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Our ref: 12576381-04

21 July 2022

Keefe Primett, Senior Project Manager
Consolidated Fastrate (Ottawa)
c/o CBRE Limited | Project Management Canada
333 Preston Street, 7th Floor, Preston Square, Tower 1
Ottawa, ON K1S 5N4
Canada

Hydrogeological Impact Assessment: Pre-Construction Private Supply Well Monitoring & Baseline Data – 301 Somme St., Ottawa, ON. Fastfrate Ottawa Holdings Warehouse

Dear Mr. Primett:

1. Introduction

GHD Limited (GHD) is pleased to present the following report to Consolidated Fastrate (the Client) providing the pre-construction water well monitoring data and baseline information. GHD was requested to provide a baseline assessment of neighbouring water supply wells prior to ground improvement activities related to the construction of the Fastfrate Ottawa Holdings warehouse at the above captioned location (the Site). GHD reviewed private supply wells within approximately 600 m of the Site.

The proposed warehouse is located at the municipal address 301 Somme Street in Ottawa, Ontario as shown on the **Site Location Plan, Figure 1**. The Site encompasses an area on the order of 4.0 hectares (ha) and will support a new warehouse and office building that will be privately serviced with a septic system and potable water well. The locations of the private supply water wells that were assessed by GHD are illustrated on the **Well Location Plan, Figure 2.**

The purpose of the pre-construction monitoring is to establish a baseline of groundwater levels and water quality from private supply wells that are proximal to the Site and collect the data in advance of the commencement of the construction activities. The following scope of work was completed:

1. GHD contacted each of the residents and commercial properties within approximately 600 m of the Site as part of the baseline well survey and requested if residents or commercial properties wanted to participate in the groundwater monitoring program.
2. Each resident and commercial property participated, for which GHD conducted well inspections of the private water supply wells and collected water samples for a general suite of groundwater parameters. The properties that were included in the well monitoring program were 4885 and 5213 Hawthorne Road and 3500 Rideau Road.
3. Compiled and reviewed the private supply well monitoring data collected as summarized in this letter.

2. Summary of Private Supply Well Monitoring Program

2.1 Baseline Water Well Survey

Prior to the well survey GHD reviewed municipal servicing mapping which indicated that municipal water services are provided for Power Road (to the west of Hawthorne Road and the Tomlinson Rideau Quarry & Plant). Municipal services are not provided in close proximity of the Site to the north, east and south.

The water well survey consisted of contacting the neighbouring residential and commercial properties within approximately 600 m of the Site on June 3, 2022. The properties that were contacted included 4885 and 5213 Hawthorne Road and 3500 Rideau Road. Each location agreed to participate in the well monitoring program. The furthest private well that participated is located about 580 m from the Site.

The following information was gathered during the baseline survey:

4885 Hawthorne Road

- This location is a residential property located approximately 450 m north of the Site.
- This property is serviced by a drilled well with no Ministry of the Environment, Conservation and Parks (MECP) tag affixed to the casing. The depth to the bottom of the well was measured to be 10.9 metres below ground surface (mbgs).
- The well casing extended above the existing grade by 0.1 m and was outfitted with a well cap.
- The measured water level on June 3, 2022 was 1.1 mbgs.
- The well was outfitted with a submersible pump.
- A raw water sample was collected and submitted to Caduceon Environmental (Caduceon) for analysis for a general suite of groundwater chemistry parameters.

3500 Rideau Road

- This location is a commercial property identified as the Tomlinson Rideau Quarry and Plant and is located approximately 365 m west of the Site.
- This property is serviced by a drilled bedrock well with MECP well number 1514733. Based upon the well record, the well was constructed in 1975.
- Well depth is approximately 35 m. The well record indicates that the water bearing zone provided clear, fresh water from within limestone bedrock encountered at 34 m. Bedrock was encountered at 3 m.
- The well casing extended above the existing grade by 0.3 m and was outfitted with a well cap.
- The measured water level on June 3, 2022 was 11.7 mbgs.
- The well was outfitted with a submersible pump.
- A raw water sample was collected and submitted to Caduceon for analysis for a general suite of groundwater chemistry parameters.

5213 Hawthorne Road

- This location is a commercial property identified as the Renewi Canada Limited and is located approximately 580 m south-west of the Site.
- This property is serviced by a drilled well with MECP well number A342260. A well record could not be found in the MECP database for this well. The well was reportedly recently drilled.
- The well casing extended above the existing grade by 0.7 m and was outfitted with a well cap.
- The measured water level on June 3, 2022 was 10.8 mbgs.
- The well was outfitted with a submersible pump.
- A raw water sample was collected and submitted to Caduceon for analysis for a general suite of groundwater chemistry parameters.

2.2 Analytical Data

A raw water sample was obtained from each of the private supply wells for the purpose of evaluating the background analytical concentrations prior to the commencement of construction activities. The Certificates of Analyses of the testing are presented in **Appendix A**. The data was compared with the Ontario Drinking Water Standards (ODWS) and is summarized below in **Table 1**.

Table 1 Background Groundwater Quality

Parameter	Sample Identification			Ontario Drinking Water Standards	
	4885 (4885 Hawthorne Rd)	1514733 (3500 Rideau Rd)	RENEW (Blue) (5213 Hawthorne Rd)	Maximum Acceptable Concentration (MAC)	Aesthetic Objective /Operational Guideline (AO/OG)
	Sample Date: June 3, 2022				
Hardness	**876**	**870**	**1020**	---	80-100
Alkalinity	292	357	281	---	30-500
pH (no unit)	8.01	8.08	7.94	---	6.5-8.5
Conductivity (uS/cm)	1.66	2.02	1.80	---	---
Colour (TCU)	< 2	< 2	< 2	---	5
Turbidity (NTU)	**297**	**158**	**115**	1	5
Fluoride	< 0.1	< 0.1	< 0.1	1.5	---
Chloride	89.4	**263**	106	---	250
Nitrite (as N)	< 0.1	< 0.1	< 0.1	1	---
Nitrate (as N)	< 0.1	< 0.1	< 0.1	10	---
Sulphate	< 1	409	< 1	---	500
Calcium (dissolved)	212	213	237	---	---
Magnesium (dissolved)	84.1	82.1	105	---	---
Sodium (dissolved)	**57.1**	**120**	**43.5**	20	200
Potassium (dissolved)	8.2	8.7	2.8	---	---
Copper (dissolved)	< 0.002	< 0.002	< 0.002	---	1
Iron (dissolved)	< 0.005	0.008	< 0.005	---	0.3
Manganese (dissolved)	**0.334**	**1.93**	**0.285**	---	0.05
Silica (dissolved)	9.95	6.95	12.8		
Zinc (dissolved)	< 0.005	< 0.005	< 0.005	---	5
Ammonia+Ammonium (N)	0.08	0.77	0.28	---	---
Total Kjeldahl Nitrogen (N)	0.4	0.9	0.8	---	---
Organic Nitrogen	**0.3**	< 0.1	**0.5**	---	0.15
Tannins and Lignins	< 0.5	0.6	< 0.5	---	---
Dissolved Organic Carbon	2.3	2.3	1.3	---	5
Total Coliform (cfu/100 mL)	**7**	0	0	0	---
E. Coli (cfu/100 mL)	0	0	0	0	---
Background (cfu/100 mL)	58	5	31	---	---
Sodium Adsorption Ratio	0.84	1.77	0.591	---	---
Total Dissolved Solids	**1197**	**1311**	**1298**	---	500
Langelier Index	1.29	1.45	1.25	---	---

Notes: All units are parts per million (mg/L) unless otherwise stated; (<) indicates levels that are below the detectable limits; **Bolded** values exceed their applicable ODWS; -- indicates no standard or guideline.

Although the majority of the parameters tested are within the ODWS, the following parameters exceeded their respective ODWS:

- Hardness, turbidity, sodium, manganese and total dissolved solids (TDS) were elevated in each of the samples above the ODWS;
- Organic nitrogen exceeded the ODWS at 4885 Hawthorne Rd and 5213 Hawthorne Rd wells;
- Chloride was elevated within the 3500 Rideau Rd well; and

- Total coliform was elevated in the 4885 Hawthorne Rd well. The resident was contacted and informed of the result.

3. Conclusions and Recommendations

Upon completion of the construction activities, GHD recommends that the private supply wells are re-sampled for comparison with the pre-construction baseline data. A letter will be prepared to assess if there were hydrogeological impacts from a water level and groundwater quality perspective due to the completed construction.

We trust that this letter meets with your immediate requirements. Should you have any questions or concerns regarding any aspect of this letter or should you require any further assistance, please do not hesitate to contact our office.

Regards

Jonathan Scott, B.E.Sc., CISEC.
Environmental Scientist

Robert Neck, P.Geo. (Limited)
Senior Geoscientist

July 21/22
PROFESSIONAL GEOSCIENTIST
LIMITED MEMBER
ROBERT W. NECK
2262 RN
ONTARIO

Steve Gagné, H.B.Sc.
Associate, Project Director

Figure 1: Site Location Plan
Figure 2: Well Location Plan
Appendix A: Certificate of Analysis

Figures

Paper Size ANSI A

0 70 140 210 280

Metres

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

N

CONSOLIDATED FASTFRATE
RIDEAU ROAD & SOMME STREET, OTTAWA, ON
PT LOT 26, CON 6 FROM RIDEAU RIVER
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

WELL ASSESSMENT
SITE LOCATION PLAN

Project No. 12576381
Revision No.
Date Jun 30, 2022

FIGURE 1

Q:\GIS\PROJECTS\12576000s\12576381\Layouts\202206_RPT001\12576381_RPT001_GIS001 - Site Location Plan.mxd
Print date: 30 Jun 2022 - 12:19

Imagery source: © City of Ottawa, 2019.

Data Disclaimer

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Paper Size ANSI A

0 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: North American 1983
Grid: NAD 1983 UTM Zone 18N

N

GHD

CONSOLIDATED FASTFRATE
RIDEAU ROAD & SOMME STREET, OTTAWA, ON
PT LOT 26, CON 6 FROM RIDEAU RIVER
GEOGRAPHIC TOWNSHIP OF GLOUCESTER
CITY OF OTTAWA

WELL ASSESSMENT
SUPPLY WELL LOCATIONS

Project No. 12576381
Revision No.
Date Jul 12, 2022

FIGURE 2

Q:\GIS\PROJECTS\12576000s\12576381\Layouts\202206_RPT001\12576381_202206_RPT001_GIS002 - Supply Well Locations.mxd
Print date: 12 Jul 2022 - 09:11

Imagery source: © City of Ottawa, 2019.

Appendices

Appendix A

Certificate of Analysis

CADUCEON™ ENVIRONMENTAL LABORATORIES
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CERTIFICATE OF ANALYSIS

Final Report

C.O.C.: DW 119829 **REPORT No. B22-16822**

Report To:

GHD Limited
455 Phillip Street,
Waterloo Ontario N2L 3X2 Canada
Attention: Robert Neck

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

DATE RECEIVED: 03-Jun-22
DATE REPORTED: 15-Jun-22
SAMPLE MATRIX: Drinking Water

JOB/PROJECT NO.: 12576381-04
P.O. NUMBER: 762-001491
WATERWORKS NO.

			Client I.D.		1514733	4885	RENEW (Blue)	
			Sample I.D.		B22-16822-1	B22-16822-2	B22-16822-3	
			Date Collected		03-Jun-22	03-Jun-22	03-Jun-22	
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Hardness (as CaCO3)	mg/L	1	SM 3120	08-Jun-22/O	870	876	1020	
Alkalinity(CaCO3) to pH4.5	mg/L	5	SM 2320B	08-Jun-22/O	357	292	281	
pH @25°C	pH Units		SM 4500H	08-Jun-22/O	8.08	8.01	7.94	
Conductivity @25°C	µmho/cm	1	SM 2510B	08-Jun-22/O	2020	1660	1800	
Colour	TCU	2	SM 2120C	06-Jun-22/O	< 2	< 2	< 2	
Turbidity	NTU	0.1	SM 2130	06-Jun-22/O	158	297	115	
Fluoride	mg/L	0.1	SM4110C	06-Jun-22/O	< 0.1	< 0.1	< 0.1	
Chloride	mg/L	0.5	SM4110C	06-Jun-22/O	263	89.4	106	
Nitrite (N)	mg/L	0.1	SM4110C	06-Jun-22/O	< 0.1	< 0.1	< 0.1	
Nitrate (N)	mg/L	0.1	SM4110C	06-Jun-22/O	< 0.1	< 0.1	< 0.1	
Sulphate	mg/L	1	SM4110C	06-Jun-22/O	409	< 1	< 1	
Calcium	mg/L	0.02	SM 3120	08-Jun-22/O	213 *1*	212 *1*	237 *1*	
Magnesium	mg/L	0.02	SM 3120	08-Jun-22/O	82.1	84.1	105	
Sodium	mg/L	0.2	SM 3120	08-Jun-22/O	120	57.1	43.5	
Potassium	mg/L	0.1	SM 3120	08-Jun-22/O	8.7	8.2	2.8	
Copper	mg/L	0.002	SM 3120	08-Jun-22/O	< 0.002	< 0.002	< 0.002	
Iron	mg/L	0.005	SM 3120	08-Jun-22/O	0.008	< 0.005	< 0.005	
Manganese	mg/L	0.001	SM 3120	08-Jun-22/O	1.93	0.334	0.285	
Silica	mg/L	0.02	SM 3120	08-Jun-22/O	6.95	9.95	12.8	
Zinc	mg/L	0.005	SM 3120	08-Jun-22/O	< 0.005	< 0.005	< 0.005	
Ammonia + Ammonium (N)	mg/L	0.01	SM4500-NH3-H	07-Jun-22/K	0.77	0.08	0.28	
Total Kjeldahl Nitrogen	mg/L	0.1	E3516.2	07-Jun-22/K	0.9	0.4	0.8	
Organic Nitrogen (Calculation)	mg/L	0.1	E3516.2	14-Jun-22/K	< 0.1	0.3	0.5	
Tannins and Lignins	mg/L	0.5	SM5500B	07-Jun-22/K	0.6	< 0.5	< 0.5	
Dissolved Organic Carbon	mg/L	0.2	EPA 415.2	09-Jun-22/O	2.3	2.3	1.3	

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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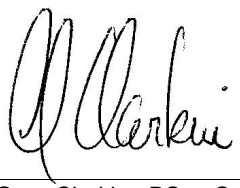
			Sample I.D.		B22-16822-1	B22-16822-2	B22-16822-3	
			Date Collected		03-Jun-22	03-Jun-22	03-Jun-22	
Parameter	**Units**	**R.L.**	**Reference Method**	**Date/Site Analyzed**				
Total Coliform	cfu/100mL	1	MOE E3407	04-Jun-22/O	0	7	0	
E coli	cfu/100mL	1	MOE E3407	04-Jun-22/O	0	0	0	
Background	cfu/100mL	1	MOE E3407	04-Jun-22/O	5	58	31	
Anion Sum	meq/L		Calc.	09-Jun-22/O	23.1	20.2	21.8	
Cation Sum	meq/L		Calc.	09-Jun-22/O	23.0	20.2	22.5	
% Difference	%		Calc.	09-Jun-22/O	0.198	0.0385	1.43	
Ion Ratio	AS/CS		Calc.	09-Jun-22/O	1.00	1.00	0.972	
Sodium Adsorption Ratio	-		Calc.	09-Jun-22/O	1.77	0.840	0.591	
TDS(ion sum calc.)	mg/L	1	Calc.	09-Jun-22/O	1311	1197	1298	
Conductivity (calc.)	µmho/cm		Calc.	09-Jun-22/O	2007	1739	1859	
TDS(calc.)/EC(actual)	-		Calc.	09-Jun-22/O	0.649	0.719	0.722	
EC(calc.)/EC(actual)	-		Calc.	09-Jun-22/O	0.994	1.05	1.03	
Langelier Index(25°C)	S.I.		Calc.	09-Jun-22/O	1.45	1.29	1.25	

1 Metals Filtered and Acidified from unpreserved General Chemistry Bottle prior to analysis



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

R.L. = Reporting Limit
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