/09/14			39	10 - 85	40	%				
7566501	2,4,6-Tribromophenol	2021/09/09	77	30 - 130	76	30 - 130	82	%				
7566501	2,4-Dichlorophenyl Acetic Acid	2021/09/09	75	30 - 130	71	30 - 130	77	%				
7566501	2-Fluorobiphenyl	2021/09/09	63	30 - 130	65	30 - 130	67	%				
7566501	D14-Terphenyl (FS)	2021/09/09	81	30 - 130	81	30 - 130	87	%				
7566501	D5-Nitrobenzene	2021/09/09	75	30 - 130	77	30 - 130	85	%				
7559332	1,1-Dichloroethylene	2021/09/07	93	70 - 130	92	70 - 130	<0.10	ug/L	NC	30		
7559332	1,2-Dichlorobenzene	2021/09/07	88	70 - 130	90	70 - 130	<0.20	ug/L	NC	30		
7559332	1,2-Dichloroethane	2021/09/07	78	70 - 130	83	70 - 130	<0.20	ug/L	NC	30		
7559332	1,4-Dichlorobenzene	2021/09/07	105	70 - 130	105	70 - 130	<0.20	ug/L	NC	30		
7559332	Benzene	2021/09/07	81	70 - 130	84	70 - 130	<0.10	ug/L	NC	30		
7559332	Bromodichloromethane	2021/09/07	NC	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
7559332	Bromoform	2021/09/07	82	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
7559332	Carbon Tetrachloride	2021/09/07	88	70 - 130	88	70 - 130	<0.10	ug/L	NC	30		
7559332	Chlorobenzene	2021/09/07	90	70 - 130	90	70 - 130	<0.10	ug/L	NC	30		
7559332	Chloroform	2021/09/07	NC	70 - 130	89	70 - 130	<0.10	ug/L	NC	30		
7559332	Dibromochloromethane	2021/09/07	82	70 - 130	87	70 - 130	<0.20	ug/L	NC	30		
7559332	Ethylbenzene	2021/09/07	88	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
7559332	Methylene Chloride(Dichloromethane)	2021/09/07	85	70 - 130	86	70 - 130	<0.50	ug/L	NC	30		
7559332	o-Xylene	2021/09/07	87	70 - 130	86	70 - 130	<0.10	ug/L	NC	30		
7559332	p+m-Xylene	2021/09/07	95	70 - 130	90	70 - 130	<0.10	ug/L	NC	30		
7559332	Tetrachloroethylene	2021/09/07	85	70 - 130	83	70 - 130	<0.10	ug/L	NC	30		
7559332	Toluene	2021/09/07	88	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
7559332	Total Trihalomethanes	2021/09/07					<0.20	ug/L	NC	30		
7559332	Total Xylenes	2021/09/07					<0.10	ug/L	NC	30		
7559332	Trichloroethylene	2021/09/07	92	70 - 130	91	70 - 130	<0.10	ug/L	NC	30		

BV Labs - Partial/Rush Results



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VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7559332	Vinyl Chloride	2021/09/07	92	70 - 130	88	70 - 130	<0.20	ug/L	NC	30		
7560716	Turbidity	2021/09/07			99	85 - 115	<0.1	NTU	5.2	20		
7560960	Fluoride (F-)	2021/09/07	101	80 - 120	96	80 - 120	<0.10	mg/L	1.4	20		
7560961	Alkalinity (Total as CaCO3)	2021/09/07			96	85 - 115	<1.0	mg/L	0.48	20		
7560966	pH	2021/09/07			101	98 - 103			0.36	N/A		
7560968	Nitrate (N)	2021/09/07	99	80 - 120	101	80 - 120	<0.10	mg/L	NC	20		
7560968	Nitrite (N)	2021/09/07	104	80 - 120	103	80 - 120	<0.010	mg/L	NC	20		
7560983	Dissolved Sulphate (SO4)	2021/09/07	NC	75 - 125	103	80 - 120	<1.0	mg/L	0.25	20		
7560985	Dissolved Chloride (Cl-)	2021/09/07	NC	80 - 120	104	80 - 120	<1.0	mg/L	1.3	20		
7561547	NTA	2021/09/07	83	80 - 120	93	80 - 120	<0.050	mg/L	NC	20		
7561822	Diquat	2021/09/09	83	50 - 130	95	50 - 130	<7.0	ug/L	4.2	40		
7561822	Paraquat	2021/09/09	62	50 - 130	101	50 - 130	<1.0	ug/L	7.7	40		
7561948	Aluminum (Al)	2021/09/07	101	80 - 120	101	80 - 120	<4.9	ug/L	NC	20		
7561948	Antimony (Sb)	2021/09/07	103	80 - 120	99	80 - 120	<0.50	ug/L	NC	20		
7561948	Arsenic (As)	2021/09/07	100	80 - 120	97	80 - 120	<1.0	ug/L	0.41	20		
7561948	Barium (Ba)	2021/09/07	97	80 - 120	98	80 - 120	<2.0	ug/L	1.4	20		
7561948	Boron (B)	2021/09/07	97	80 - 120	97	80 - 120	<10	ug/L	2.0	20		
7561948	Cadmium (Cd)	2021/09/07	100	80 - 120	100	80 - 120	<0.090	ug/L	NC	20		
7561948	Calcium (Ca)	2021/09/07	NC	80 - 120	99	80 - 120	<200	ug/L	2.1	20		
7561948	Chromium (Cr)	2021/09/07	100	80 - 120	99	80 - 120	<5.0	ug/L	NC	20		
7561948	Copper (Cu)	2021/09/07	98	80 - 120	98	80 - 120	<0.90	ug/L	11	20		
7561948	Iron (Fe)	2021/09/07	98	80 - 120	97	80 - 120	<100	ug/L	1.1	20		
7561948	Lead (Pb)	2021/09/07	96	80 - 120	98	80 - 120	<0.50	ug/L	NC	20		
7561948	Magnesium (Mg)	2021/09/07	NC	80 - 120	97	80 - 120	<50	ug/L	1.4	20		
7561948	Manganese (Mn)	2021/09/07	98	80 - 120	99	80 - 120	<2.0	ug/L	1.0	20		
7561948	Potassium (K)	2021/09/07	98	80 - 120	96	80 - 120	<200	ug/L	1.9	20		
7561948	Selenium (Se)	2021/09/07	103	80 - 120	102	80 - 120	<2.0	ug/L	NC	20		
7561948	Sodium (Na)	2021/09/07	97	80 - 120	98	80 - 120	<100	ug/L	1.2	20		
7561948	Uranium (U)	2021/09/07	100	80 - 120	104	80 - 120	<0.10	ug/L	3.0	20		
7561948	Zinc (Zn)	2021/09/07	98	80 - 120	98	80 - 120	<5.0	ug/L	NC	20		
7562014	Mercury (Hg)	2021/09/07	95	75 - 125	97	80 - 120	<0.00010	mg/L	NC	20		

BV Labs - Partial/Rush Results



BUREAU
VERITAS

BV Labs Job #: C1P4129
Report Date: 2021/09/22

QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7562455	Sulphide	2021/09/07	103	80 - 120	103	80 - 120	<0.020	mg/L	NC	20		
7562606	Dissolved Organic Carbon	2021/09/08	80	80 - 120	96	80 - 120	<0.40	mg/L	0.84	20		
7563005	Total Kjeldahl Nitrogen (TKN)	2021/09/09	NC	80 - 120	95	80 - 120	<0.10	mg/L			96	80 - 120
7563603	Colour	2021/09/09			99	80 - 120	<2	TCU	NC	25		
7564587	Microcystin	2021/09/08	96	60 - 140	94	60 - 140	<0.10	ug/L	NC	20		
7564744	Total Ammonia-N	2021/09/09	100	75 - 125	97	80 - 120	<0.050	mg/L	2.8	20		
7565203	Methane	2021/09/09					<0.005	L/m3	6.1	20		
7565829	a-Chlordane	2021/09/09	89	30 - 130	85	30 - 130	<0.0060	ug/L	6.5	40		
7565829	Aldrin	2021/09/09	78	30 - 130	71	30 - 130	<0.0060	ug/L	5.0	40		
7565829	Aroclor 1016	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1221	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1232	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1242	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1248	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1254	2021/09/09					<0.050	ug/L				
7565829	Aroclor 1260	2021/09/09					<0.050	ug/L				
7565829	Dieldrin	2021/09/09	105	30 - 130	99	30 - 130	<0.0060	ug/L	5.2	40		
7565829	g-Chlordane	2021/09/09	94	30 - 130	85	30 - 130	<0.0060	ug/L	5.6	40		
7565829	Heptachlor epoxide	2021/09/09	100	30 - 130	89	30 - 130	<0.0060	ug/L	3.4	40		
7565829	Heptachlor	2021/09/09	83	30 - 130	75	30 - 130	<0.0060	ug/L	6.1	40		
7565829	Lindane	2021/09/09	97	30 - 130	88	30 - 130	<0.0060	ug/L	3.7	40		
7565829	Methoxychlor	2021/09/09	110	30 - 130	100	30 - 130	<0.024	ug/L	6.6	40		
7565829	o,p-DDD	2021/09/09	105	30 - 130	102	30 - 130	<0.0060	ug/L	6.0	40		
7565829	o,p-DDE	2021/09/09	114	30 - 130	94	30 - 130	<0.0060	ug/L	4.5	40		
7565829	o,p-DDT	2021/09/09	104	30 - 130	90	30 - 130	<0.0060	ug/L	7.6	40		
7565829	Oxychlorodane	2021/09/09	91	30 - 130	84	30 - 130	<0.0060	ug/L	5.0	40		
7565829	p,p-DDD	2021/09/09	101	30 - 130	93	30 - 130	<0.0060	ug/L	6.0	40		
7565829	p,p-DDE	2021/09/09	82	30 - 130	74	30 - 130	<0.0060	ug/L	6.8	40		
7565829	p,p-DDT	2021/09/09	107	30 - 130	91	30 - 130	<0.0060	ug/L	9.9	40		
7566404	N-Nitrosodimethylamine	2021/09/14			102	65 - 135	<0.0009	ug/L	1.5	25		
7566501	2,3,4,6-Tetrachlorophenol	2021/09/09	83	30 - 130	82	30 - 130	<0.50	ug/L	1.7	40		

BV Labs - Partial/Rush Results



BUREAU
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BV Labs Job #: C1P4129
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QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7566501	2,4,5-T	2021/09/09	82	30 - 130	80	30 - 130	<1.0	ug/L	4.9	40		
7566501	2,4,6-Trichlorophenol	2021/09/09	77	30 - 130	78	30 - 130	<0.50	ug/L	2.4	40		
7566501	2,4-D	2021/09/09	74	30 - 130	70	30 - 130	<1.0	ug/L	3.3	40		
7566501	2,4-Dichlorophenol	2021/09/09	68	30 - 130	69	30 - 130	<0.25	ug/L	0.99	40		
7566501	Alachlor	2021/09/09	108	40 - 130	108	40 - 130	<0.50	ug/L	2.0	40		
7566501	Aldicarb	2021/09/09	89	70 - 130	90	70 - 130	<5.0	ug/L	3.4	40		
7566501	Atrazine + Desethyl-atrazine	2021/09/09	64	30 - 130	62	30 - 130	<1.0	ug/L	0.36	40		
7566501	Atrazine	2021/09/09	86	30 - 130	84	30 - 130	<0.50	ug/L	0.95	40		
7566501	Bendiocarb	2021/09/09	89	40 - 130	90	40 - 130	<2.0	ug/L	2.4	40		
7566501	Benzo(a)pyrene	2021/09/09	101	30 - 130	96	30 - 130	<0.0050	ug/L	3.3	40		
7566501	Bromoxynil	2021/09/09	87	40 - 130	85	40 - 130	<0.50	ug/L	1.3	40		
7566501	Carbaryl	2021/09/09	91	40 - 130	91	40 - 130	<5.0	ug/L	0.80	40		
7566501	Carbofuran	2021/09/09	92	40 - 130	90	40 - 130	<5.0	ug/L	0.47	40		
7566501	Chlorpyrifos (Dursban)	2021/09/09	86	40 - 130	86	40 - 130	<1.0	ug/L	3.0	40		
7566501	Cyanazine (Bladex)	2021/09/09	80	40 - 130	76	40 - 130	<1.0	ug/L	1.9	40		
7566501	Des-ethyl atrazine	2021/09/09	42	30 - 130	40	30 - 130	<0.50	ug/L	3.1	40		
7566501	Diazinon	2021/09/09	77	40 - 130	78	40 - 130	<1.0	ug/L	2.4	40		
7566501	Dicamba	2021/09/09	75	30 - 130	73	30 - 130	<1.0	ug/L	2.8	40		
7566501	Diclofop-methyl	2021/09/09	89	40 - 130	87	40 - 130	<0.90	ug/L	1.2	40		
7566501	Dimethoate	2021/09/09	76	40 - 130	74	40 - 130	<2.5	ug/L	1.9	40		
7566501	Dinoseb	2021/09/09	84	40 - 130	82	40 - 130	<1.0	ug/L	1.3	40		
7566501	Ethyl Parathion	2021/09/09	80	40 - 130	78	40 - 130	<1.0	ug/L	0.67	40		
7566501	Malathion	2021/09/09	86	40 - 130	85	40 - 130	<5.0	ug/L	0.19	40		
7566501	Methyl parathion	2021/09/09	81	30 - 130	79	30 - 130	<1.0	ug/L	0.14	40		
7566501	Metolachlor	2021/09/09	77	40 - 130	77	40 - 130	<0.50	ug/L	0.72	40		
7566501	Metribuzin (Sencor)	2021/09/09	107	40 - 130	105	40 - 130	<5.0	ug/L	0.63	40		
7566501	Pentachlorophenol	2021/09/09	80	25 - 130	79	25 - 130	<0.50	ug/L	0.13	40		
7566501	Phorate	2021/09/09	74	40 - 130	74	40 - 130	<0.50	ug/L	2.5	40		
7566501	Picloram	2021/09/09	41	10 - 130	38	10 - 130	<5.0	ug/L	13	40		
7566501	Prometryne	2021/09/09	85	30 - 130	81	30 - 130	<0.25	ug/L	4.9	40		
7566501	Simazine	2021/09/09	80	40 - 130	78	40 - 130	<1.0	ug/L	0.038	40		

BV Labs - Partial/Rush Results



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QUALITY ASSURANCE REPORT(CONT'D)

Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

QC Batch	Parameter	Date	Matrix Spike		SPIKED BLANK		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
7566501	Terbufos	2021/09/09	79	40 - 130	79	40 - 130	<0.50	ug/L	1.3	40		
7566501	Triallate	2021/09/09	84	40 - 130	83	40 - 130	<1.0	ug/L	1.2	40		
7566501	Trifluralin	2021/09/09	94	40 - 130	91	40 - 130	<1.0	ug/L	3.6	40		
7567026	Glyphosate	2021/09/09	106	50 - 130	108	50 - 130	<10	ug/L	NC	40		
7567661	WAD Cyanide (Free)	2021/09/10	97	80 - 120	98	80 - 120	<0.0010	mg/L	NC	20		
7569961	Diuron	2021/09/10	88	40 - 130	85	40 - 130	<10	ug/L	NC	40		
7569961	Guthion (Azinphos-methyl)	2021/09/10	102	40 - 130	98	40 - 130	<2.0	ug/L	NC	40		
7569961	Temephos	2021/09/10	70	40 - 130	65	40 - 130	<10	ug/L	NC	40		

N/A = Not Applicable

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

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

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

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

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

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

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

BV Labs - Partial/Rush Results



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BV Labs Job #: C1P4129
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Golder Associates Ltd
Client Project #: 21456909
Sampler Initials: PM

VALIDATION SIGNATURE PAGE

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

Brad Newman, B.Sc., C.Chem., Scientific Service Specialist

Eva Pranjic, M.Sc., C.Chem, Scientific Specialist

Farhana Rahman, Senior Analyst

Melissa DiGrazia, Operations Manager, HRMS Department

Soham Patel, Analyst 2

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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

BV Labs - Partial/Rush Results



Bureau Veritas Laboratories
6740 Campbell Road, Mississauga, Ontario Canada L5N 2L8 Tel (905) 817-5700 Toll-free 800-563-6266 Fax (905) 817-5777 www.bvlabs.com

CHAIN OF CUSTODY RECORD

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INVOICE TO:		REPORT TO:		PROJECT INFORMATION:		Laboratory Use Only:	
Company Name: #21375 Golder Associates Ltd		Company Name: Gregory Padusenko		Quotation #: B80683		BV Labs Job #:	
Attention: Accounts Payable		Attention: Gregory Padusenko		P.O. #:		Bottle Order #:	
Address: 210 Sheldon Drive		Address:		Project: 21456909		842984	
Cambridge ON N1T 1A8				Project Name:		COC #:	
Tel: (519) 620-8182 Fax:		Tel: (519) 620-8182 Ext: 6509 Fax: (519) 620-9878		Site #:		Project Manager:	
Email: CanadaAccountsPayableInvoices@golder.com		Email: Gregory_Padusenko@golder.com		Sampled By: PEM		C#842984-01-01	

MOE REGULATED DRINKING WATER OR WATER INTENDED FOR HUMAN CONSUMPTION MUST BE SUBMITTED ON THE BV LABS DRINKING WATER CHAIN OF CUSTODY					ANALYSIS REQUESTED (PLEASE BE SPECIFIC)										Turnaround Time (TAT) Required: Please provide advance notice for rush projects			
Regulation 153 (2011) <input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Medium/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> For RSC <input type="checkbox"/> Table		Other Regulations <input type="checkbox"/> CCME <input type="checkbox"/> Sanitary Sewer Bylaw <input type="checkbox"/> Reg 558 <input type="checkbox"/> Storm Sewer Bylaw <input type="checkbox"/> MISA <input type="checkbox"/> Municipality _____ <input type="checkbox"/> PWQO <input type="checkbox"/> Reg 406 Table _____ <input type="checkbox"/> Other _____		Special Instructions	Field Filtered (please circle): Metals / Hg / Cr / V DDWSOG Tables 1, 2 and 4											Regular (Standard) TAT: (will be applied if Rush TAT is not specified) Standard TAT = 5-7 Working days for most tests. Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.		
Include Criteria on Certificate of Analysis (Y/N)?																Job Specific Rush TAT (if applies to entire submission) Date Required: _____ Time Required: _____ Rush Confirmation Number: _____ (call lab for #)		
Sample Barcode Label	Sample (Location) Identification		Date Sampled	Time Sampled		Matrix											# of Bottles	Comments
	Pw 21-1		2/09/03	10:00		GW											27	disregard date on label

REC'D IN WATERLOO

03-Sep-21 13:54
Ema Gitej
C1P4129
YTH ENV-1270
On Ice Packs

* RELINQUISHED BY: (Signature/Print) Pd [Signature] / Pd [Signature]		Date: (YY/MM/DD) 21/09/03		Time 13:55		RECEIVED BY: (Signature/Print) [Signature]		Date: (YY/MM/DD) 20/09/03		Time 13:54		# jars used and not submitted	Laboratory Use Only	

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

* SAMPLE CONTAINER, PRESERVATION, HOLD TIME AND PACKAGE INFORMATION CAN BE VIEWED AT WWW.BVLABS.COM/RESOURCES/CHAIN-OF-CUSTODY-FORMS.

SAMPLES MUST BE KEPT COOL (< 10° C) FROM TIME OF SAMPLING UNTIL DELIVERY TO BV LABS

BV#421196 Bureau Veritas Canada (2019) Inc. ON SCE 71714 9/14/6 9/9/9 Submitted as 2 coolers

SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.
 Lakefield - Ontario - K0L 2H0
 Phone: 705-652-2000 FAX: 705-652-6365

22-September-2021

Bureau Veritas Canada - Mississauga

Attn : Subcontract Coordinator

Date Rec. : 07 September 2021
LR Report: CA15208-SEP21
Reference: Job#: C1P4129

6740 Campobello Road
 Mississauga, ON
 L5N 2L8, Canada

Copy: #1

Phone: 905-817-5798
 Fax:

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	Bromate mg/L
1: Analysis Start Date		---	16-Sep-21
2: Analysis Start Time		---	13:01
3: Analysis Completed Date		---	22-Sep-21
4: Analysis Completed Time		---	11:40
5: MAC		---	0.01
6: MDL		---	0.005
7: QC - Blank		---	< 0.005
8: QC - STD % Recovery		---	98%
9: QC - DUP % RPD		---	ND
10: NR PW21-1	03-Sep-21 10:00	14.0	< 0.005

MAC - Maximum Acceptable Concentration

MDL - SGS Method Detection Limit

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

ND - Not Detected

Method Descriptions

Parameter	Description	SGS Method Code
Bromate	Bromate by Ion Chromatograph	ME-CA-[ENV]IC-LAK-AN-006

Kimberley Didsbury
 Project Specialist,
 Environment, Health & Safety