



GOLDER

REPORT

Environmental Compliance Approval Quarterly Monitoring Report (May to August)

McCarthy Quarry

Submitted to:

Cindy Hood

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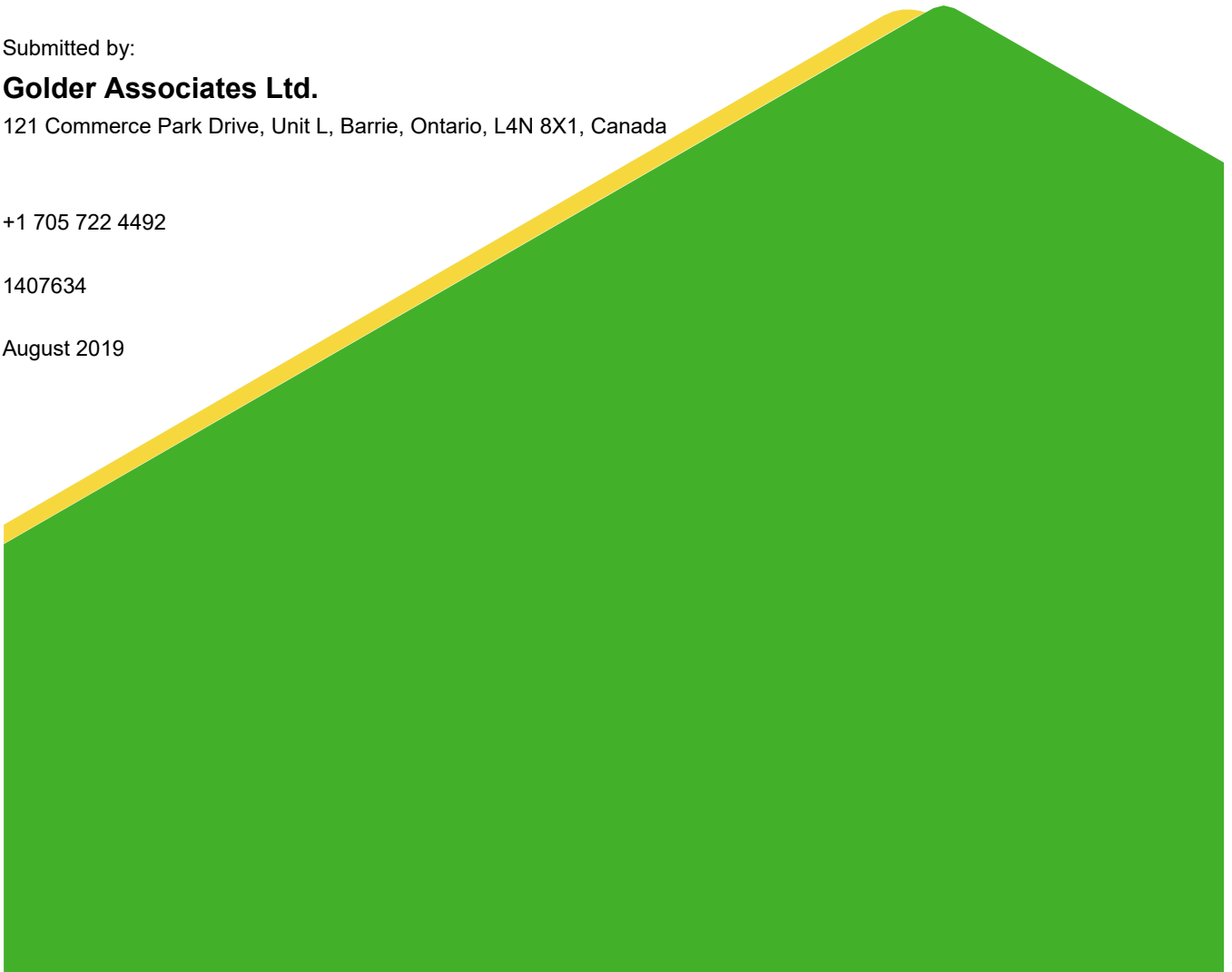
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1407634

August 2019



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APPENDIX A

Appendix A – ECA No. 4731-987KM8

APPENDIX B

Appendix B – Water Quality Data

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare a quarterly compliance report for the McCarthy Quarry located in the Township of Ramara, County of Simcoe (Figure 1). The Environmental Compliance Approval (ECA) No. 4731-987KM8 issued on October 15, 2013 requires this task. A copy of the ECA No. 4731-987KM8 is found in Appendix A.

The following report addresses the requirements described in Sections 7 and 8 of the ECA. Included herein are a brief background, summary and discussion of the sampling results and data collected on-site during each sampling event.

2.0 BACKGROUND

The McCarthy Quarry dewatering system consists of the collection of groundwater and surface water (hereafter referred to as “quarry discharge”) at the base of the quarry floor in a quarry sump which is pumped to a settling pond, at grade, to the south of the active quarry area (Figure 1). The sump is equipped with a 4-inch Grindex pump which is rated at 35 L/sec and is attached to a 4-inch (101 mm) diameter discharge line. Water is pumped from the quarry floor up the quarry face to a 4-inch (101 mm) diameter pipeline that directs the water to the 14,000 m³ settling pond. The water in the settling pond is equipped with a Hickenbottom control structure that discharges the water to the roadside ditch along Concession Road 1. The water flows eastward along the north side of Concession Road 1 to a municipal drain and eventually to the Talbot River, which discharges into Lake Simcoe.

The dewatering activities from the McCarthy Quarry are currently carried out under the existing ECA No. 4731-987KM8 issued on October 15, 2013. Under the current ECA Coco is permitted to pump water from the quarry sump at a rate of 4,545 L/min (76 L/sec).

3.0 QUARRY DISCHARGE MONITORING PLAN

Weekly monitoring of the effluent is required by the ECA at three locations, as shown on Figure 1:

- The outfall of the settling pond (labelled as McCarthy Pond);
- The culvert along Concession Road 1 at the McCarthy property (SW1) downstream of the McCarthy Pond discharge location; and,
- 260 m north of the intersection of Concession Road 1 and the Mara Eldon Boundary Road (labelled as SW2) representing upstream conditions.

Weekly quarry discharge monitoring is required per Section 7(2) for Total Suspended Solids (TSS), Oil and Grease, Phenolics (4AAP) and pH at the McCarthy Pond. Additional water quality sampling is required under Section 7(3) at a semi-annual frequency at all three locations, recognizing that, as of April 24, 2014 this monitoring was reduced from weekly sampling frequency to a semi-annual frequency following one year of quarry operation according to Section 7(7). The parameters required for semi-annual water quality monitoring at all three locations are listed in Table 3 of the ECA. Monthly acute lethality is also required at the McCarthy Pond under Section 8.

As per Section 7(8) an inline flow meter is installed in the discharge line of the sump pump in order to measure continuous flow rates. The flow rates are recorded and provided to Golder by staff at McCarthy Quarry.

The weekly quarry discharge samples (Section 7(2)) were collected by staff at the McCarthy Quarry. The semi-annual water quality samples (Section 7(3) and Section 7(7)) were collected by Golder. Both the weekly and semi-annual water quality samples were sent to Maxxam Analytics Laboratory for analysis. Additionally, the monthly lethality samples were collected by Golder and sent to AGAT Laboratories Ltd.

The weekly water quality sample was not collected from the McCarthy Pond on the week of July 15 to 19, 2019 as there was no quarry discharge at the time of sampling. In addition, the monthly lethality sample was not collected from the McCarthy Pond during the months of June and July 2019 as there was no quarry discharge at the time of sampling.

4.0 QUARRY DISCHARGE MONITORING RESULTS

All laboratory certificates of analysis for the May to August 2019 monitoring period are included in Appendix B. Results of the quarry discharge monitoring are summarized below:

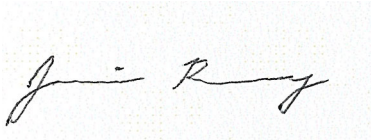
- The TSS, pH, Oil and Grease and Phenol (4AAP) concentrations were all below the daily concentration limits of the ECA (Table 1);
- The TSS, Oil and Grease and Phenol (4AAP) concentrations were all below the monthly concentration limits of the ECA (Table 2);
- The semi-annual surface water sampling results were below the PWQO, with the exception of iron, phenols and phosphorus at SW2 (Table 3);
- The quarry discharge between May and August, 2019 was found to be non-lethal to rainbow trout and *Daphnia magna* (Table 4). Zero rainbow trout and zero *Daphnia* died during lethality testing during the past quarter; and,
- The discharge rate between May and August, 2019 was below the permitted rate of 4,545 L/min (76 L/sec) (Table 5).

5.0 SUMMARY AND RECOMMENDATIONS

All samples met the daily and monthly concentration limits of the ECA No. 4731-987KM8.

Signature Page

Golder Associates Ltd.



Jamie Bonany, M.A.Sc.
Project Scientist



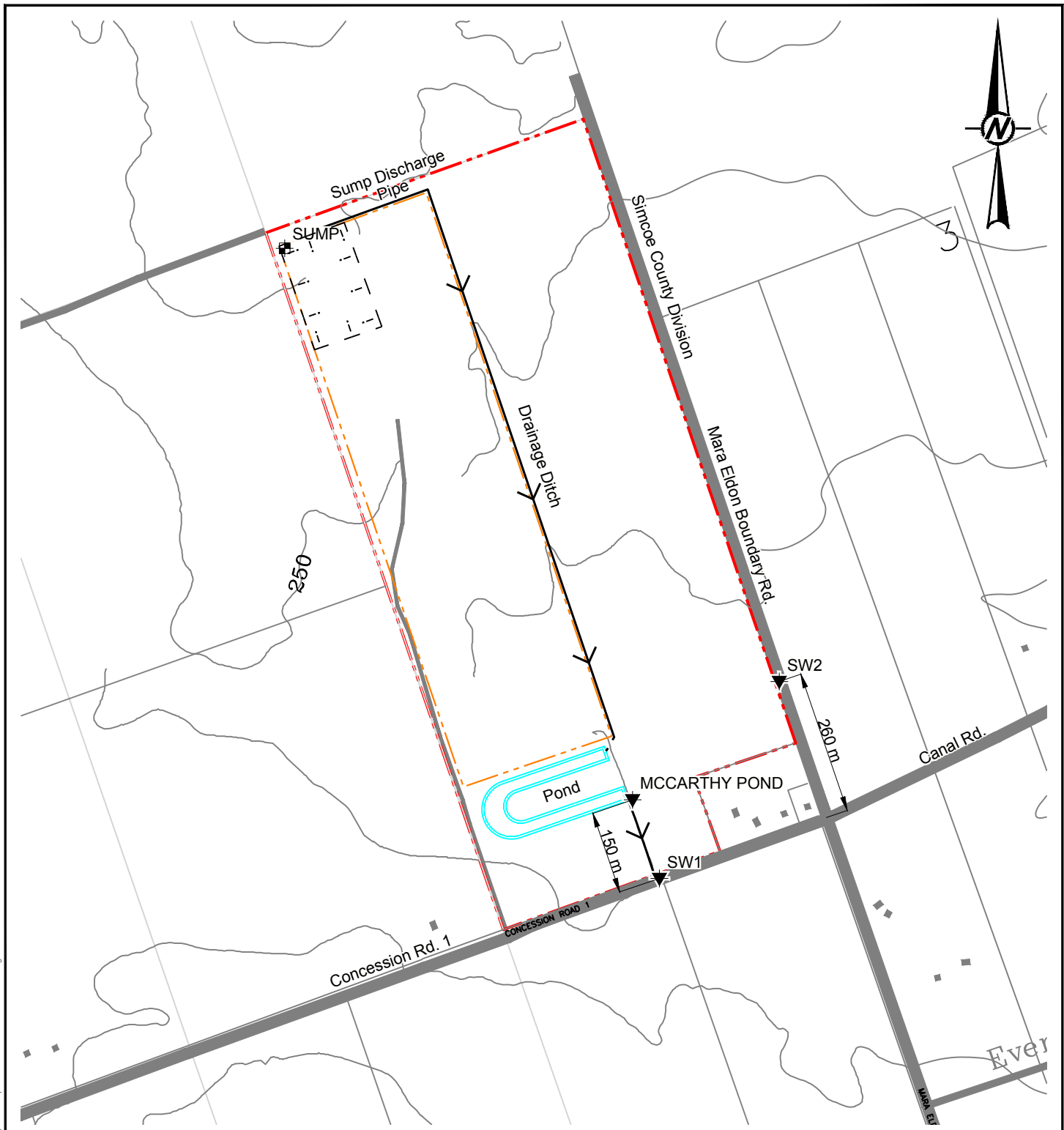
John Easton, M.Sc., P.Geol.
Associate Senior Hydrogeologist

JB/JE/cdr

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Figures



LEGEND

- - - Approximate Property Boundary
- - - Approximate Licenced Boundary
- - - 5 m Contour Line
- ▼ Surface Water Sampling Location
- i i i Approximate Extent of Quarry

REFERENCES AND NOTES

1. Projection UTM NAD83 Zone 17
2. Mapping based on ESRI Geography Network OBM Features and Bing Orthophotos



CLIENT
COCO / QBJR AGGREGATES INC.

PROJECT
STAN MCCARTHY QUARRY

TITLE
LOCATION MAP

CONSULTANT	YYYY-MM-DD	2015-05-14
	PREPARED	STB
	DESIGN	
	REVIEW	
	APPROVED	



PROJECT No. 14-07634 SCALE AS SHOWN Rev. A Figure 1

Path: \\golder\gib\barrie\CAD\Projects\2014\14-07634 (Barrie, Coco Enviro and Hydro)\18AA-1 | File Name: 140763418AA SITE.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A 26 mm

Tables

Table 1: McCarthy Pond Weekly Water Quality Results (May to August 2019)

	Unit	Reportable Detection Limit (RDL)	PWQO ¹	Daily Concentration Limit ²	McCarthy Quarry					
Sample ID					Pond					
Date					02-May-19	09-May-19	16-May-19	23-May-19	30-May-19	06-Jun-19
pH	pH	n/a		6.0-9.5	8.01	8.03	7.93	7.99	7.95	7.79
Total Suspended Solids	mg/L	1		30	4	3	2	2	3	3
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	<0.5	1.3	1.2	<0.5	<0.5
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Daily Concentration Limit; bolded values denote exceedances in the Permit to Take Waters daily concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 1: McCarthy Pond Weekly Water Quality Results (May to August 2019)

	Unit	Reportable Detection Limit (RDL)	PWQO ¹	Daily Concentration Limit ²	McCarthy Quarry					
Sample ID					Pond					
Date					13-Jun-19	20-Jun-19	27-Jun-19	04-Jul-19	11-Jul-19	25-Jul-19
pH	pH	n/a		6.0-9.5	7.75	7.78	7.92	7.94	8.09	8.32
Total Suspended Solids	mg/L	1		30	3	3	4	2	2	3
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	<0.5	1.8	0.9	<0.5	<0.5
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Daily Concentration Limit; bolded values denote exceedances in the Permit to Take Waters daily concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 2: McCarthy Pond Monthly Water Quality Results (May to August 2019)

Sample ID	Unit	Reportable Detection Limit (RDL)	PWQO ¹	Monthly Concentration Limit ²	McCarthy Quarry		
					Pond		
Date					May	June	July
Total Suspended Solids	mg/L	1		15	2.8	3.3	2.3
Total Oil and Grease	mg/L	0.5	Note 3	15	0.8	0.8	0.6
Phenols (4AAP)	mg/L	<0.0010		0.02	<0.001	<0.001	<0.001

Notes

1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.
2. Monthly Concentration Limit; bolded values denote exceedances in the Permit to Take Waters monthly concentration limits.
3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.
4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 3: McCarthy Semi-Annual Water Quality Monitoring Results (May 2019)

Sample ID	Unit	Reportable Detection Limit (RDL)	PWQO ¹	Interim PWQO ²	PTTW Effluent Limits	McCarthy Quarry		
						Pond	SW1	SW2
Date						8-May-19	8-May-19	8-May-19
Field Measured Parameters								
Conductivity	µS/cm					1302	1323	810
pH	pH	n/a	6.5-8.5		6.0-9.5	7.94	8.02	7.38
Temperature	°C	n/a				14.9	16.0	17.1
Calculated Parameters								
Hardness (CaCO ₃)	mg/L	1.0				460	460	410
Inorganics								
Total Ammonia-N	mg/L	0.050				<0.050	<0.050	<0.050
Conductivity	ms/cm	0.001				1.43	1.43	0.859
Total Dissolved Solids	mg/L	10				910	850	500
Fluoride (F ⁻)	mg/L	0.10				0.39	0.37	0.10
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.32	0.24	0.41
Dissolved Organic Carbon	mg/L	0.50				7	5.8	6.8
pH	pH	N/A	6.5-8.5		6.0-9.5	7.98	8.07	7.86
Phenols-4AAP	mg/L	0.0010	0.001		0.04	<0.0010	<0.0010	0.0015
Total Phosphorus	mg/L	0.020		0.02 ^{5b}		0.020	0.019	0.022
Total Suspended Solids	mg/L	10			30	<10	<10	<10
Dissolved Sulphate (SO ₄)	mg/L	1				200	200	47
Alkalinity (Total as CaCO ₃)	mg/L	1.0				210	210	350
Dissolved Chloride (Cl)	mg/L	1				200	200	39
Nitrite (N)	mg/L	0.010				0.050	0.056	<0.010
Nitrate (N)	mg/L	0.10				1.94	2.02	<0.10
Petroleum Hydrocarbons								
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50	<0.50
Metals								
Total Arsenic (As)	ug/L	1	100	5		<1.0	<1.0	<1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5 ^{5d}		<0.10	<0.10	<0.10
Dissolved Calcium (Ca)	mg/L	0.05				140	130	140
Total Calcium (Ca)	ug/L	200				140000	140000	150000
Total Chromium (Cr)	ug/L	5	1-89 ^{5e}			<5.0	<5.0	<5.0
Total Copper (Cu)	ug/L	1	5	1-5 ^{5f}		<1.0	<1.0	<1.0
Total Iron (Fe)	ug/L	100	300			280	210	480
Total Lead (Pb)	ug/L	0.5	5-25 ^{5g}	1-5 ^{5h}		<0.50	<0.50	<0.50
Dissolved Magnesium (Mg)	mg/L	0.05				29	30	18
Total Magnesium (Mg)	ug/L	50				30000	31000	18000
Total Manganese (Mn)	ug/L	2				54	44	95
Total Nickel (Ni)	ug/L	1	25			1.4	1.4	<1.0
Dissolved Potassium (K)	mg/L	1				8.5	8.8	2.9
Total Potassium (K)	ug/L	200				8500	8800	3000
Dissolved Sodium (Na)	mg/L	0.5				130	130	27
Total Sodium (Na)	ug/L	100				130000	130000	28000
Total Zinc (Zn)	ug/L	5	30	20		<5.0	<5.0	<5.0
<p>1. Provincial Water Quality Objectives (PWQO); shaded cells denote PWQO exceedance; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.</p> <p>2. Interim Provincial Water Quality Objectives (Interim PWQO); <i>shaded cells and italics denote Interim PWQO exceedance</i>; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PWQO notes.</p> <p>3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.</p> <p>4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).</p>						<p>5b. <i>Phosphorus (Interim)</i>: - Current scientific evidence is insufficient to develop a firm Objective at this time. - Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies: (a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; (b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; (c) Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.</p>		
<p>5a. <i>Aluminum (Interim)</i>: - At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples. - At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. - At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples. - If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.</p>						<p>5c. <i>Beryllium</i>: If Hardness <75 mg/L (CaCO₃), use 11 ug/L If Hardness >75 mg/L (CaCO₃), use 1100 ug/L</p> <p>5d. <i>Cadmium (Interim)</i>: If Hardness 0-100 mg/L (CaCO₃), then use 0.1 ug/L If Hardness >100 mg/L (CaCO₃), then use 0.5 ug/L</p> <p>5e. <i>Chromium</i>: 1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)</p> <p>5f. <i>Copper (Interim)</i>: If Hardness as CaCO₃ (mg/L) is 0 - 20, then use 1 ug/L If Hardness as CaCO₃ (mg/L) is >20, then use 5 ug/L</p> <p>5g. <i>Lead</i>: If Alkalinity as CaCO₃ (mg/L) is < 20, then use 5 ug/L If Alkalinity as CaCO₃ (mg/L) is 20 to 40, use 10 ug/L If Alkalinity as CaCO₃ (mg/L) is 40 to 80, use 20 ug/L If Alkalinity as CaCO₃ (mg/L) is > 80, use 25 ug/L</p> <p>5h. <i>Lead (Interim)</i>: If Hardness as CaCO₃ (mg/L) is < 30, then use 1 ug/L If Hardness as CaCO₃ (mg/L) is 30 to 80, then use 3 ug/L If Hardness as CaCO₃ (mg/L) is > 80, then use 5 ug/L</p>		

Table 4: Lethality Monitoring at McCarthy Pond

	Unit	Mortality Limit	McCarthy Quarry
Sample ID			Pond
Date			08-May-19
Daphnia Magna	% Mortality Rate*	<50%	0
Rainbow Trout	% Mortality Rate*	<50%	0

* Test results represent acute lethality (100% effluent) of toxicants to Daphnia Magna and Rainbow Trout

Table 5: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					6,550,000	76	4,545
1-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
2-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
3-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
4-May-19	NO PUMP		0	0	-	-	-
5-May-19	NO PUMP		0	0	-	-	-
6-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
8-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
9-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
10-May-19	7AM	3PM	28800	480	1,008,000	35	2,100
11-May-19	7AM	12PM	18000	300	630,000	35	2,100
12-May-19	NO PUMP		0	0	-	-	-
13-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
14-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
15-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
16-May-19	10AM	3PM	18000	300	630,000	35	2,100
17-May-19	7AM	1PM	21600	360	756,000	35	2,100
18-May-19	NO PUMP		0	0	-	-	-
19-May-19	NO PUMP		0	0	-	-	-
20-May-19	NO PUMP		0	0	-	-	-
21-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
22-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
23-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
24-May-19	7AM	2PM	25200	420	882,000	35	2,100
25-May-19	NO PUMP		0	0	-	-	-
26-May-19	NO PUMP		0	0	-	-	-
27-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
28-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
29-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
30-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
31-May-19	7AM	5PM	36000	600	1,260,000	35	2,100
1-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
2-Jun-19	NO PUMP		0	0	-	-	-
3-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
4-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
6-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
7-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100

Table 5: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					6,550,000	76	4,545
8-Jun-19	NO PUMP		0	0	-	-	-
9-Jun-19	NO PUMP		0	0	-	-	-
10-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
11-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
13-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
14-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
15-Jun-19	7AM	12PM	18000	300	630,000	35	2,100
16-Jun-19	NO PUMP		0	0	-	-	-
17-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
18-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
19-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
20-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
21-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
22-Jun-19	7AM	1PM	21600	360	756,000	35	2,100
23-Jun-19	NO PUMP		0	0	-	-	-
24-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
25-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
26-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
27-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jun-19	7AM	5PM	36000	600	1,260,000	35	2,100
29-Jun-19	7AM	2PM	25200	420	882,000	35	2,100
30-Jun-19	NO PUMP		0	0	-	-	-
1-Jul-19	NO PUMP		0	0	-	-	-
2-Jul-19	7AM	5PM	36000	600	1,260,000	35	2,100
3-Jul-19	NO PUMP		0	0	-	-	-
4-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
5-Jul-19	12PM	5PM	18000	300	630,000	35	2,100
6-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
7-Jul-19	NO PUMP		0	0	-	-	-
8-Jul-19	7AM	2PM	25200	420	882,000	35	2,100
9-Jul-19	7AM	5PM	36000	600	1,260,000	35	2,100
10-Jul-19	NO PUMP		0	0	-	-	-
11-Jul-19	NO PUMP		0	0	-	-	-
12-Jul-19	NO PUMP		0	0	-	-	-
13-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
14-Jul-19	NO PUMP		0	0	-	-	-

Table 5: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					6,550,000	76	4,545
15-Jul-19	1PM	5PM	14400	240	504,000	35	2,100
16-Jul-19	NO PUMP		0	0	-	-	-
17-Jul-19	NO PUMP		0	0	-	-	-
18-Jul-19	NO PUMP		0	0	-	-	-
19-Jul-19	7AM	12PM	18000	300	630,000	35	2,100
20-Jul-19	7AM	11AM	14400	240	504,000	35	2,100
21-Jul-19	NO PUMP		0	0	-	-	-
22-Jul-19	NO PUMP		0	0	-	-	-
23-Jul-19	NO PUMP		0	0	-	-	-
24-Jul-19	NO PUMP		0	0	-	-	-
25-Jul-19	NO PUMP		0	0	-	-	-
26-Jul-19	NO PUMP		0	0	-	-	-
27-Jul-19	NO PUMP		0	0	-	-	-
28-Jul-19	NO PUMP		0	0	-	-	-
29-Jul-19	NO PUMP		0	0	-	-	-
30-Jul-19	NO PUMP		0	0	-	-	-
31-Jul-19	NO PUMP		0	0	-	-	-

APPENDIX A

**Appendix A – ECA No. 4731-
987KM8**



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- GA

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4731-987KM8

Issue Date: October 15, 2013

QBJR Aggregates Inc.
949 Wilson Ave
Toronto, Ontario, M3K 1G2

Site Location: McCarthy Quarry
Lot 1, Concession 1, Original Township of Mara
Lot 1, Concession 1
Ramara Township, County of Simcoe, L0K 1B0

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

a sewage works for the collection, transmission, treatment and disposal of quarry water effluent from an aggregate quarry consisting of the following:

- one (1) sump, measuring 20 metres long, 10 metres wide and 3 metres deep, located at the base of the quarry floor, equipped with two (2) submersible pumps each rated at 38 litres per second with a suction intake approximately one (1) metre above the bottom of the sump, discharging to a settling pond via a 203 millimetre diameter pipeline;
- one (1) horse-shoe shaped settling pond with an approximate volume of 14,000 cubic metres (at elevation 248.2 metres), with a Hickenbottom control structure equipped with a 150 millimetre diameter orifice plate, discharging to the roadside ditch along Concession Road 1 with ultimate discharge to the Talbot River via a private ditch;
- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with supporting documents listed in **Schedule A**.

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

"Approval" means this entire document and any schedules attached to it, and the application;

"Director" means a person appointed by the Minister pursuant to section 5 of the *EPA* for the purposes of Part II.1 of the *EPA*;

"District Manager" means the District Manager of the Barrie District Office of the Ministry;

"EPA" means the Environmental Protection Act, R.S.O. 1990, c.E.19, as amended;

"Ministry" means the ministry of the government of Ontario responsible for the *EPA* and *OWRA* and includes all officials, employees or other persons acting on its behalf;

"Owner" means QBJR Aggregates Inc. and its successors and assignees;

"OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O.40, as amended;

"Quarterly" means all or part of a period of three consecutive months beginning on the first day of January, April, July or October;

"Semi-annually" means all or part of a period of six months beginning on the first day of January or July;

"Weekly" means a period of seven days, starting on Sunday and ending on Saturday; and

"Works" means the sewage works described in the Owner's application, this *Approval* and in the supporting documentation referred to herein, to the extent approved by this *Approval* .

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

TERMS AND CONDITIONS

1. GENERAL CONDITION

(1) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Approval* , the application for approval of the *Works* and the submitted supporting documents and plans and specifications as listed in this *Approval* .

(2) Where there is a conflict between a provision of any submitted document referred to in this *Approval* and the Conditions of this *Approval* , the Conditions in this *Approval* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

2. CHANGE OF OWNER

(1) The *Owner* shall notify the *District Manager* and the *Director* , in writing, of any of the following changes within seven (7) days of the change occurring:

(a) change of *Owner* or operating authority, or both;

(b) change of address of *Owner* or operating authority or address of new owner or operating authority;

(c) change of partners where the *Owner* or operating authority is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Partnerships Registration Act* ;

(d) change of name of the corporation where the *Owner* or operator is or at any time becomes a corporation, and a copy of the most current "Initial Notice or Notice of Change" (Form 1, 2 or 3 of O. Reg. 189, R.R.O. 1980, as amended from time to time), filed under the *Corporations Informations Act* shall be included in the notification to the *District Manager* ;

(2) In the event of any change in ownership of the *Works* , the *Owner* shall notify in writing the succeeding owner of the existence of this certificate, and a copy of such notice shall be forwarded to the *District Manager* .

(3) The *Owner* shall ensure that all communications made pursuant to this condition will refer to this Approval's number.

3. CHANGES IN PROCESSES OR PROCESS MATERIALS

The *Owner* shall give written notice to the *District Manager* of any plans to change the processes or process materials in the *Owner's* enterprise serviced by the *Works* where the change may significantly alter the quantity or quality of the influent to or effluent from the *Works* , and no such changes shall be made unless with the written concurrence or approval of the *District Manager* .

4. OPERATIONS MANUAL

(1) The *Owner* shall prepare an operations manual prior to the commencement of operation of the sewage *Works* , that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the *Works* ;

(b) inspection programs, including frequency of inspection, for the *Works* and the methods or tests employed to detect when maintenance is necessary;

(c) repair and maintenance programs, including the frequency of repair and maintenance for the *Works* ;

(d) contingency plans and procedures for dealing with potential spill, bypasses and any other abnormal situations and for notifying the *District Manager* ; and

(e) complaint procedures for receiving and responding to public complaints.

(2) The *Owner* shall maintain the operations manual up to date through revisions undertaken from time to time and retain a copy at the location of the sewage works. Upon request, the *Owner* shall make the manual available for inspection and copying by Ministry personnel.

(3) A copy of the operations manual required by subsection (1) shall be provided to the *Director* no later than **three (3) months** prior to the commencement of operation of the sewage works.

5. EFFLUENT LIMITS

(1) The *Owner* shall design, construct and operate the *Works* such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the *Works* .

Effluent Parameter	Daily Concentration Limit (mg/L)	Monthly Average Concentration Limit (mg/L)
Column 1	Column 2	Column 3
Total Suspended Solids	30	15
Oil and Grease	30	15
Phenolics (4AAP)	0.04	0.02

(2) pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times.

(3) The *Owner* shall ensure that the quarry water effluent shall be non-lethal to rainbow trout and *Daphnia magna* at all times.

(4) For the purposes of determining compliance with and enforcing subsection (1), exceedance of a daily concentration is deemed to have occurred when any daily single grab sample, analyzed for a parameter named in Column 1 of Table 1, is greater than the corresponding daily concentration set in Column 2 of Table 1.

(5) For the purposes of determining compliance with and enforcing subsection (1), exceedance of a monthly average concentration is deemed to have occurred when the arithmetic mean concentration of all samples taken in a calendar month, analyzed for a parameter named in Column 1 of Table 1, is greater than the corresponding monthly average concentration set in Column 3 of Table 1.

(6) Non-compliance with respect to pH is deemed to have occurred when any single measurement is outside of the indicated range.

(7) For the purposes of determining compliance with and enforcing subsection (3), the effluent is deemed to be non-lethal if the test results, required pursuant to Condition 8, show mortality for no more than 50 percent of either test organism in each sample of undiluted effluent.

6. EFFLUENT - VISUAL OBSERVATIONS

Notwithstanding any other condition in this *Approval* the *Owner* shall ensure that the effluent from the *Works* is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film, sheen or foam on the receiving waters.

7. EFFLUENT MONITORING AND RECORDING

The *Owner* shall, upon commencement of operation of the sewage works, carry out the following sampling from the final effluent control point (i.e. the outfall of the settling pond which is approximately 150 metres north of Concession 1) at the commencement of effluent discharge and for the duration of the discharge period, as follows:

(1) All samples and measurements taken for the purposes of this *Approval* are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) Samples shall be collected and analyzed at the following sampling point, at the sampling frequencies and using the sample type specified for each parameter listed:

Effluent Parameter	Frequency	Sample Type
Total Suspended Solids	Weekly	Grab
Oil and Grease	Weekly	Grab
Phenolics (4AAP)	Weekly	Grab

(3) The *Owner* shall collect effluent samples at the following locations and analyze for the parameters listed in Table 3 at a frequency of once per week:

- (a) Outfall of settling pond approximately 150 metres north of Concession 1 (i.e. end of pipe discharge);
- (b) Box culvert on Eldon-Ramara Townline approximately 260 metres north of intersection of Ramara Concession 1 and Eldon-Ramara Townline (i.e. upgradient of end of pipe discharge);

- (c) 80 centimetre CSP located at Concession 1 Road on McCarthy property (i.e. downgradient of end of pipe discharge).

Table 3 - Effluent and Surface Water Monitoring	
Frequency	Weekly
Sample Type	Grab
Parameters	Total Suspended Solids, Copper, Lead, Nickel, Zinc, Arsenic, Oil and Grease, Phenolics (4AAP), Hardness (as CaCO ₃), Alkalinity(as CaCO ₃), Conductivity, pH, Fluoride, Chloride, Nitrate (N), Nitrite (N), Sulphate, Calcium, Magnesium, Sodium, Potassium, Ammonia (N), Dissolved Organic Carbon, Iron, Total Kjeldahl Nitrogen, Phosphorus (Total), Cadmium, Chromium, Manganese, Anion (Sum), Cation (Sum) and Total Dissolved Solids

- (4) There shall be at least **four days** between successive sampling.
- (5) The methods and protocols for sampling, analysis, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:
- (a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;
 - (b) the publication "Standard Methods for the Examination of Water and Wastewater" (17th edition) as amended from time to time by more recently published editions; and,
 - (c) in respect of any parameters not mentioned in (a) and (b), the written approval of the *District Manager* , shall be obtained prior to sampling.
- (6) The measurement frequencies specified in subsection (2) in respect of any parameter are minimum requirements which may, **after 48 months** of monitoring in accordance with this Condition, be modified by the *District Manager* in writing from time to time.
- (7) The measurement frequencies specified in subsection (3) in respect of any parameter shall be changed to semi-annually after one year of quarry operation.
- (8) A continuous flow measuring device shall be installed and maintained to measure the flowrate of the effluent from the sewage works, with an accuracy to within plus or minus 15 per cent of the actual flowrate for the entire design range of the flow measuring device and the *Owner* shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.
- (9) The *Owner* shall retain for a minimum of **three (3) years** from the date of their creation, all records

and information related to or resulting from the monitoring activities required by this *Approval* .

8. LETHALITY MONITORING

(1) The *Owner* shall perform rainbow trout acute lethality test and *Daphnia magna* acute lethality test at least once a month on the quarry water effluent according to procedures published in Environment Canada publications entitled "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout", dated July 1990 and "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* ", dated July 1990 and as updated from time to time.

(2) The acute lethality tests shall be carried out on a grab sample as a single concentration test using 100 per cent quarry water effluent.

(3) A minimum of two samples shall be tested for either test animal per each discharge period.

9. RECEIVER INSPECTION

The *Owner* shall, at least once per year, undertake a visual inspection of the downstream ditches for evidence of erosion and/or flooding and shall report the observations in the annual report.

10. REPORTING

(1) One week prior to the start up of the operation of the *Works* , the *Owner* shall notify the *District Manager* (in writing) of the pending start up date.

(2) The *Owner* shall report to the *District Manager* or designate, any exceedance of any parameter specified in Condition 5 orally, forthwith, and in writing within seven (7) days of the exceedance.

(3) In addition to the obligations under Part X of the *Environmental Protection Act* , the *Owner* shall, within 10 working days of the occurrence of any spill, bypass or loss of any product, by product, intermediate product, oils, solvents, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the *District Manager* describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

(4) The *Owner* shall submit quarterly reports of the information obtained under Conditions 7 and 8 within 30 days of the end of each quarter.

(5) The *Owner* shall prepare and submit a performance report to the *District Manager* on an annual basis within sixty (60) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the *Works* and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

- (a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage works;
- (b) a description of any operating problems encountered and corrective actions taken;
- (c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;
- (d) a summary of any effluent quality assurance or control measures undertaken in the reporting period; and
- (e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment.

Schedule A

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Approval of Industrial Sewage Works submitted by Thomas S. McCarthy dated July 21, 2001 and revised January 25, 2002;
2. McCarthy Property - Certificate of Approval Application prepared by Dixon Hydrogeology Limited dated July 2001;
3. Revised Permit to Take Water - McCarthy Property prepared by Dixon Hydrogeology Limited dated April 11, 2002;
4. Letter and attachments dated January 25, 2002 from John Easton of Dixon Hydrogeology Limited to Mohamed Dhalla of the Ministry of the Environment;
5. Letter and attachments dated April 1, 2002 from Dave Hulme of Dave T. Hulme Enterprises Inc. to Stefanos Habtom of the Ministry of the Environment;
6. Letter dated April 10, 2002 from John Easton of Dixon Hydrogeology Limited to Stefanos Habtom of the Ministry of the Environment;
7. Environmental Review Amended Tribunal Decision: 02-214/02-217 and 03-188/03-189, dated May 25, 2006 - Trent Talbot River Property Owners Association, Marchand Lamarre and Jodi McIntosh v. Director, Ministry of the Environment; and
8. Notification of Change of Address/Ownership dated June 29, 2012, MOE Reference Number 3620-8VQPTZ acknowledging change in company address/ownership from Thomas S. McCarty, Rural Route No.1 Brechin, Ontario, L0K 1B0 to QBJR Aggregates Inc., 949 Wilson Ave., Toronto, Ontario, M3K 1G.

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

Pursuant to subsection 139(3) of the Environmental Protection Act, a hearing may not be required with respect to any terms and conditions in this environmental compliance approval, if the terms and conditions are substantially the same as those contained in an approval that is amended or revoked by this environmental compliance approval.

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

* Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca

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

DATED AT TORONTO this 15th day of October, 2013



Edgardo Tovilla
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

APPENDIX B

Appendix B – Water Quality Data

Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: C#590331-11-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/10
 Report #: R5705327
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B7735
Received: 2019/05/03, 09:40

Sample Matrix: Air
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/08	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/06	2019/05/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/07	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/08	2019/05/08	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/06	2019/05/07	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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

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

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

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

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

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

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: C#590331-11-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/10
Report #: R5705327
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9B7735
Received: 2019/05/03, 09:40

Encryption Key

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

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF AIR

Maxxam ID		JPR036		
Sampling Date		2019/05/02 13:17		
COC Number		C#590331-11-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6104058
Inorganics				
pH	pH	8.01	N/A	6106202
Phenols-4AAP	mg/L	<0.0010	0.0010	6105336
Total Suspended Solids	mg/L	4	1	6105360
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6110253
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6110256
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

GENERAL COMMENTS

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

Package 1	15.0°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6105336	BMO	Matrix Spike	Phenols-4AAP	2019/05/07		93	%	80 - 120
6105336	BMO	Spiked Blank	Phenols-4AAP	2019/05/07		96	%	80 - 120
6105336	BMO	Method Blank	Phenols-4AAP	2019/05/07	<0.0010		mg/L	
6105336	BMO	RPD	Phenols-4AAP	2019/05/07	NC		%	20
6105360	MKX	QC Standard	Total Suspended Solids	2019/05/07		95	%	85 - 115
6105360	MKX	Method Blank	Total Suspended Solids	2019/05/07	<1		mg/L	
6105360	MKX	RPD	Total Suspended Solids	2019/05/07	NC		%	25
6106202	SAU	Spiked Blank	pH	2019/05/07		102	%	98 - 103
6106202	SAU	RPD	pH	2019/05/07	0.17		%	N/A
6110253	SPK	Spiked Blank	Total Oil & Grease	2019/05/08		100	%	85 - 115
6110253	SPK	RPD	Total Oil & Grease	2019/05/08	3.1		%	25
6110253	SPK	Method Blank	Total Oil & Grease	2019/05/08	<0.50		mg/L	
6110256	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/08		96	%	85 - 115
6110256	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/08	3.7		%	25
6110256	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/08	<0.50		mg/L	

N/A = Not Applicable

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

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

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

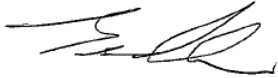
Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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

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).

VALIDATION SIGNATURE PAGE

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



Brad Newman, Scientific Service Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Your Project #: 1407634
 Site Location: McCarthy
 Your C.O.C. #: 679275-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/17
 Report #: R5715095
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5096
Received: 2019/05/10, 08:57

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/15	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/13	2019/05/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/13	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/15	2019/05/15	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/11	2019/05/13	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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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.

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

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679275-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715095
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5096
Received: 2019/05/10, 08:57

Encryption Key

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

=====

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF ANALYSES OF WATER

Maxxam ID			JRH069		
Sampling Date			2019/05/09 15:12		
COC Number			679275-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6115318
Inorganics					
pH	pH	6.5:8.5	8.03	N/A	6119176
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6118008
Total Suspended Solids	mg/L	-	3	1	6117316
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6122647
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6122664
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					

GENERAL COMMENTS

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

Package 1	16.0°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6117316	MKX	QC Standard	Total Suspended Solids	2019/05/13		98	%	85 - 115
6117316	MKX	Method Blank	Total Suspended Solids	2019/05/13	<1		mg/L	
6117316	MKX	RPD	Total Suspended Solids	2019/05/13	11		%	25
6118008	BMO	Matrix Spike	Phenols-4AAP	2019/05/14		94	%	80 - 120
6118008	BMO	Spiked Blank	Phenols-4AAP	2019/05/13		96	%	80 - 120
6118008	BMO	Method Blank	Phenols-4AAP	2019/05/13	<0.0010		mg/L	
6118008	BMO	RPD	Phenols-4AAP	2019/05/14	NC (1)		%	20
6119176	GTO	Spiked Blank	pH	2019/05/14		100	%	98 - 103
6119176	GTO	RPD	pH	2019/05/14	0.030		%	N/A
6122647	FA	Spiked Blank	Total Oil & Grease	2019/05/15		94	%	85 - 115
6122647	FA	RPD	Total Oil & Grease	2019/05/15	2.6		%	25
6122647	FA	Method Blank	Total Oil & Grease	2019/05/15	<0.50		mg/L	
6122664	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/15		91	%	85 - 115
6122664	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/15	3.8		%	25
6122664	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/15	<0.50		mg/L	

N/A = Not Applicable

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

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

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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.

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

(1) Detection Limit was raised due to matrix interferences.

VALIDATION SIGNATURE PAGE

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

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

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Your Project #: 1407634
 Site Location: McCarthy
 Your C.O.C. #: 679280-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/24
 Report #: R5724456
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D2606
Received: 2019/05/17, 09:18

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/24	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/18	2019/05/21	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/23	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/24	2019/05/24	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/22	2019/05/23	CAM SOP-00428	SM 23 2540D m

Remarks:

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

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679280-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/24
Report #: R5724456
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D2606
Received: 2019/05/17, 09:18

Encryption Key

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

=====

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RESULTS OF ANALYSES OF WATER

Maxxam ID			JTA364		
Sampling Date			2019/05/16 13:20		
COC Number			679280-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.3	0.50	6127422
Inorganics					
pH	pH	6.5:8.5	7.93	N/A	6129742
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6130911
Total Suspended Solids	mg/L	-	2	1	6133311
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	1.3	0.50	6138123
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6138131
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					

GENERAL COMMENTS

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

Package 1	16.0°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6129742	GTO	Spiked Blank	pH	2019/05/21		100	%	98 - 103
6129742	GTO	RPD	pH	2019/05/21	0.47		%	N/A
6130911	BMO	Matrix Spike	Phenols-4AAP	2019/05/23		97	%	80 - 120
6130911	BMO	Spiked Blank	Phenols-4AAP	2019/05/23		101	%	80 - 120
6130911	BMO	Method Blank	Phenols-4AAP	2019/05/23	<0.0010		mg/L	
6130911	BMO	RPD	Phenols-4AAP	2019/05/23	NC		%	20
6133311	XH1	QC Standard	Total Suspended Solids	2019/05/23		97	%	85 - 115
6133311	XH1	Method Blank	Total Suspended Solids	2019/05/23	<1		mg/L	
6133311	XH1	RPD	Total Suspended Solids	2019/05/23	4.7		%	25
6138123	FA	Spiked Blank	Total Oil & Grease	2019/05/24		99	%	85 - 115
6138123	FA	RPD	Total Oil & Grease	2019/05/24	4.1		%	25
6138123	FA	Method Blank	Total Oil & Grease	2019/05/24	<0.50		mg/L	
6138131	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/24		95	%	85 - 115
6138131	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/24	3.2		%	25
6138131	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/24	<0.50		mg/L	

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

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

VALIDATION SIGNATURE PAGE

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Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
 Site Location: McCarthy
 Your C.O.C. #: 679279-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/30
 Report #: R5732752
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D9071
Received: 2019/05/24, 09:14

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/05/30	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/05/25	2019/05/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/05/27	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/05/30	2019/05/30	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/05/27	2019/05/28	CAM SOP-00428	SM 23 2540D m

Remarks:

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(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Site Location: McCarthy
Your C.O.C. #: 679279-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/05/30
Report #: R5732752
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9D9071
Received: 2019/05/24, 09:14

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Ema Gitej, Senior Project Manager
Email: EGitej@maxxam.ca
Phone# (905)817-5829

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RESULTS OF ANALYSES OF WATER

Maxxam ID			JUM725		JUM725	
Sampling Date			2019/05/23 14:20		2019/05/23 14:20	
COC Number			679279-01-01		679279-01-01	
	UNITS	Criteria	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	1.2	0.50	N/A	6138976
Inorganics						
pH	pH	6.5:8.5	7.99	N/A	8.05	6140695
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	N/A	6141759
Total Suspended Solids	mg/L	-	2	1	N/A	6141112
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	-	1.2	0.50	N/A	6149136
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	N/A	6149145
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable						

GENERAL COMMENTS

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

Package 1	16.0°C
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Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6140695	NYS	Spiked Blank	pH	2019/05/25		102	%	98 - 103
6140695	NYS	RPD [JUM725-02]	pH	2019/05/25	0.73		%	N/A
6141112	NB3	QC Standard	Total Suspended Solids	2019/05/28		99	%	85 - 115
6141112	NB3	Method Blank	Total Suspended Solids	2019/05/28	<1		mg/L	
6141112	NB3	RPD	Total Suspended Solids	2019/05/28	0		%	25
6141759	BMO	Matrix Spike	Phenols-4AAP	2019/05/27		93	%	80 - 120
6141759	BMO	Spiked Blank	Phenols-4AAP	2019/05/27		94	%	80 - 120
6141759	BMO	Method Blank	Phenols-4AAP	2019/05/27	<0.0010		mg/L	
6141759	BMO	RPD	Phenols-4AAP	2019/05/27	NC		%	20
6149136	FA	Spiked Blank	Total Oil & Grease	2019/05/30		94	%	85 - 115
6149136	FA	RPD	Total Oil & Grease	2019/05/30	5.0		%	25
6149136	FA	Method Blank	Total Oil & Grease	2019/05/30	<0.50		mg/L	
6149145	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/05/30		92	%	85 - 115
6149145	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/05/30	3.2		%	25
6149145	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/05/30	<0.50		mg/L	

N/A = Not Applicable

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

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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.

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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).

VALIDATION SIGNATURE PAGE

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Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 686266-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/07
 Report #: R5743319
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E6674

Received: 2019/05/31, 08:51

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/06	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/01	2019/06/03	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/03	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/06	2019/06/06	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/01	2019/06/03	CAM SOP-00428	SM 23 2540D m

Remarks:

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(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/07
Report #: R5743319
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9E6674
Received: 2019/05/31, 08:51

Encryption Key

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

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RESULTS OF ANALYSES OF WATER

BV Labs ID			JWE236		
Sampling Date			2019/05/30 13:07		
COC Number			686266-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6151585
Inorganics					
pH	pH	6.5:8.5	7.95	N/A	6153857
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6154480
Total Suspended Solids	mg/L	-	3	1	6153484
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6162041
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6162045
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9E6674
Report Date: 2019/06/07

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SB

GENERAL COMMENTS

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

Package 1	16.7°C
-----------	--------

Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9E6674
Report Date: 2019/06/07

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6153484	XH1	QC Standard	Total Suspended Solids	2019/06/03		95	%	85 - 115
6153484	XH1	Method Blank	Total Suspended Solids	2019/06/03	<1		mg/L	
6153484	XH1	RPD	Total Suspended Solids	2019/06/03	NC		%	25
6153857	GTO	Spiked Blank	pH	2019/06/03		100	%	98 - 103
6153857	GTO	RPD	pH	2019/06/03	0.056		%	N/A
6154480	BMO	Matrix Spike	Phenols-4AAP	2019/06/03		98	%	80 - 120
6154480	BMO	Spiked Blank	Phenols-4AAP	2019/06/03		95	%	80 - 120
6154480	BMO	Method Blank	Phenols-4AAP	2019/06/03	<0.0010		mg/L	
6154480	BMO	RPD	Phenols-4AAP	2019/06/03	NC		%	20
6162041	MA4	Spiked Blank	Total Oil & Grease	2019/06/06		97	%	85 - 115
6162041	MA4	RPD	Total Oil & Grease	2019/06/06	3.4		%	25
6162041	MA4	Method Blank	Total Oil & Grease	2019/06/06	<0.50		mg/L	
6162045	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/06		91	%	85 - 115
6162045	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/06	5.3		%	25
6162045	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/06	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9E6674
Report Date: 2019/06/07

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SB

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read "Brad Newman", written over a horizontal line.

Brad Newman, Scientific Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 686266-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/13
 Report #: R5752402
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F4678

Received: 2019/06/07, 09:02

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/12	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/08	2019/06/10	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/10	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/12	2019/06/12	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/10	2019/06/11	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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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 BV Labs, results relate to the supplied samples tested.

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

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

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

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/13
Report #: R5752402
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9F4678
Received: 2019/06/07, 09:02

Encryption Key

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

=====

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RESULTS OF ANALYSES OF WATER

BV Labs ID			JXX391		
Sampling Date			2019/06/06 12:04		
COC Number			686266-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6165913
Inorganics					
pH	pH	6.5:8.5	7.79	N/A	6166520
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6167307
Total Suspended Solids	mg/L	-	3	1	6168585
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6172452
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6172461
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9F4678
Report Date: 2019/06/13

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: GW

GENERAL COMMENTS

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

Package 1	21.0°C
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Results relate only to the items tested.



QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6166520	NYS	Spiked Blank	pH	2019/06/10		102	%	98 - 103
6166520	NYS	RPD	pH	2019/06/10	0.057		%	N/A
6167307	BMO	Matrix Spike	Phenols-4AAP	2019/06/10		97	%	80 - 120
6167307	BMO	Spiked Blank	Phenols-4AAP	2019/06/10		102	%	80 - 120
6167307	BMO	Method Blank	Phenols-4AAP	2019/06/10	<0.0010		mg/L	
6167307	BMO	RPD	Phenols-4AAP	2019/06/10	0		%	20
6168585	MKX	QC Standard	Total Suspended Solids	2019/06/11		100	%	85 - 115
6168585	MKX	Method Blank	Total Suspended Solids	2019/06/11	<1		mg/L	
6168585	MKX	RPD	Total Suspended Solids	2019/06/11	NC		%	25
6172452	MA4	Spiked Blank	Total Oil & Grease	2019/06/12		95	%	85 - 115
6172452	MA4	RPD	Total Oil & Grease	2019/06/12	2.6		%	25
6172452	MA4	Method Blank	Total Oil & Grease	2019/06/12	<0.50		mg/L	
6172461	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/12		92	%	85 - 115
6172461	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/12	4.3		%	25
6172461	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/12	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9F4678
Report Date: 2019/06/13

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: GW

VALIDATION SIGNATURE PAGE

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

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Brad Newman, Scientific Service Specialist

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Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 686266-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/20
 Report #: R5763202
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9G2527

Received: 2019/06/14, 08:46

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/19	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/15	2019/06/17	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/17	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/19	2019/06/19	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/15	2019/06/17	CAM SOP-00428	SM 23 2540D m

Remarks:

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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 BV Labs, 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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/20
Report #: R5763202
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9G2527
Received: 2019/06/14, 08:46

Encryption Key

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

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RESULTS OF ANALYSES OF WATER

BV Labs ID			JZQ920		
Sampling Date			2019/06/13 10:27		
COC Number			686266-02-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6177033
Inorganics					
pH	pH	6.5:8.5	7.75	N/A	6179021
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6179945
Total Suspended Solids	mg/L	-	3	1	6179399
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6185105
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6185113
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9G2527

Report Date: 2019/06/20

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: KC

GENERAL COMMENTS

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

Package 1	16.0°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9G2527
Report Date: 2019/06/20

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: KC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6179021	SAU	Spiked Blank	pH	2019/06/17		102	%	98 - 103
6179021	SAU	RPD	pH	2019/06/17	2.3		%	N/A
6179399	MKX	QC Standard	Total Suspended Solids	2019/06/17		101	%	85 - 115
6179399	MKX	Method Blank	Total Suspended Solids	2019/06/17	<1		mg/L	
6179399	MKX	RPD	Total Suspended Solids	2019/06/17	NC		%	25
6179945	BMO	Matrix Spike	Phenols-4AAP	2019/06/17		97	%	80 - 120
6179945	BMO	Spiked Blank	Phenols-4AAP	2019/06/17		98	%	80 - 120
6179945	BMO	Method Blank	Phenols-4AAP	2019/06/17	<0.0010		mg/L	
6179945	BMO	RPD	Phenols-4AAP	2019/06/17	0		%	20
6185105	MA4	Spiked Blank	Total Oil & Grease	2019/06/19		98	%	85 - 115
6185105	MA4	RPD	Total Oil & Grease	2019/06/19	3.1		%	25
6185105	MA4	Method Blank	Total Oil & Grease	2019/06/19	<0.50		mg/L	
6185113	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/19		96	%	85 - 115
6185113	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/19	2.1		%	25
6185113	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/19	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9G2527

Report Date: 2019/06/20

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: KC

VALIDATION SIGNATURE PAGE

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

Eva Pranjić

Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

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Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 590331-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/27
 Report #: R5774102
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H0731

Received: 2019/06/21, 09:25

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/06/26	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/22	2019/06/24	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/06/24	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/06/26	2019/06/26	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/22	2019/06/24	CAM SOP-00428	SM 23 2540D m

Remarks:

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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 BV Labs, 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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 590331-05-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/06/27
Report #: R5774102
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H0731
Received: 2019/06/21, 09:25

Encryption Key

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

=====

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BUREAU
VERITAS

BV Labs Job #: B9H0731
Report Date: 2019/06/27

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SB

RESULTS OF ANALYSES OF WATER

BV Labs ID		KBO215		
Sampling Date		2019/06/20 10:34		
COC Number		590331-05-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	6191391
Inorganics				
pH	pH	7.78	N/A	6192425
Phenols-4AAP	mg/L	<0.0010	0.0010	6192818
Total Suspended Solids	mg/L	3	1	6192349
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	6197677
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	6197682
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				



BUREAU
VERITAS

BV Labs Job #: B9H0731

Report Date: 2019/06/27

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: SB

GENERAL COMMENTS

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

Package 1	21.0°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9H0731
Report Date: 2019/06/27

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6192349	XH1	QC Standard	Total Suspended Solids	2019/06/24		96	%	85 - 115
6192349	XH1	Method Blank	Total Suspended Solids	2019/06/24	<1		mg/L	
6192349	XH1	RPD	Total Suspended Solids	2019/06/24	NC		%	25
6192425	SAU	Spiked Blank	pH	2019/06/24		102	%	98 - 103
6192425	SAU	RPD	pH	2019/06/24	0.30		%	N/A
6192818	LHA	Matrix Spike	Phenols-4AAP	2019/06/24		94	%	80 - 120
6192818	LHA	Spiked Blank	Phenols-4AAP	2019/06/24		96	%	80 - 120
6192818	LHA	Method Blank	Phenols-4AAP	2019/06/24	<0.0010		mg/L	
6192818	LHA	RPD	Phenols-4AAP	2019/06/24	5.7		%	20
6197677	MA4	Spiked Blank	Total Oil & Grease	2019/06/26		99	%	85 - 115
6197677	MA4	RPD	Total Oil & Grease	2019/06/26	4.1		%	25
6197677	MA4	Method Blank	Total Oil & Grease	2019/06/26	<0.50		mg/L	
6197682	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/06/26		97	%	85 - 115
6197682	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2019/06/26	3.2		%	25
6197682	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/06/26	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9H0731

Report Date: 2019/06/27

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: SB

VALIDATION SIGNATURE PAGE

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

Eva Pranjić

Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 686266-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/05
 Report #: R5784803
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H8263

Received: 2019/06/28, 09:16

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/05	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/06/29	2019/07/02	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/04	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/05	2019/07/05	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/06/29	2019/07/02	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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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 BV Labs, 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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 686266-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/05
Report #: R5784803
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9H8263
Received: 2019/06/28, 09:16

Encryption Key

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

=====

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BUREAU
VERITAS

BV Labs Job #: B9H8263
Report Date: 2019/07/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SS

RESULTS OF ANALYSES OF WATER

BV Labs ID			KDG804		
Sampling Date			2019/06/27 12:00		
COC Number			686266-04-01		
	UNITS	Criteria	S90331 POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.8	0.50	6203083
Inorganics					
pH	pH	6.5:8.5	7.92	N/A	6204213
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6206068
Total Suspended Solids	mg/L	-	4	1	6204964
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	1.8	0.50	6212433
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6212434
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9H8263

Report Date: 2019/07/05

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: SS

GENERAL COMMENTS

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

Package 1	21.3°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9H8263
Report Date: 2019/07/05

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: SS

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6204213	SAU	Spiked Blank	pH	2019/07/02		102	%	98 - 103
6204213	SAU	RPD	pH	2019/07/02	0.0075		%	N/A
6204964	MKX	QC Standard	Total Suspended Solids	2019/07/02		100	%	85 - 115
6204964	MKX	Method Blank	Total Suspended Solids	2019/07/02	<1		mg/L	
6204964	MKX	RPD	Total Suspended Solids	2019/07/02	2.3		%	25
6206068	BMO	Matrix Spike	Phenols-4AAP	2019/07/04		99	%	80 - 120
6206068	BMO	Spiked Blank	Phenols-4AAP	2019/07/04		97	%	80 - 120
6206068	BMO	Method Blank	Phenols-4AAP	2019/07/04	<0.0010		mg/L	
6206068	BMO	RPD	Phenols-4AAP	2019/07/04	NC		%	20
6212433	FA	Spiked Blank	Total Oil & Grease	2019/07/05		96	%	85 - 115
6212433	FA	RPD	Total Oil & Grease	2019/07/05	4.1		%	25
6212433	FA	Method Blank	Total Oil & Grease	2019/07/05	<0.50		mg/L	
6212434	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/05		93	%	85 - 115
6212434	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/05	3.2		%	25
6212434	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/05	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9H8263

Report Date: 2019/07/05

Golder Associates Ltd

Client Project #: 1407634

Site Location: MCCARTHY

Sampler Initials: SS

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read 'Brad Newman', positioned above a horizontal line.

Brad Newman, Scientific Service Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.



Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 670789-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/10
 Report #: R5791375
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9I4497

Received: 2019/07/05, 08:46

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/10	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/06	2019/07/08	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/08	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/10	2019/07/10	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/09	2019/07/10	CAM SOP-00428	SM 23 2540D m

Remarks:

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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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 670789-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/10
Report #: R5791375
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9I4497
Received: 2019/07/05, 08:46

Encryption Key

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

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BUREAU
VERITAS

BV Labs Job #: B914497
Report Date: 2019/07/10

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AH

RESULTS OF ANALYSES OF WATER

BV Labs ID			KEO496		
Sampling Date			2019/07/04 12:07		
COC Number			670789-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	0.90	0.50	6212663
Inorganics					
pH	pH	6.5:8.5	7.94	N/A	6215259
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6215908
Total Suspended Solids	mg/L	-	2	1	6219303
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	0.90	0.50	6220063
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6220076
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9I4497
Report Date: 2019/07/10

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AH

GENERAL COMMENTS

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

Package 1	27.0°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9I4497
Report Date: 2019/07/10

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6215259	SAU	Spiked Blank	pH	2019/07/08		101	%	98 - 103
6215259	SAU	RPD	pH	2019/07/08	0.083		%	N/A
6215908	BMO	Matrix Spike	Phenols-4AAP	2019/07/08		97	%	80 - 120
6215908	BMO	Spiked Blank	Phenols-4AAP	2019/07/08		101	%	80 - 120
6215908	BMO	Method Blank	Phenols-4AAP	2019/07/08	<0.0010		mg/L	
6215908	BMO	RPD	Phenols-4AAP	2019/07/08	NC		%	20
6219303	XH1	QC Standard	Total Suspended Solids	2019/07/10		95	%	85 - 115
6219303	XH1	Method Blank	Total Suspended Solids	2019/07/10	<1		mg/L	
6219303	XH1	RPD	Total Suspended Solids	2019/07/10	NC		%	25
6220063	FA	Spiked Blank	Total Oil & Grease	2019/07/10		95	%	85 - 115
6220063	FA	RPD	Total Oil & Grease	2019/07/10	3.9		%	25
6220063	FA	Method Blank	Total Oil & Grease	2019/07/10	<0.50		mg/L	
6220076	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/10		91	%	85 - 115
6220076	FA	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/10	3.8		%	25
6220076	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/10	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9I4497
Report Date: 2019/07/10

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: AH

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read 'Anastassia Hamanov', written over a horizontal line.

Anastassia Hamanov, Scientific Specialist

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Your Project #: 1407634
 Site Location: McCarthy
 Your C.O.C. #: 679277-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/18
 Report #: R5803362
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J1789

Received: 2019/07/12, 09:21

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/17	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/12	2019/07/15	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/15	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/17	2019/07/17	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/13	2019/07/15	CAM SOP-00428	SM 23 2540D m

Remarks:

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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 BV Labs, 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) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: McCarthy
Your C.O.C. #: 679277-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/18
Report #: R5803362
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9J1789
Received: 2019/07/12, 09:21

Encryption Key

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Ema Gitej, Senior Project Manager
Email: Ema.Gitej@bvlabs.com
Phone# (905)817-5829

=====

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RESULTS OF ANALYSES OF WATER

BV Labs ID			KGD770		KGD770	
Sampling Date			2019/07/11 14:10		2019/07/11 14:10	
COC Number			679277-01-01		679277-01-01	
	UNITS	Criteria	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	N/A	6224684
Inorganics						
pH	pH	6.5:8.5	8.09	N/A	8.09	6226495
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	N/A	6228398
Total Suspended Solids	mg/L	-	2	1	N/A	6226878
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	-	<0.50	0.50	N/A	6232114
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	N/A	6232115
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable						



BUREAU
VERITAS

BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

GENERAL COMMENTS

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

Package 1	23.3°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6226495	SAU	Spiked Blank	pH	2019/07/15		102	%	98 - 103
6226495	SAU	RPD [KGD770-03]	pH	2019/07/15	0.043		%	N/A
6226878	NB3	QC Standard	Total Suspended Solids	2019/07/15		99	%	85 - 115
6226878	NB3	Method Blank	Total Suspended Solids	2019/07/15	<1		mg/L	
6226878	NB3	RPD	Total Suspended Solids	2019/07/15	8.7		%	25
6228398	LHA	Matrix Spike	Phenols-4AAP	2019/07/15		99	%	80 - 120
6228398	LHA	Spiked Blank	Phenols-4AAP	2019/07/15		100	%	80 - 120
6228398	LHA	Method Blank	Phenols-4AAP	2019/07/15	<0.0010		mg/L	
6228398	LHA	RPD	Phenols-4AAP	2019/07/15	NC		%	20
6232114	SPK	Spiked Blank	Total Oil & Grease	2019/07/17		100	%	85 - 115
6232114	SPK	RPD	Total Oil & Grease	2019/07/17	2.0		%	25
6232114	SPK	Method Blank	Total Oil & Grease	2019/07/17	<0.50		mg/L	
6232115	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/17		93	%	85 - 115
6232115	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/17	2.1		%	25
6232115	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/17	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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



BUREAU
VERITAS

BV Labs Job #: B9J1789
Report Date: 2019/07/18

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy
Sampler Initials: GW

VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink, appearing to read "Brad Newman", written over a horizontal line.

Brad Newman, Scientific Service Specialist

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



Your Project #: 1407634
 Site Location: MCCARTHY
 Your C.O.C. #: 724340-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/31
 Report #: R5821681
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9K6589

Received: 2019/07/26, 09:13

Sample Matrix: Water
 # Samples Received: 1

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil and Grease	1	N/A	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2019/07/31	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	2019/07/26	2019/07/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2019/07/29	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2019/07/31	2019/07/31	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2019/07/27	2019/07/29	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

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

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

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

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

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

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

(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease



Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 724340-03-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2019/07/31
Report #: R5821681
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: B9K6589
Received: 2019/07/26, 09:13

Encryption Key

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

Ema Gitej, Senior Project Manager

Email: Ema.Gitej@bvlabs.com

Phone# (905)817-5829

=====
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BUREAU
VERITAS

BV Labs Job #: B9K6589
Report Date: 2019/07/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: KC

RESULTS OF ANALYSES OF WATER

BV Labs ID			KJF743		
Sampling Date			2019/07/25 13:38		
COC Number			724340-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	6249352
Inorganics					
pH	pH	6.5:8.5	8.32	N/A	6250065
Phenols-4AAP	mg/L	0.001	<0.0010	0.0010	6252125
Total Suspended Solids	mg/L	-	3	1	6250928
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6256631
Total Oil & Grease Mineral/Synthetic	mg/L	0.5	<0.50	0.50	6256632
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Criteria: Ontario Provincial Water Quality Objectives Ref. to MOEE Water Management document dated Feb.1999 N/A = Not Applicable					



BUREAU
VERITAS

BV Labs Job #: B9K6589
Report Date: 2019/07/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: KC

GENERAL COMMENTS

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

Package 1	23.0°C
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Results relate only to the items tested.



BUREAU
VERITAS

BV Labs Job #: B9K6589
Report Date: 2019/07/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: KC

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6250065	NYS	Spiked Blank	pH	2019/07/29		102	%	98 - 103
6250065	NYS	RPD	pH	2019/07/29	0.25		%	N/A
6250928	NB3	QC Standard	Total Suspended Solids	2019/07/29		100	%	85 - 115
6250928	NB3	Method Blank	Total Suspended Solids	2019/07/29	<1		mg/L	
6250928	NB3	RPD	Total Suspended Solids	2019/07/29	0		%	25
6252125	BMO	Matrix Spike	Phenols-4AAP	2019/07/29		103	%	80 - 120
6252125	BMO	Spiked Blank	Phenols-4AAP	2019/07/29		102	%	80 - 120
6252125	BMO	Method Blank	Phenols-4AAP	2019/07/29	<0.0010		mg/L	
6252125	BMO	RPD	Phenols-4AAP	2019/07/29	0		%	20
6256631	SPK	Spiked Blank	Total Oil & Grease	2019/07/31		94	%	85 - 115
6256631	SPK	RPD	Total Oil & Grease	2019/07/31	2.4		%	25
6256631	SPK	Method Blank	Total Oil & Grease	2019/07/31	<0.50		mg/L	
6256632	SPK	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2019/07/31		91	%	85 - 115
6256632	SPK	RPD	Total Oil & Grease Mineral/Synthetic	2019/07/31	3.8		%	25
6256632	SPK	Method Blank	Total Oil & Grease Mineral/Synthetic	2019/07/31	<0.50		mg/L	

N/A = Not Applicable

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

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

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.



BUREAU
VERITAS

BV Labs Job #: B9K6589
Report Date: 2019/07/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY
Sampler Initials: KC

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Senior Scientific Specialist

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Your Project #: 1407634
 Site Location: MCCCARTHY
 Your C.O.C. #: 715650-01-01

Attention: Jamie Bonany

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

Report Date: 2019/05/17
 Report #: R5715097
 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5330
Received: 2019/05/10, 08:51

Sample Matrix: Water
 # Samples Received: 3

Analyses	Quantity	Date	Date	Laboratory Method	Reference
		Extracted	Analyzed		
Alkalinity	3	N/A	2019/05/14	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	3	N/A	2019/05/14	CAM SOP-00463	SM 4500-Cl E m
Conductivity	3	N/A	2019/05/14	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2019/05/14	CAM SOP-00446	SM 23 5310 B m
Fluoride	3	2019/05/13	2019/05/14	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2019/05/15	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	3	2019/05/14	2019/05/15	CAM SOP-00447	EPA 6020B m
Total Metals Analysis by ICPMS	3	N/A	2019/05/14	CAM SOP-00447	EPA 6020B m
Anion and Cation Sum	3	N/A	2019/05/15		
Total Ammonia-N	2	N/A	2019/05/14	CAM SOP-00441	EPA GS I-2522-90 m
Total Ammonia-N	1	N/A	2019/05/15	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2019/05/14	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	3	2019/05/16	2019/05/16	CAM SOP-00326	EPA1664B m,SM5520A m
pH	3	2019/05/13	2019/05/14	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2019/05/13	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	3	N/A	2019/05/14	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	3	2019/05/13	2019/05/14	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	3	2019/05/14	2019/05/15	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2019/05/14	2019/05/15	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	3	2019/05/13	2019/05/14	CAM SOP-00428	SM 23 2540D m

Remarks:

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

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

Your Project #: 1407634
Site Location: MCCCARTHY
Your C.O.C. #: 715650-01-01

Attention: Jamie Bonany

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

Report Date: 2019/05/17
Report #: R5715097
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B9C5330

Received: 2019/05/10, 08:51

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

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

Results relate to samples tested. When sampling is not conducted by Maxxam, 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) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

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

Ema Gitej, Senior Project Manager

Email: EGitej@maxxam.ca

Phone# (905)817-5829

=====

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RESULTS OF ANALYSES OF WATER

Maxxam ID			JRI757		JRI758			JRI758		
Sampling Date			2019/05/08 03:45		2019/05/08 03:35			2019/05/08 03:35		
COC Number			715650-01-01		715650-01-01			715650-01-01		
	UNITS	Criteria	POND	QC Batch	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	14.1	6115808	14.0	N/A	6115808			
Cation Sum	me/L	-	14.9	6115808	15.1	N/A	6115808			
Hardness (CaCO3)	mg/L	-	460	6115619	460	1.0	6115619			
Inorganics										
Total Ammonia-N	mg/L	-	<0.050	6119255	<0.050	0.050	6119298			
Conductivity	mS/cm	-	1.43	6118641	1.43	0.001	6118641			
Total Dissolved Solids	mg/L	-	910	6119345	850	10	6119345			
Fluoride (F-)	mg/L	-	0.39	6118642	0.37	0.10	6118642			
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.32	6120923	0.24	0.10	6120923	0.23	0.10	6120923
Dissolved Organic Carbon	mg/L	-	5.7	6118252	5.8	0.50	6118252			
pH	pH	6.5:8.5	7.98	6118644	8.07		6118644			
Phenols-4AAP	mg/L	0.001	<0.0010	6117996	<0.0010	0.0010	6117996			
Total Phosphorus	mg/L	0.01	0.020	6121215	0.019	0.004	6121215			
Total Suspended Solids	mg/L	-	<10	6118217	<10	10	6118217			
Dissolved Sulphate (SO4)	mg/L	-	200	6119202	200	1.0	6119202	200	1.0	6119202
Alkalinity (Total as CaCO3)	mg/L	-	210	6118631	210	1.0	6118631			
Dissolved Chloride (Cl-)	mg/L	-	200	6119195	200	2.0	6119195	190	2.0	6119195
Nitrite (N)	mg/L	-	0.050	6118458	0.056	0.010	6118458			
Nitrate (N)	mg/L	-	1.94	6118458	2.02	0.10	6118458			
Nitrate + Nitrite (N)	mg/L	-	1.99	6118458	2.08	0.10	6118458			
Petroleum Hydrocarbons										
Total Oil & Grease	mg/L	-	<0.50	6124650	<0.50	0.50	6124650			
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										
Criteria: Ontario Provincial Water Quality Objectives										
Ref. to MOEE Water Management document dated Feb.1999										
N/A = Not Applicable										

RESULTS OF ANALYSES OF WATER

Maxxam ID			JRI759		
Sampling Date			2019/05/08 03:30		
COC Number			715650-01-01		
	UNITS	Criteria	SW2	RDL	QC Batch
Calculated Parameters					
Anion Sum	me/L	-	9.14	N/A	6115808
Cation Sum	me/L	-	9.53	N/A	6115808
Hardness (CaCO3)	mg/L	-	410	1.0	6115619
Inorganics					
Total Ammonia-N	mg/L	-	<0.050	0.050	6119416
Conductivity	mS/cm	-	0.859	0.001	6118641
Total Dissolved Solids	mg/L	-	500	10	6119345
Fluoride (F-)	mg/L	-	0.10	0.10	6118642
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.41	0.10	6120923
Dissolved Organic Carbon	mg/L	-	6.8	0.50	6118252
pH	pH	6.5:8.5	7.86		6118644
Phenols-4AAP	mg/L	0.001	0.0015	0.0010	6117996
Total Phosphorus	mg/L	0.01	0.022	0.004	6121215
Total Suspended Solids	mg/L	-	<10	10	6118217
Dissolved Sulphate (SO4)	mg/L	-	47	1.0	6119202
Alkalinity (Total as CaCO3)	mg/L	-	350	1.0	6118631
Dissolved Chloride (Cl-)	mg/L	-	39	1.0	6119195
Nitrite (N)	mg/L	-	<0.010	0.010	6118458
Nitrate (N)	mg/L	-	<0.10	0.10	6118458
Nitrate + Nitrite (N)	mg/L	-	<0.10	0.10	6118458
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	-	<0.50	0.50	6124650
No Fill	No Exceedance				
Grey	Exceeds 1 criteria policy/level				
Black	Exceeds both criteria/levels				
RDL = Reportable Detection Limit					
QC Batch = Quality Control Batch					
Criteria: Ontario Provincial Water Quality Objectives					
Ref. to MOEE Water Management document dated Feb.1999					
N/A = Not Applicable					

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			JRI757	JRI758	JRI759			JRI759		
Sampling Date			2019/05/08 03:45	2019/05/08 03:35	2019/05/08 03:30			2019/05/08 03:30		
COC Number			715650-01-01	715650-01-01	715650-01-01			715650-01-01		
	UNITS	Criteria	POND	SW1	SW2	RDL	QC Batch	SW2 Lab-Dup	RDL	QC Batch
Metals										
Total Arsenic (As)	ug/L	100	<1.0	<1.0	<1.0	1.0	6118977			
Total Cadmium (Cd)	ug/L	0.2	<0.10	<0.10	<0.10	0.10	6118977			
Dissolved Calcium (Ca)	ug/L	-	140000	130000	140000	200	6120458	150000	200	6120458
Total Calcium (Ca)	ug/L	-	140000	140000	150000	200	6118977			
Total Chromium (Cr)	ug/L	-	<5.0	<5.0	<5.0	5.0	6118977			
Total Copper (Cu)	ug/L	5	<1.0	<1.0	<1.0	1.0	6118977			
Total Iron (Fe)	ug/L	300	280	210	480	100	6118977			
Total Lead (Pb)	ug/L	5	<0.50	<0.50	<0.50	0.50	6118977			
Dissolved Magnesium (Mg)	ug/L	-	29000	30000	18000	50	6120458	18000	50	6120458
Total Magnesium (Mg)	ug/L	-	30000	31000	18000	50	6118977			
Total Manganese (Mn)	ug/L	-	54	44	95	2.0	6118977			
Total Nickel (Ni)	ug/L	25	1.4	1.4	<1.0	1.0	6118977			
Dissolved Potassium (K)	ug/L	-	8500	8800	2900	200	6120458	3100	200	6120458
Total Potassium (K)	ug/L	-	8500	8800	3000	200	6118977			
Dissolved Sodium (Na)	ug/L	-	130000	130000	27000	100	6120458	29000	100	6120458
Total Sodium (Na)	ug/L	-	130000	130000	28000	100	6118977			
Total Zinc (Zn)	ug/L	30	<5.0	<5.0	<5.0	5.0	6118977			
No Fill	No Exceedance									
Grey	Exceeds 1 criteria policy/level									
Black	Exceeds both criteria/levels									
RDL = Reportable Detection Limit										
QC Batch = Quality Control Batch										
Lab-Dup = Laboratory Initiated Duplicate										
Criteria: Ontario Provincial Water Quality Objectives										
Ref. to MOEE Water Management document dated Feb.1999										

TEST SUMMARY

Maxxam ID: JRI757
Sample ID: POND
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO ₃)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH ₄	6119255	N/A	2019/05/14	Chandra Nandlal
Nitrate (NO ₃) and Nitrite (NO ₂) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

Maxxam ID: JRI758
Sample ID: SW1
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO ₃)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH ₄	6119298	N/A	2019/05/15	Chandra Nandlal
Nitrate (NO ₃) and Nitrite (NO ₂) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

TEST SUMMARY

Maxxam ID: JRI758 Dup
Sample ID: SW1
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani

Maxxam ID: JRI759
Sample ID: SW2
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	6118631	N/A	2019/05/14	Surinder Rai
Chloride by Automated Colourimetry	KONE	6119195	N/A	2019/05/14	Alina Dobreanu
Conductivity	AT	6118641	N/A	2019/05/14	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	6118252	N/A	2019/05/14	Mandeep Kaur
Fluoride	ISE	6118642	2019/05/13	2019/05/14	Surinder Rai
Hardness (calculated as CaCO3)		6115619	N/A	2019/05/15	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	6118977	N/A	2019/05/14	Arefa Dabhad
Anion and Cation Sum	CALC	6115808	N/A	2019/05/15	Automated Statchk
Total Ammonia-N	LACH/NH4	6119416	N/A	2019/05/14	Chandra Nandlal
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	6118458	N/A	2019/05/14	Chandra Nandlal
Total Oil and Grease	BAL	6124650	2019/05/16	2019/05/16	Mansoor Ahmed
pH	AT	6118644	2019/05/13	2019/05/14	Surinder Rai
Phenols (4AAP)	TECH/PHEN	6117996	N/A	2019/05/13	Bramdeo Motiram
Sulphate by Automated Colourimetry	KONE	6119202	N/A	2019/05/14	Alina Dobreanu
Total Dissolved Solids	BAL	6119345	2019/05/13	2019/05/14	Nilam Borole
Total Kjeldahl Nitrogen in Water	SKAL	6120923	2019/05/14	2019/05/15	Shivani Shivani
Total Phosphorus (Colourimetric)	LACH/P	6121215	2019/05/14	2019/05/15	Louise Harding
Total Suspended Solids	BAL	6118217	2019/05/13	2019/05/14	Mandeep Kaur

Maxxam ID: JRI759 Dup
Sample ID: SW2
Matrix: Water

Collected: 2019/05/08
Shipped:
Received: 2019/05/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Lab Filtered Metals by ICPMS	ICP/MS	6120458	2019/05/14	2019/05/15	Arefa Dabhad

GENERAL COMMENTS

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

Package 1	6.7°C
Package 2	8.0°C
Package 3	8.0°C

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6117996	BMO	Matrix Spike	Phenols-4AAP	2019/05/13		96	%	80 - 120
6117996	BMO	Spiked Blank	Phenols-4AAP	2019/05/13		96	%	80 - 120
6117996	BMO	Method Blank	Phenols-4AAP	2019/05/13	<0.0010		mg/L	
6117996	BMO	RPD	Phenols-4AAP	2019/05/13	NC		%	20
6118217	MKX	QC Standard	Total Suspended Solids	2019/05/14		96	%	85 - 115
6118217	MKX	Method Blank	Total Suspended Solids	2019/05/14	<10		mg/L	
6118217	MKX	RPD	Total Suspended Solids	2019/05/14	6.7		%	25
6118252	KRM	Matrix Spike	Dissolved Organic Carbon	2019/05/14		91	%	80 - 120
6118252	KRM	Spiked Blank	Dissolved Organic Carbon	2019/05/14		94	%	80 - 120
6118252	KRM	Method Blank	Dissolved Organic Carbon	2019/05/14	<0.50		mg/L	
6118252	KRM	RPD	Dissolved Organic Carbon	2019/05/14	1.3		%	20
6118458	C_N	Matrix Spike	Nitrite (N)	2019/05/14		107	%	80 - 120
			Nitrate (N)	2019/05/14		104	%	80 - 120
6118458	C_N	Spiked Blank	Nitrite (N)	2019/05/14		103	%	80 - 120
			Nitrate (N)	2019/05/14		104	%	80 - 120
6118458	C_N	Method Blank	Nitrite (N)	2019/05/14	<0.010		mg/L	
			Nitrate (N)	2019/05/14	<0.10		mg/L	
6118458	C_N	RPD	Nitrite (N)	2019/05/14	NC		%	20
			Nitrate (N)	2019/05/14	NC		%	20
6118631	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2019/05/14		96	%	85 - 115
6118631	SAU	Method Blank	Alkalinity (Total as CaCO3)	2019/05/14	<1.0		mg/L	
6118631	SAU	RPD	Alkalinity (Total as CaCO3)	2019/05/14	0.47		%	20
6118641	SAU	Spiked Blank	Conductivity	2019/05/14		100	%	85 - 115
6118641	SAU	Method Blank	Conductivity	2019/05/14	<0.001		mS/cm	
6118641	SAU	RPD	Conductivity	2019/05/14	0.55		%	25
6118642	SAU	Matrix Spike	Fluoride (F-)	2019/05/14		105	%	80 - 120
6118642	SAU	Spiked Blank	Fluoride (F-)	2019/05/14		101	%	80 - 120
6118642	SAU	Method Blank	Fluoride (F-)	2019/05/14	<0.10		mg/L	
6118642	SAU	RPD	Fluoride (F-)	2019/05/14	0.94		%	20
6118644	SAU	Spiked Blank	pH	2019/05/14		102	%	98 - 103
6118644	SAU	RPD	pH	2019/05/14	0.16		%	N/A
6118977	ADA	Matrix Spike	Total Arsenic (As)	2019/05/14		102	%	80 - 120
			Total Cadmium (Cd)	2019/05/14		100	%	80 - 120
			Total Calcium (Ca)	2019/05/14		NC	%	80 - 120
			Total Chromium (Cr)	2019/05/14		97	%	80 - 120
			Total Copper (Cu)	2019/05/14		102	%	80 - 120
			Total Iron (Fe)	2019/05/14		101	%	80 - 120
			Total Lead (Pb)	2019/05/14		95	%	80 - 120
			Total Magnesium (Mg)	2019/05/14		99	%	80 - 120
			Total Manganese (Mn)	2019/05/14		98	%	80 - 120
			Total Nickel (Ni)	2019/05/14		97	%	80 - 120
			Total Potassium (K)	2019/05/14		102	%	80 - 120
			Total Sodium (Na)	2019/05/14		NC	%	80 - 120
			Total Zinc (Zn)	2019/05/14		101	%	80 - 120
6118977	ADA	Spiked Blank	Total Arsenic (As)	2019/05/14		100	%	80 - 120
			Total Cadmium (Cd)	2019/05/14		100	%	80 - 120
			Total Calcium (Ca)	2019/05/14		103	%	80 - 120
			Total Chromium (Cr)	2019/05/14		97	%	80 - 120
			Total Copper (Cu)	2019/05/14		99	%	80 - 120
			Total Iron (Fe)	2019/05/14		99	%	80 - 120
			Total Lead (Pb)	2019/05/14		96	%	80 - 120
			Total Magnesium (Mg)	2019/05/14		99	%	80 - 120
			Total Manganese (Mn)	2019/05/14		97	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits	
6118977	ADA	Method Blank	Total Nickel (Ni)	2019/05/14		97	%	80 - 120	
			Total Potassium (K)	2019/05/14		100	%	80 - 120	
			Total Sodium (Na)	2019/05/14		99	%	80 - 120	
			Total Zinc (Zn)	2019/05/14		100	%	80 - 120	
			Total Arsenic (As)	2019/05/14	<1.0			ug/L	
			Total Cadmium (Cd)	2019/05/14	<0.10			ug/L	
			Total Calcium (Ca)	2019/05/14	<200			ug/L	
			Total Chromium (Cr)	2019/05/14	<5.0			ug/L	
			Total Copper (Cu)	2019/05/14	<1.0			ug/L	
			Total Iron (Fe)	2019/05/14	<100			ug/L	
			Total Lead (Pb)	2019/05/14	<0.50			ug/L	
			Total Magnesium (Mg)	2019/05/14	<50			ug/L	
			Total Manganese (Mn)	2019/05/14	<2.0			ug/L	
			Total Nickel (Ni)	2019/05/14	<1.0			ug/L	
6118977	ADA	RPD	Total Potassium (K)	2019/05/14	<200		ug/L		
			Total Sodium (Na)	2019/05/14	<100		ug/L		
			Total Zinc (Zn)	2019/05/14	<5.0		ug/L		
6118977	ADA	RPD	Total Manganese (Mn)	2019/05/14	6.8		%	20	
			Total Zinc (Zn)	2019/05/14	3.9		%	20	
6119195	ADB	Matrix Spike [JRI758-02]	Dissolved Chloride (Cl-)	2019/05/14		NC	%	80 - 120	
6119195	ADB	Spiked Blank	Dissolved Chloride (Cl-)	2019/05/14		102	%	80 - 120	
6119195	ADB	Method Blank	Dissolved Chloride (Cl-)	2019/05/14	<1.0		mg/L		
6119195	ADB	RPD [JRI758-02]	Dissolved Chloride (Cl-)	2019/05/14	1.3		%	20	
6119202	ADB	Matrix Spike [JRI758-02]	Dissolved Sulphate (SO4)	2019/05/14		NC	%	75 - 125	
6119202	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2019/05/14		103	%	80 - 120	
6119202	ADB	Method Blank	Dissolved Sulphate (SO4)	2019/05/14	<1.0		mg/L		
6119202	ADB	RPD [JRI758-02]	Dissolved Sulphate (SO4)	2019/05/14	0.26		%	20	
6119255	C_N	Matrix Spike	Total Ammonia-N	2019/05/14		89	%	75 - 125	
6119255	C_N	Spiked Blank	Total Ammonia-N	2019/05/14		100	%	80 - 120	
6119255	C_N	Method Blank	Total Ammonia-N	2019/05/14	<0.050		mg/L		
6119255	C_N	RPD	Total Ammonia-N	2019/05/14	0.45		%	20	
6119298	C_N	Matrix Spike	Total Ammonia-N	2019/05/15		99	%	75 - 125	
6119298	C_N	Spiked Blank	Total Ammonia-N	2019/05/15		100	%	80 - 120	
6119298	C_N	Method Blank	Total Ammonia-N	2019/05/15	<0.050		mg/L		
6119298	C_N	RPD	Total Ammonia-N	2019/05/15	0.45		%	20	
6119345	NB3	QC Standard	Total Dissolved Solids	2019/05/14		95	%	90 - 110	
6119345	NB3	Method Blank	Total Dissolved Solids	2019/05/14	<10		mg/L		
6119345	NB3	RPD	Total Dissolved Solids	2019/05/14	NC		%	25	
6119416	C_N	Matrix Spike	Total Ammonia-N	2019/05/14		95	%	75 - 125	
6119416	C_N	Spiked Blank	Total Ammonia-N	2019/05/14		97	%	80 - 120	
6119416	C_N	Method Blank	Total Ammonia-N	2019/05/14	<0.050		mg/L		
6119416	C_N	RPD	Total Ammonia-N	2019/05/14	NC		%	20	
6120458	ADA	Matrix Spike [JRI759-02]	Dissolved Calcium (Ca)	2019/05/15		NC	%	80 - 120	
			Dissolved Magnesium (Mg)	2019/05/15		107	%	80 - 120	
			Dissolved Potassium (K)	2019/05/15		112	%	80 - 120	
			Dissolved Sodium (Na)	2019/05/15		NC	%	80 - 120	
6120458	ADA	Spiked Blank	Dissolved Calcium (Ca)	2019/05/15		99	%	80 - 120	
			Dissolved Magnesium (Mg)	2019/05/15		101	%	80 - 120	
			Dissolved Potassium (K)	2019/05/15		101	%	80 - 120	
			Dissolved Sodium (Na)	2019/05/15		100	%	80 - 120	
6120458	ADA	Method Blank	Dissolved Calcium (Ca)	2019/05/15	<200		ug/L		
			Dissolved Magnesium (Mg)	2019/05/15	<50		ug/L		
			Dissolved Potassium (K)	2019/05/15	<200		ug/L		

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
6120458	ADA	RPD [JRI759-02]	Dissolved Sodium (Na)	2019/05/15	<100		ug/L	
			Dissolved Calcium (Ca)	2019/05/15	8.9		%	20
			Dissolved Magnesium (Mg)	2019/05/15	4.6		%	20
			Dissolved Potassium (K)	2019/05/15	8.2		%	20
			Dissolved Sodium (Na)	2019/05/15	8.5		%	20
6120923	SSV	Matrix Spike [JRI758-06]	Total Kjeldahl Nitrogen (TKN)	2019/05/15		99	%	80 - 120
6120923	SSV	QC Standard	Total Kjeldahl Nitrogen (TKN)	2019/05/15		96	%	80 - 120
6120923	SSV	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2019/05/15		97	%	80 - 120
6120923	SSV	Method Blank	Total Kjeldahl Nitrogen (TKN)	2019/05/15	<0.10		mg/L	
6120923	SSV	RPD [JRI758-06]	Total Kjeldahl Nitrogen (TKN)	2019/05/15	4.3		%	20
6121215	LHA	Matrix Spike	Total Phosphorus	2019/05/15		120	%	80 - 120
6121215	LHA	QC Standard	Total Phosphorus	2019/05/15		108	%	80 - 120
6121215	LHA	Spiked Blank	Total Phosphorus	2019/05/15		110	%	80 - 120
6121215	LHA	Method Blank	Total Phosphorus	2019/05/15	<0.004		mg/L	
6121215	LHA	RPD	Total Phosphorus	2019/05/15	1.0		%	20
6124650	MA4	Spiked Blank	Total Oil & Grease	2019/05/16		98	%	85 - 115
6124650	MA4	RPD	Total Oil & Grease	2019/05/16	3.4		%	25
6124650	MA4	Method Blank	Total Oil & Grease	2019/05/16	<0.50		mg/L	

N/A = Not Applicable

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

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

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.

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).

VALIDATION SIGNATURE PAGE

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

Ewa Pranjić, M.Sc., C.Chem, Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

**Exceedence Summary Table – Prov. Water Quality Obj.
Result Exceedences**

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
POND	JRI757-06	Total Phosphorus	0.01	0.020	0.004	mg/L
SW1	JRI758-06	Total Phosphorus	0.01	0.019	0.004	mg/L
SW2	JRI759-04	Total Iron (Fe)	300	480	100	ug/L
SW2	JRI759-07	Phenols-4AAP	0.001	0.0015	0.0010	mg/L
SW2	JRI759-06	Total Phosphorus	0.01	0.022	0.004	mg/L

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

**CLIENT NAME: GOLDER ASSOCIATES LTD.
121 COMMERCE PARK DRIVE, UNIT L
BARRIE, ON L4N8X1
(705) 722-4492**

ATTENTION TO: Scott Patrick

PROJECT: 1407634

AGAT WORK ORDER: 19M465644

ECOTOX ANALYSIS REVIEWED BY: Virginie Bérubé, biologiste

DATE REPORTED: 2019-06-01

VERSION*: 1

PAGES (INCLUDING COVER): 5

Should you require any information regarding this analysis please contact your client services representative at (514) 337-1000

*NOTES

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

Certificate of Analysis

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
<http://www.agatlabs.com>

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

Daphnia Lethality (D.magna) single concentration-48h

DATE RECEIVED: 2019-05-10

DATE REPORTED: 2019-06-01

Parameter	Unit	G / S	RDL	184923
Mortality 100% v/v	% mortality-48h			0
Acute Lethality				PASS

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

184923 Refer to the annex for analysis details.
Acute lethality: PASS (mortality: 50% or less)
Acute lethality: FAIL (mortality: more than 50%)

Certified By: _____



AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC.



Certificate of Analysis

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

9770 ROUTE TRANSCANADIENNE
ST. LAURENT, QUEBEC
CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
<http://www.agatlabs.com>

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

Rainbow Trout Lethality (O. mykiss) single concentration-96h

DATE RECEIVED: 2019-05-10

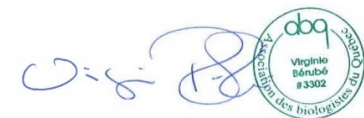
DATE REPORTED: 2019-06-01

Parameter	Unit	G / S	RDL	184923
Mortality 100% v/v	% mortality-96h			0
Acute Lethality				PASS

Comments: RDL - Reported Detection Limit; G / S - Guideline / Standard

184923 Refer to the annex for analysis details.
Acute lethality: PASS (mortality: 50% or less)
Acute lethality: FAIL (mortality: more than 50%)

Certified By:



AGAT Laboratories' procedure for signatures and signatories adheres strictly to the requirements of accreditation ISO 17025:2005 as required by CALA, SCC and MDDELCC where applicable. All electronic signatures on AGAT certificates are password protected and all signatories meet their regional and scope of accreditation requirements and are approved by CALA, SCC and MDDELCC.



Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 19M465644

PROJECT: 1407634

ATTENTION TO: Scott Patrick

SAMPLED BY:

SAMPLING SITE:

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
ECOTOX Analysis					
Mortality 100% v/v					
Acute Lethality					
Mortality 100% v/v			ECO-152-20000F	EPS1/RM/13	
Acute Lethality					



golder.com