August 2017

MCCARTHY QUARRY

Environmental Compliance Approval Quarterly Monitoring Report (May to August, 2017)

Submitted to:
Cindy Hood
Ontario Ministry of Environment
Barrie District Office
1203-54 Cedar Pointe Drive
Barrie ON L4N 5R7

REPORT

Report Number: 1407634

Distribution:

1 Copy - Ontario Ministry of Environment Barrie District Office
1 Copy - Coco Aggregates Inc.
1 Copy - Golder Associates Ltd.

Golder Associates

Table of Contents

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 m^3 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 water quality monitoring of the quarry discharge 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 water quality monitoring of discharge water is required per Section 7(2) for Total Suspended Solids (TSS), Oil and Grease, Phenolics (4AAP) and pH at the McCarthy Pond.

Water quality monitoring 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 testing 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 June 12 to June 16, 2017. The monthly lethality sample was not collected from the McCarthy Pond during the month of June 2017.

4.0 QUARRY DISCHARGE MONITORING RESULTS

All laboratory certificates of analysis for the May to August 2017 monitoring period are included in Appendix B. Results of the quarry discharge monitoring are summarize below:

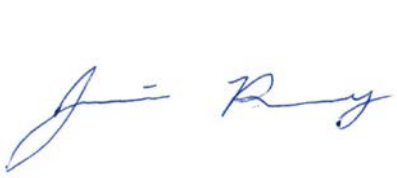
- The TSS, pH, Oil and Grease and Phenol (4AAP) concentrations were all below the daily concentration limits of the ECA (Table 1);
- The TSS, Oil and Grease and Phenol (4AAP) concentrations were all below the monthly concentration limits of the ECA (Table 2);
- The semi-annual surface water sampling results were below the PWQO, with the exception of iron and phosphors at SW2 (Table 3);
- The quarry discharge between May and August, 2017 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, 2017 was below the permitted rate of 4,545 L/min (76 L/sec) (Table 5).

5.0 SUMMARY

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

Report Signature Page

GOLDER ASSOCIATES LTD.

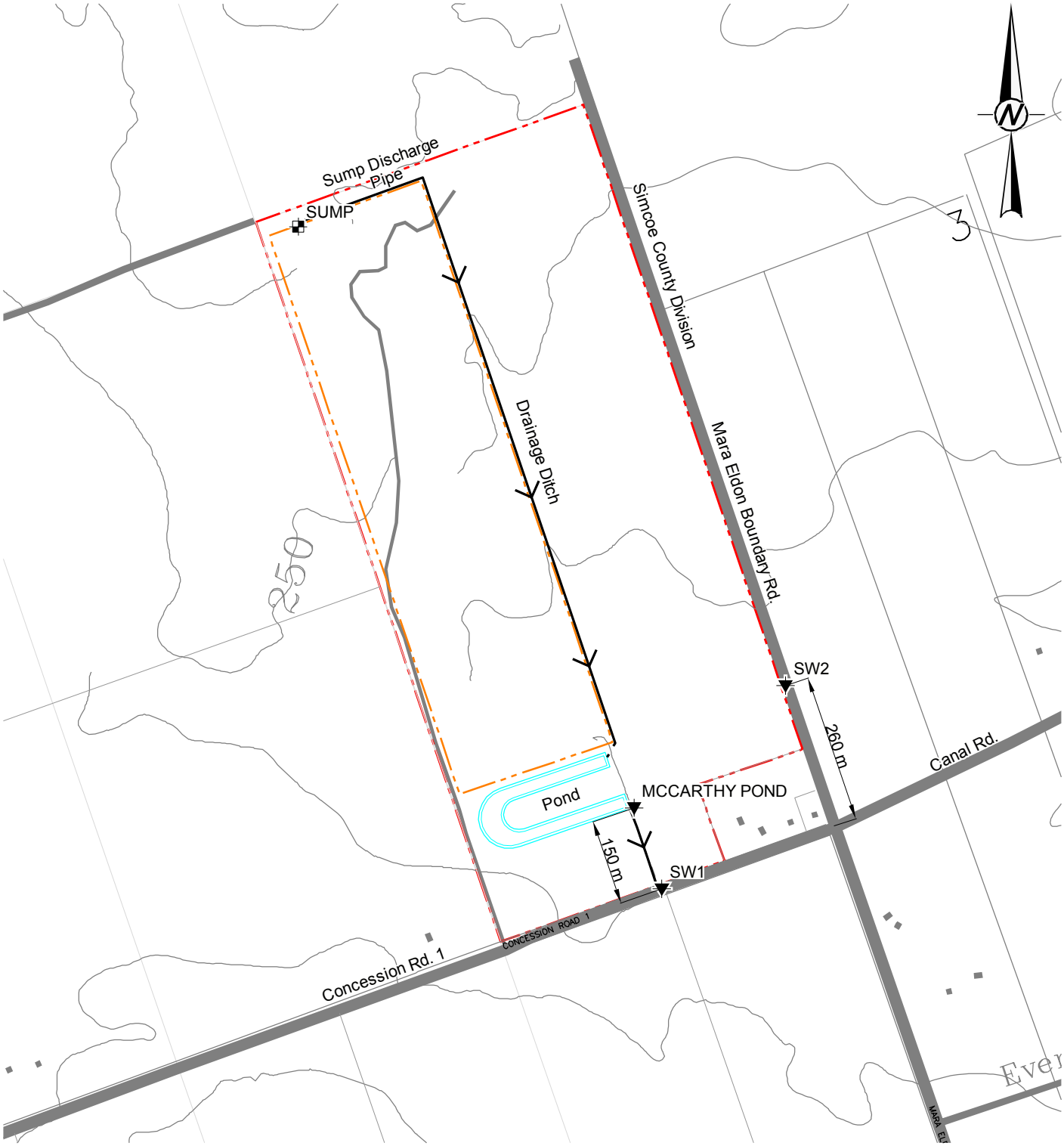


Jamie Bonany, M.A.Sc.
Project Scientist

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

JEB/JAE/plc

FIGURE



LEGEND

- Approximate Property Boundary
- Approximate Licenced Boundary
- 5 m Contour Line
- Surface Water Sampling Location

REFERENCES AND NOTES

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

0 200 400 600 m

1:10000

CLIENT
COCO / QBJR AGGREGATES INC.

PROJECT
STAN MCCARTHY QUARRY

TITLE
LOCATION MAP

CONSULTANT
Golder Associates

YYYY-MM-DD	2014-09-02
PREPARED	STB
DESIGN	
REVIEW	
APPROVED	

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

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

25 mm

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Path: \\golder.gds\gal\Barrie\CAD\Projects\2014\14-07634 (Brechin, Coco Enviro and HydroG)\AB\ | File Name: 1407634ABSITE.dwg

TABLES

Table 1: McCarthy Pond Weekly Water Quality Results (May to August 2017)

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Daily Concentration Limit[2]	McCarthy Quarry											
Sample ID					Pond											
Date					04-May-17	11-May-17	17-May-17	25-May-17	01-Jun-17	08-Jun-17	22-Jun-17	29-Jun-17	06-Jul-17	13-Jul-17	20-Jul-17	27-Jul-17
pH	pH	n/a		6.0-9.5	7.77	8.43	8.26	8.2	8.38	8.41	9.11	8.68	8.36	8.47	7.96	8.46
Total Suspended Solids	mg/L	1		30	3	5	7	5	6	5	5	2	3	6	4	3
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	1.3	4.0	<0.5	2.8	1.9	2.0	<0.5	<0.5	4.1	1.6	0.9
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<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 discolouration 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 preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 2: McCarthy Pond Monthly Water Quality Results (May to August 2017)

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Monthly Concentration Limit[2]	McCarthy Quarry		
Sample ID					**Pond**		
Date					May	June	July
Total Suspended Solids	mg/L	1		15	5.0	4.5	4.0
Total Oil and Grease	mg/L	0.5	Note 3	15	1.8	1.6	1.8
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. Monthyl 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 discolouration 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 preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

Table 3: McCarthy Semi-Annual Water Quality Monitoring Results (May 2017)

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry		
Sample ID						**Pond**	**SW1**	**SW2**
Date						**23-May-17**	**23-May-17**	**23-May-17**
Field Measured Parameters								
Conductivity	µS/cm					916	884	520
pH	pH	n/a	6.5-8.5		6.0-9.5	8.45	8.5	7.68
Temperature	°C	n/a				16.8	15.4	13.3
Calculated Parameters								
Anion Sum	me/L	N/A				10.1	9.82	6.31
Cation Sum	me/L	N/A				10.3	10.3	6.52
Hardness (CaCO3)	mg/L	1.0				300	300	310
Inorganics								
Total Ammonia-N	mg/L	0.050				<0.050	<0.050	<0.050
Conductivity	ms/cm	1.0				1.01	0.988	0.570
Total Dissolved Solids	mg/L	10				638	622	362
Fluoride (F-)	mg/L	0.10				0.58	0.55	0.10
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.26	0.51	0.62
Dissolved Organic Carbon	mg/L	0.20				3.8	3.7	13
pH	pH	N/A	6.5-8.5		6.0-9.5	8.10	8.01	8.04
Phenols-4AAP	mg/L	0.0010			0.04	<0.0010	<0.0010	<0.0010
Total Phosphorus	mg/L	0.002		0.02[5b]		0.012	0.016	*0.035*
Total Suspended Solids	mg/L	10			30	<10	<10	12
Dissolved Sulphate (SO4)	mg/L	1				260	240	22
Alkalinity (Total as CaCO3)	mg/L	1.0				110	120	280
Dissolved Chloride (Cl)	mg/L	1				84	79	7.7
Nitrite (N)	mg/L	0.010				0.119	0.109	<0.010
Nitrate (N)	mg/L	0.10				2.91	2.80	<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				70	73	110
Total Calcium (Ca)	ug/L	200				64000	68000	110000
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			<100	<100	310
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				30	30	6.5
Total Magnesium (Mg)	ug/L	50				29000	28000	6400
Total Manganese (Mn)	ug/L	2				10	14	62
Total Nickel (Ni)	ug/L	1	25			1.5	1.3	<1.0
Dissolved Potassium (K)	mg/L	1				12	12	3
Total Potassium (K)	ug/L	200				11000	11000	2200
Dissolved Sodium (Na)	mg/L	0.5				92	90	6.9
Total Sodium (Na)	ug/L	100				85000	83000	6200
Total Zinc (Zn)	ug/L	5	30	20		<5.0	<5.0	5.0

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. Interim Provincial Water Quality Objectives (Interim PWQO); *shaded cells and italics denote Interim PWQO exceedance*; some PWQOs are dependent on other water quality parameters hence the range in guideline values, refer to PQWO notes.

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 discolouration 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 preceeded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

5a. Aluminum (Interim):

- 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.

5b. Phosphorus (Interim):

- 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.

5c. Beryllium:	If Hardness <75 mg/L (CaCO3), use 11 ug/L If Hardness >75 mg/L (CaCO3), use 1100 ug/L
5d. Cadmium: (Interim)	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
5e. Chromium:	1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)
5f. Copper: (Interim)	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
5g. Lead:	If Alkalinity as CaCO3 (mg/L) is < 20, 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
5h. Lead: (Interim)	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

Table 4: Lethality Monitoring at McCarthy Pond

	Unit	Mortality Limit	McCarthy Quarry	
Sample ID			**Pond**	
Date			**23-May-17**	**11-Jul-17**
Daphnia Magna	% Mortality Rate*	<50%	0	0
Rainbow Trout	% Mortality Rate*	<50%	0	0

* Test results represent accute 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-17	6AM	6PM	43200	720	1,512,000	35	2,100
2-May-17	6AM	7PM	46800	780	1,638,000	35	2,100
3-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
4-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
5-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
6-May-17	NO PUMP		0	0	-	-	-
7-May-17	NO PUMP		0	0	-	-	-
8-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
9-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
10-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
11-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
12-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
13-May-17	NO PUMP		0	0	-	-	-
14-May-17	NO PUMP		0	0	-	-	-
15-May-17	NO PUMP		0	0	-	-	-
16-May-17	12PM	7PM	25200	420	882,000	35	2,100
17-May-17	NO PUMP		0	0	-	-	-
18-May-17	9AM	6PM	32400	540	1,134,000	35	2,100
19-May-17	NO PUMP		0	0	-	-	-
20-May-17	NO PUMP		0	0	-	-	-
21-May-17	NO PUMP		0	0	-	-	-
22-May-17	NO PUMP		0	0	-	-	-
23-May-17	6AM	7PM	46800	780	1,638,000	35	2,100
24-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
25-May-17	6AM	6PM	43200	720	1,512,000	35	2,100
26-May-17	6AM	4PM	36000	600	1,260,000	35	2,100
27-May-17	NO PUMP		0	0	-	-	-
28-May-17	NO PUMP		0	0	-	-	-
29-May-17	NO PUMP		0	0	-	-	-
30-May-17	NO PUMP		0	0	-	-	-
31-May-17	NO PUMP		0	0	-	-	-
1-Jun-17	NO PUMP		0	0	-	-	-
2-Jun-17	7AM	5PM	36000	600	1,260,000	35	2,100
3-Jun-17	NO PUMP		0	0	-	-	-
4-Jun-17	NO PUMP		0	0	-	-	-
5-Jun-17	7AM	6PM	39600	660	1,386,000	35	2,100
6-Jun-17	7AM	6PM	39600	660	1,386,000	35	2,100
7-Jun-17	6AM	6PM	43200	720	1,512,000	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-17	6AM	6PM	43200	720	1,512,000	35	2,100
9-Jun-17	6AM	4PM	36000	600	1,260,000	35	2,100
10-Jun-17	NO PUMP		0	0	-	-	-
11-Jun-17	NO PUMP		0	0	-	-	-
12-Jun-17	NO PUMP		0	0	-	-	-
13-Jun-17	NO PUMP		0	0	-	-	-
14-Jun-17	NO PUMP		0	0	-	-	-
15-Jun-17	NO PUMP		0	0	-	-	-
16-Jun-17	NO PUMP		0	0	-	-	-
17-Jun-17	NO PUMP		0	0	-	-	-
18-Jun-17	NO PUMP		0	0	-	-	-
19-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
20-Jun-17	7AM	5PM	39600	660	1,386,000	35	2,100
21-Jun-17	6AM	9AM	10800	180	378,000	35	2,100
22-Jun-17	6AM	7PM	46800	780	1,638,000	35	2,100
23-Jun-17	6AM	5PM	39600	660	1,386,000	35	2,100
24-Jun-17	NO PUMP		0	0	-	-	-
25-Jun-17	NO PUMP		0	0	-	-	-
26-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
27-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
28-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
29-Jun-17	6AM	6PM	43200	720	1,512,000	35	2,100
30-Jun-17	6AM	4PM	36000	600	1,260,000	35	2,100
1-Jul-17	NO PUMP		0	0	-	-	-
2-Jul-17	NO PUMP		0	0	-	-	-
3-Jul-17	NO PUMP		0	0	-	-	-
4-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jul-17	NO PUMP		0	0	-	-	-
6-Jul-17	NO PUMP		0	0	-	-	-
7-Jul-17	NO PUMP		0	0	-	-	-
8-Jul-17	NO PUMP		0	0	-	-	-
9-Jul-17	NO PUMP		0	0	-	-	-
10-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
11-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jul-17	NO PUMP		0	0	-	-	-
13-Jul-17	6AM	7PM	46800	780	1,638,000	35	2,100
14-Jul-17	6AM	7PM	46800	780	1,638,000	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**
15-Jul-17	NO PUMP		0	0	-	-	-
16-Jul-17	NO PUMP		0	0	-	-	-
17-Jul-17	NO PUMP		0	0	-	-	-
18-Jul-17	NO PUMP		0	0	-	-	-
19-Jul-17	NO PUMP		0	0	-	-	-
20-Jul-17	NO PUMP		0	0	-	-	-
21-Jul-17	NO PUMP		0	0	-	-	-
22-Jul-17	NO PUMP		0	0	-	-	-
23-Jul-17	NO PUMP		0	0	-	-	-
24-Jul-17	NO PUMP		0	0	-	-	-
25-Jul-17	6AM	6PM	43200	720	1,512,000	35	2,100
26-Jul-17	NO PUMP		0	0	-	-	-
27-Jul-17	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jul-17	NO PUMP		0	0	-	-	-
29-Jul-17	NO PUMP		0	0	-	-	-
30-Jul-17	NO PUMP		0	0	-	-	-
31-Jul-17	NO PUMP		0	0	-	-	-

APPENDIX A

Environmental Compliance Approval No. 4731-987KM8

- AKossi
- GQ.

Ontario

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* .

Table 1 - Effluent Limits

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:

Table 2 - Effluent Monitoring - (End of Pipe Discharge Point)

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 CaCO3), Alkalinity(as CaCO3), 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

Water Quality Results

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 583850-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/29
Report #: R4490399
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A3593
Received: 2017/05/20, 10:04

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/05/25	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/05/25	2017/05/25	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/05/25	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/05/26	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/05/25	2017/05/25	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/05/24	2017/05/24	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 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.

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.

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.

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 583850-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/29
Report #: R4490399
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A3593
Received: 2017/05/20, 10:04

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

==========

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.

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Maxxam Job #: B7A3593
Report Date: 2017/05/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		EKM276		
Sampling Date		2017/05/17 12:30		
COC Number		583850-04-01		
	UNITS	**5090331 POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	3.5	0.50	4993031
Inorganics				
pH	pH	8.26	N/A	4997509
Phenols-4AAP	mg/L	<0.0010	0.0010	5000981
Total Suspended Solids	mg/L	7	1	4996274
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	4.0	0.50	4997802
Total Oil & Grease Mineral/Synthetic	mg/L	0.50	0.50	4997806

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B7A3593
Report Date: 2017/05/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B7A3593
Report Date: 2017/05/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4996274	LWA	QC Standard	Total Suspended Solids	2017/05/24		95	%	85 - 115
4996274	LWA	Method Blank	Total Suspended Solids	2017/05/24	<1		mg/L	
4996274	LWA	RPD	Total Suspended Solids	2017/05/24	16		%	25
4997509	SAU	Spiked Blank	pH	2017/05/25		102	%	98 - 103
4997509	SAU	RPD	pH	2017/05/25	0.18		%	N/A
4997802	FA	Spiked Blank	Total Oil & Grease	2017/05/25		101	%	85 - 115
4997802	FA	RPD	Total Oil & Grease	2017/05/25	4.8		%	25
4997802	FA	Method Blank	Total Oil & Grease	2017/05/25	<0.50		mg/L	
4997806	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/05/25		96	%	85 - 115
4997806	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/05/25	4.2		%	25
4997806	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/05/25	<0.50		mg/L	
5000981	ZSK	Matrix Spike	Phenols-4AAP	2017/05/26		100	%	80 - 120
5000981	ZSK	Spiked Blank	Phenols-4AAP	2017/05/26		99	%	85 - 115
5000981	ZSK	Method Blank	Phenols-4AAP	2017/05/26	<0.0010		mg/L	
5000981	ZSK	RPD	Phenols-4AAP	2017/05/26	NC		%	20

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).

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Maxxam Job #: B7A3593
Report Date: 2017/05/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

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, Scientific Services

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.

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: MCCARTHY
Site Location: MCCARTHY
Your C.O.C. #: 577938-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/02
Report #: R4496897
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A7907
Received: 2017/05/26, 09:10

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/05/31	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/05/31	2017/05/31	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/05/31	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/06/01	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/05/31	2017/05/31	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/05/30	2017/05/30	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 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.

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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.

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

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Your Project #: 1407634
Site#: MCCARTHY
Site Location: MCCARTHY
Your C.O.C. #: 577938-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/02
Report #: R4496897
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A7907
Received: 2017/05/26, 09:10

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7A7907
Report Date: 2017/06/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		ELH195		
Sampling Date		2017/05/25 12:30		
COC Number		577938-04-01		
	UNITS	**590331-POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	5002679
Inorganics				
pH	pH	8.20	N/A	5005928
Phenols-4AAP	mg/L	<0.0010	0.0010	5008751
Total Suspended Solids	mg/L	5	2	5005326
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	5006325
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5006339

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B7A7907
Report Date: 2017/06/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B7A7907
Report Date: 2017/06/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5005326	LWA	QC Standard	Total Suspended Solids	2017/05/30		98	%	85 - 115
5005326	LWA	Method Blank	Total Suspended Solids	2017/05/30	<1		mg/L	
5005326	LWA	RPD	Total Suspended Solids	2017/05/30	NC		%	25
5005928	TA1	Spiked Blank	pH	2017/05/31		101	%	98 - 103
5005928	TA1	RPD	pH	2017/05/31	0.37		%	N/A
5006325	MA4	Spiked Blank	Total Oil & Grease	2017/05/31		95	%	85 - 115
5006325	MA4	RPD	Total Oil & Grease	2017/05/31	2.9		%	25
5006325	MA4	Method Blank	Total Oil & Grease	2017/05/31	<0.50		mg/L	
5006339	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/05/31		94	%	85 - 115
5006339	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2017/05/31	2.9		%	25
5006339	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/05/31	<0.50		mg/L	
5008751	ZSK	Matrix Spike	Phenols-4AAP	2017/06/01		100	%	80 - 120
5008751	ZSK	Spiked Blank	Phenols-4AAP	2017/06/01		101	%	85 - 115
5008751	ZSK	Method Blank	Phenols-4AAP	2017/06/01	<0.0010		mg/L	
5008751	ZSK	RPD	Phenols-4AAP	2017/06/01	NC		%	20

N/A = Not Applicable

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

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Maxxam Job #: B7A7907
Report Date: 2017/06/02

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

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, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 583850-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/09
Report #: R4505729
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7B4147
Received: 2017/06/02, 09:22

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/06/08	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/06/08	2017/06/08	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/06/06	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/06/05	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/06/08	2017/06/08	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/06/05	2017/06/06	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 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.

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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.

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 583850-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/09
Report #: R4505729
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7B4147
Received: 2017/06/02, 09:22

Encryption Key

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Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7B4147
Report Date: 2017/06/09

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		EMM203		
Sampling Date		2017/06/01 12:30		
COC Number		583850-03-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	2.8	0.50	5012029
Inorganics				
pH	pH	8.38	N/A	5013763
Phenols-4AAP	mg/L	0.0010	0.0010	5013509
Total Suspended Solids	mg/L	6	1	5013242
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	2.8	0.50	5018546
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5018547

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B7B4147
Report Date: 2017/06/09

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

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Maxxam Job #: B7B4147
Report Date: 2017/06/09

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5013242	GKR	QC Standard	Total Suspended Solids	2017/06/06		99	%	85 - 115
5013242	GKR	Method Blank	Total Suspended Solids	2017/06/06	<1		mg/L	
5013242	GKR	RPD	Total Suspended Solids	2017/06/06	18		%	25
5013509	ZSK	Matrix Spike	Phenols-4AAP	2017/06/05		102	%	80 - 120
5013509	ZSK	Spiked Blank	Phenols-4AAP	2017/06/05		102	%	85 - 115
5013509	ZSK	Method Blank	Phenols-4AAP	2017/06/05	<0.0010		mg/L	
5013509	ZSK	RPD	Phenols-4AAP	2017/06/05	NC		%	20
5013763	TA1	Spiked Blank	pH	2017/06/06		102	%	98 - 103
5013763	TA1	RPD	pH	2017/06/06	0.27		%	N/A
5018546	FA	Spiked Blank	Total Oil & Grease	2017/06/08		98	%	85 - 115
5018546	FA	RPD	Total Oil & Grease	2017/06/08	4.7		%	25
5018546	FA	Method Blank	Total Oil & Grease	2017/06/08	<0.50		mg/L	
5018547	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/06/08		93	%	85 - 115
5018547	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/06/08	1.8		%	25
5018547	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/06/08	<0.50		mg/L	

N/A = Not Applicable

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Maxxam Job #: B7B4147
Report Date: 2017/06/09

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

VALIDATION SIGNATURE PAGE

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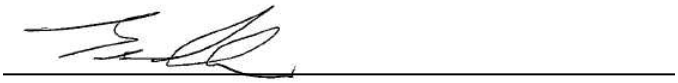

Brad Newman, Scientific Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-02-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/16
Report #: R4532920
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7B9678
Received: 2017/06/09, 09:12

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/06/15	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/06/14	2017/06/15	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/06/13	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/06/14	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/06/14	2017/06/15	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/06/12	2017/06/12	CAM SOP-00428	SM 22 2540D m

Remarks:

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Results relate to samples tested.

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

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-02-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/16
Report #: R4532920
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7B9678
Received: 2017/06/09, 09:12

Encryption Key

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Email: ABrasil@maxxam.ca
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Maxxam Job #: B7B9678
Report Date: 2017/06/16

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		ENM780		
Sampling Date		2017/06/08 12:30		
COC Number		587674-02-01		
	UNITS	**POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	1.9	0.50	5020985
Inorganics				
pH	pH	8.41	N/A	5025661
Phenols-4AAP	mg/L	<0.0010	0.0010	5028076
Total Suspended Solids	mg/L	5	1	5023322
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	1.9	0.50	5027289
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5027294

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7B9678
Report Date: 2017/06/16

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

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Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7B9678
Report Date: 2017/06/16

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5023322	RAY	QC Standard	Total Suspended Solids	2017/06/12		96	%	85 - 115
5023322	RAY	Method Blank	Total Suspended Solids	2017/06/12	<1		mg/L	
5023322	RAY	RPD	Total Suspended Solids	2017/06/12	NC		%	25
5025661	TA1	Spiked Blank	pH	2017/06/13		102	%	98 - 103
5025661	TA1	RPD	pH	2017/06/13	0.22		%	N/A
5027289	FA	Spiked Blank	Total Oil & Grease	2017/06/15		99	%	85 - 115
5027289	FA	RPD	Total Oil & Grease	2017/06/15	4.0		%	25
5027289	FA	Method Blank	Total Oil & Grease	2017/06/15	<0.50		mg/L	
5027294	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/06/15		91	%	85 - 115
5027294	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/06/15	4.2		%	25
5027294	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/06/15	<0.50		mg/L	
5028076	ZSK	Matrix Spike	Phenols-4AAP	2017/06/14		98	%	80 - 120
5028076	ZSK	Spiked Blank	Phenols-4AAP	2017/06/14		98	%	85 - 115
5028076	ZSK	Method Blank	Phenols-4AAP	2017/06/14	<0.0010		mg/L	
5028076	ZSK	RPD	Phenols-4AAP	2017/06/14	NC		%	20

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Maxxam Job #: B7B9678
Report Date: 2017/06/16

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

VALIDATION SIGNATURE PAGE

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Cristina Carriere

Cristina Carriere, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/29
Report #: R4565812
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7D1805
Received: 2017/06/23, 09:25

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/06/28	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/06/28	2017/06/28	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/06/26	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/06/26	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/06/28	2017/06/28	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/06/24	2017/06/24	CAM SOP-00428	SM 22 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

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/06/29
Report #: R4565812
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7D1805
Received: 2017/06/23, 09:25

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7D1805
Report Date: 2017/06/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		EPT328		
Sampling Date		2017/06/22 12:30		
COC Number		587674-03-01		
	UNITS	**590331 POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	2.0	0.50	5042685
Inorganics				
pH	pH	9.11	N/A	5044696
Phenols-4AAP	mg/L	<0.0010	0.0010	5046029
Total Suspended Solids	mg/L	5	1	5044539
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	2.0	0.50	5049421
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5049426

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B7D1805
Report Date: 2017/06/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

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Maxxam Job #: B7D1805
Report Date: 2017/06/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5044539	XZH	QC Standard	Total Suspended Solids	2017/06/24		99	%	85 - 115
5044539	XZH	Method Blank	Total Suspended Solids	2017/06/24	<1		mg/L	
5044539	XZH	RPD	Total Suspended Solids	2017/06/24	15		%	25
5044696	TA1	Spiked Blank	pH	2017/06/26		102	%	98 - 103
5044696	TA1	RPD	pH	2017/06/26	1.8		%	N/A
5046029	ZSK	Matrix Spike	Phenols-4AAP	2017/06/26		106	%	80 - 120
5046029	ZSK	Spiked Blank	Phenols-4AAP	2017/06/26		98	%	85 - 115
5046029	ZSK	Method Blank	Phenols-4AAP	2017/06/26	<0.0010		mg/L	
5046029	ZSK	RPD	Phenols-4AAP	2017/06/26	5.0		%	20
5049421	MA4	Spiked Blank	Total Oil & Grease	2017/06/28		97	%	85 - 115
5049421	MA4	RPD	Total Oil & Grease	2017/06/28	2.9		%	25
5049421	MA4	Method Blank	Total Oil & Grease	2017/06/28	<0.50		mg/L	
5049426	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/06/28		94	%	85 - 115
5049426	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2017/06/28	0.58		%	25
5049426	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/06/28	<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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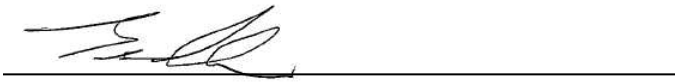
Maxxam Job #: B7D1805
Report Date: 2017/06/29

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

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 Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/06
Report #: R4579638
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7D8015
Received: 2017/06/30, 09:01

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/07/06	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/07/06	2017/07/06	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/07/04	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/07/05	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/07/06	2017/07/06	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/07/01	2017/07/01	CAM SOP-00428	SM 22 2540D m

Remarks:

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 587674-05-01

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Golder Associates Ltd
121 Commerce Park Drive
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Report Date: 2017/07/06
Report #: R4579638
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7D8015
Received: 2017/06/30, 09:01

Encryption Key

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Email: ABrasil@maxxam.ca
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Maxxam Job #: B7D8015
Report Date: 2017/07/06

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		EQY663	EQY663		
Sampling Date		2017/06/29 12:30	2017/06/29 12:30		
COC Number		587674-05-01	587674-05-01		
	UNITS	590331 POND	590331 POND Lab-Dup	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	N/A	0.50	5053394
Inorganics					
pH	pH	8.68	N/A	N/A	5056437
Phenols-4AAP	mg/L	<0.0010	N/A	0.0010	5058568
Total Suspended Solids	mg/L	2	2	1	5055261
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	<0.50	N/A	0.50	5060199
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	N/A	0.50	5060201

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B7D8015
Report Date: 2017/07/06

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

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Maxxam Job #: B7D8015
Report Date: 2017/07/06

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5055261	XZH	QC Standard	Total Suspended Solids	2017/07/01		97	%	85 - 115
5055261	XZH	Method Blank	Total Suspended Solids	2017/07/01	<1		mg/L	
5055261	XZH	RPD [EQY663-03]	Total Suspended Solids	2017/07/01	8.7		%	25
5056437	TA1	Spiked Blank	pH	2017/07/04		102	%	98 - 103
5056437	TA1	RPD	pH	2017/07/04	0.38		%	N/A
5058568	ZSK	Matrix Spike	Phenols-4AAP	2017/07/05		100	%	80 - 120
5058568	ZSK	Spiked Blank	Phenols-4AAP	2017/07/05		97	%	85 - 115
5058568	ZSK	Method Blank	Phenols-4AAP	2017/07/05	<0.0010		mg/L	
5058568	ZSK	RPD	Phenols-4AAP	2017/07/05	NC		%	20
5060199	MA4	Spiked Blank	Total Oil & Grease	2017/07/06		97	%	85 - 115
5060199	MA4	RPD	Total Oil & Grease	2017/07/06	0.87		%	25
5060199	MA4	Method Blank	Total Oil & Grease	2017/07/06	<0.50		mg/L	
5060201	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/07/06		94	%	85 - 115
5060201	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2017/07/06	0.58		%	25
5060201	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/07/06	<0.50		mg/L	

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Maxxam Job #: B7D8015
Report Date: 2017/07/06

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

VALIDATION SIGNATURE PAGE

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Cristina Carriere

Cristina Carriere, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 533889-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/13
Report #: R4595658
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E3144
Received: 2017/07/07, 09:26

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/07/12	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/07/11	2017/07/12	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/07/10	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/07/10	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/07/11	2017/07/12	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/07/10	2017/07/10	CAM SOP-00428	SM 22 2540D m

Remarks:

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 533889-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/13
Report #: R4595658
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E3144
Received: 2017/07/07, 09:26

Encryption Key

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Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
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Maxxam Job #: B7E3144
Report Date: 2017/07/13

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		ERY093		
Sampling Date		2017/07/06 12:30		
COC Number		533889-01-01		
	UNITS	**590331 POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	5062294
Inorganics				
pH	pH	8.36	N/A	5064392
Phenols-4AAP	mg/L	<0.0010	0.0010	5065820
Total Suspended Solids	mg/L	3	1	5065445
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	5067982
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5067989

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7E3144
Report Date: 2017/07/13

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

GENERAL COMMENTS

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Maxxam Job #: B7E3144
Report Date: 2017/07/13

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5064392	TA1	Spiked Blank	pH	2017/07/10		101	%	98 - 103
5064392	TA1	RPD	pH	2017/07/10	0.64		%	N/A
5065445	RAY	QC Standard	Total Suspended Solids	2017/07/10		100	%	85 - 115
5065445	RAY	Method Blank	Total Suspended Solids	2017/07/10	<1		mg/L	
5065445	RAY	RPD	Total Suspended Solids	2017/07/10	20		%	25
5065820	ZSK	Matrix Spike	Phenols-4AAP	2017/07/10		109	%	80 - 120
5065820	ZSK	Spiked Blank	Phenols-4AAP	2017/07/10		103	%	85 - 115
5065820	ZSK	Method Blank	Phenols-4AAP	2017/07/10	<0.0010		mg/L	
5065820	ZSK	RPD	Phenols-4AAP	2017/07/10	NC		%	20
5067982	AMJ	Matrix Spike	Total Oil & Grease	2017/07/12		98	%	75 - 125
5067982	AMJ	Spiked Blank	Total Oil & Grease	2017/07/12		102	%	85 - 115
5067982	AMJ	RPD	Total Oil & Grease	2017/07/12	5.0		%	25
5067982	AMJ	Method Blank	Total Oil & Grease	2017/07/12	<0.50		mg/L	
5067989	AMJ	Matrix Spike	Total Oil & Grease Mineral/Synthetic	2017/07/12		93	%	75 - 125
5067989	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/07/12		97	%	85 - 115
5067989	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2017/07/12	4.1		%	25
5067989	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/07/12	<0.50		mg/L	

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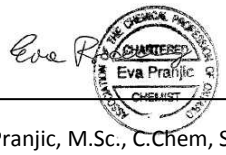
Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7E3144
Report Date: 2017/07/13

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

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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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: McCarthy
Your C.O.C. #: 618755-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/21
Report #: R4607058
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E9003
Received: 2017/07/14, 08:48

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/07/19	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/07/19	2017/07/19	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/07/19	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/07/18	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/07/19	2017/07/19	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/07/15	2017/07/15	CAM SOP-00428	SM 22 2540D m

Remarks:

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Results relate to samples tested.

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

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Your Project #: 1407634
Site#: 1407634
Site Location: McCarthy
Your C.O.C. #: 618755-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/21
Report #: R4607058
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7E9003
Received: 2017/07/14, 08:48

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7E9003
Report Date: 2017/07/21

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		ETB388	ETB388		
Sampling Date		2017/07/13 12:00	2017/07/13 12:00		
COC Number		618755-01-01	618755-01-01		
	UNITS	590331	590331 Lab-Dup	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	4.1	N/A	0.50	5073253
Inorganics					
pH	pH	8.47	N/A	N/A	5078236
Phenols-4AAP	mg/L	<0.0010	<0.0010	0.0010	5078127
Total Suspended Solids	mg/L	6	N/A	1	5075127
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	4.1	N/A	0.50	5079826
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	N/A	0.50	5079833

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B7E9003
Report Date: 2017/07/21

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

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B7E9003
Report Date: 2017/07/21

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5075127	XZH	QC Standard	Total Suspended Solids	2017/07/15		97	%	85 - 115
5075127	XZH	Method Blank	Total Suspended Solids	2017/07/15	<1		mg/L	
5075127	XZH	RPD	Total Suspended Solids	2017/07/15	16		%	25
5078127	ZSK	Matrix Spike [ETB388-04]	Phenols-4AAP	2017/07/18		100	%	80 - 120
5078127	ZSK	Spiked Blank	Phenols-4AAP	2017/07/18		100	%	85 - 115
5078127	ZSK	Method Blank	Phenols-4AAP	2017/07/18	<0.0010		mg/L	
5078127	ZSK	RPD [ETB388-04]	Phenols-4AAP	2017/07/18	NC		%	20
5078236	TA1	Spiked Blank	pH	2017/07/19		102	%	98 - 103
5078236	TA1	RPD	pH	2017/07/19	0.84		%	N/A
5079826	FA	Spiked Blank	Total Oil & Grease	2017/07/19		98	%	85 - 115
5079826	FA	RPD	Total Oil & Grease	2017/07/19	4.0		%	25
5079826	FA	Method Blank	Total Oil & Grease	2017/07/19	<0.50		mg/L	
5079833	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/07/19		96	%	85 - 115
5079833	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/07/19	2.3		%	25
5079833	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/07/19	<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).

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Maxxam Job #: B7E9003
Report Date: 2017/07/21

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

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, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: McCarthy
Site Location: McCarthy
Your C.O.C. #: 618758-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/26
Report #: R4615868
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7F5351
Received: 2017/07/21, 09:32

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/07/25	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/07/25	2017/07/25	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/07/24	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/07/24	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/07/25	2017/07/25	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/07/22	2017/07/22	CAM SOP-00428	SM 22 2540D m

Remarks:

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Results relate to samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
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Your Project #: 1407634
Site#: McCarthy
Site Location: McCarthy
Your C.O.C. #: 618758-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/07/26
Report #: R4615868
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7F5351
Received: 2017/07/21, 09:32

Encryption Key

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Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7F5351
Report Date: 2017/07/26

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy

RESULTS OF ANALYSES OF WATER

Maxxam ID		EUG308		
Sampling Date		2017/07/20 12:00		
COC Number		618758-01-01		
	UNITS	**POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	1.6	0.50	5084414
Inorganics				
pH	pH	7.96	N/A	5086473
Phenols-4AAP	mg/L	<0.0010	0.0010	5087618
Total Suspended Solids	mg/L	4	1	5086334
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	1.6	0.50	5088604
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5088606

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B7F5351
Report Date: 2017/07/26

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy

GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7F5351
Report Date: 2017/07/26

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5086334	XZH	QC Standard	Total Suspended Solids	2017/07/22		95	%	85 - 115
5086334	XZH	Method Blank	Total Suspended Solids	2017/07/22	<1		mg/L	
5086334	XZH	RPD	Total Suspended Solids	2017/07/22	4.9		%	25
5086473	TA1	Spiked Blank	pH	2017/07/24		102	%	98 - 103
5086473	TA1	RPD	pH	2017/07/24	0.11		%	N/A
5087618	ZSK	Matrix Spike	Phenols-4AAP	2017/07/24		100	%	80 - 120
5087618	ZSK	Spiked Blank	Phenols-4AAP	2017/07/24		97	%	85 - 115
5087618	ZSK	Method Blank	Phenols-4AAP	2017/07/24	<0.0010		mg/L	
5087618	ZSK	RPD	Phenols-4AAP	2017/07/24	NC		%	20
5088604	FA	Spiked Blank	Total Oil & Grease	2017/07/25		98	%	85 - 115
5088604	FA	RPD	Total Oil & Grease	2017/07/25	4.4		%	25
5088604	FA	Method Blank	Total Oil & Grease	2017/07/25	<0.50		mg/L	
5088606	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/07/25		94	%	85 - 115
5088606	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/07/25	4.2		%	25
5088606	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/07/25	<0.50		mg/L	

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Maxxam Job #: B7F5351
Report Date: 2017/07/26

Golder Associates Ltd
Client Project #: 1407634
Site Location: McCarthy

VALIDATION SIGNATURE PAGE

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Cristina Carriere, Scientific Services

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: McCarthy
Your C.O.C. #: 618759-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/08/04
Report #: R4632704
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7G1318
Received: 2017/07/28, 09:52

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/07/31	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/07/31	2017/07/31	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/07/31	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/08/02	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/07/31	2017/07/31	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/07/29	2017/07/31	CAM SOP-00428	SM 22 2540D m

Remarks:

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Results relate to samples tested.

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Your Project #: 1407634
Site#: 1407634
Site Location: McCarthy
Your C.O.C. #: 618759-01-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/08/04
Report #: R4632704
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7G1318
Received: 2017/07/28, 09:52

Encryption Key

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Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B7G1318
Report Date: 2017/08/04

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		EVL627	EVL627		
Sampling Date		2017/07/27 12:00	2017/07/27 12:00		
COC Number		618759-01-01	618759-01-01		
	UNITS	590331 POND	590331 POND Lab-Dup	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	0.90	N/A	0.50	5095138
Inorganics					
pH	pH	8.46	N/A	N/A	5097260
Phenols-4AAP	mg/L	<0.0010	N/A	0.0010	5102160
Total Suspended Solids	mg/L	3	2	1	5097100
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	0.90	N/A	0.50	5098578
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	N/A	0.50	5098591

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7G1318
Report Date: 2017/08/04

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

GENERAL COMMENTS

Sample received with temp >10C and analyses conducted with client's consent.

Results relate only to the items tested.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7G1318
Report Date: 2017/08/04

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5097100	RAY	QC Standard	Total Suspended Solids	2017/07/31		101	%	85 - 115
5097100	RAY	Method Blank	Total Suspended Solids	2017/07/31	<1		mg/L	
5097100	RAY	RPD [EVL627-03]	Total Suspended Solids	2017/07/31	8.0		%	25
5097260	TA1	Spiked Blank	pH	2017/07/31		102	%	98 - 103
5097260	TA1	RPD	pH	2017/07/31	0.060		%	N/A
5098578	FA	Spiked Blank	Total Oil & Grease	2017/07/31		100	%	85 - 115
5098578	FA	RPD	Total Oil & Grease	2017/07/31	4.0		%	25
5098578	FA	Method Blank	Total Oil & Grease	2017/07/31	<0.50		mg/L	
5098591	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/07/31		92	%	85 - 115
5098591	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/07/31	1.8		%	25
5098591	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/07/31	<0.50		mg/L	
5102160	ZSK	Matrix Spike	Phenols-4AAP	2017/08/02		99	%	80 - 120
5102160	ZSK	Spiked Blank	Phenols-4AAP	2017/08/02		102	%	85 - 115
5102160	ZSK	Method Blank	Phenols-4AAP	2017/08/02	<0.0010		mg/L	
5102160	ZSK	RPD	Phenols-4AAP	2017/08/02	NC		%	20

N/A = Not Applicable

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

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

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

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Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7G1318
Report Date: 2017/08/04

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

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 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.

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 590331-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/12
Report #: R4457732
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B791836
Received: 2017/05/05, 09:05

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/05/11	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/05/11	2017/05/11	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/05/10	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/05/09	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/05/11	2017/05/11	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/05/08	2017/05/09	CAM SOP-00428	SM 22 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.

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

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 590331-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/12
Report #: R4457732
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B791836
Received: 2017/05/05, 09:05

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

==========

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Maxxam Job #: B791836
Report Date: 2017/05/12

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

RESULTS OF ANALYSES OF WATER

Maxxam ID		EII944		
Sampling Date		2017/05/04 12:00		
COC Number		590331-03-01		
	UNITS	**590331 POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	4970025
Inorganics				
pH	pH	7.77	N/A	4976646
Phenols-4AAP	mg/L	<0.0010	0.0010	4975482
Total Suspended Solids	mg/L	3	1	4973210
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	4978822
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	4978832

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B791836
Report Date: 2017/05/12

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B791836
Report Date: 2017/05/12

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4973210	AS6	QC Standard	Total Suspended Solids	2017/05/09		100	%	85 - 115
4973210	AS6	Method Blank	Total Suspended Solids	2017/05/09	<1		mg/L	
4973210	AS6	RPD	Total Suspended Solids	2017/05/09	5.4		%	25
4975482	ZSK	Matrix Spike	Phenols-4AAP	2017/05/09		104	%	80 - 120
4975482	ZSK	Spiked Blank	Phenols-4AAP	2017/05/09		101	%	85 - 115
4975482	ZSK	Method Blank	Phenols-4AAP	2017/05/09	<0.0010		mg/L	
4975482	ZSK	RPD	Phenols-4AAP	2017/05/09	NC		%	20
4976646	SAU	Spiked Blank	pH	2017/05/10		102	%	98 - 103
4976646	SAU	RPD	pH	2017/05/10	0.16		%	N/A
4978822	AMJ	Spiked Blank	Total Oil & Grease	2017/05/11		96	%	85 - 115
4978822	AMJ	RPD	Total Oil & Grease	2017/05/11	1.1		%	25
4978822	AMJ	Method Blank	Total Oil & Grease	2017/05/11	<0.50		mg/L	
4978832	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/05/11		94	%	85 - 115
4978832	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2017/05/11	1.2		%	25
4978832	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/05/11	<0.50		mg/L	

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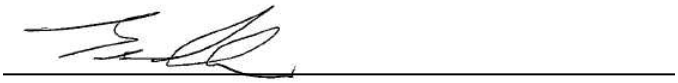
Maxxam Job #: B791836
Report Date: 2017/05/12

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY

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 Specialist

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 554700-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/23
Report #: R4477265
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B797815
Received: 2017/05/13, 09:15

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/05/20	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/05/17	2017/05/18	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/05/17	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/05/17	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/05/20	2017/05/20	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/05/20	2017/05/20	CAM SOP-00428	SM 22 2540D m

Remarks:

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Results relate to samples tested.

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

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Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 554700-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/05/23
Report #: R4477265
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B797815
Received: 2017/05/13, 09:15

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Antonella Brasil, Senior Project Manager
Email: ABrasil@maxxam.ca
Phone# (905)817-5817

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Maxxam Job #: B797815
Report Date: 2017/05/23

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		EJL023		EJL023	
Sampling Date		2017/05/11 12:30		2017/05/11 12:30	
COC Number		554700-04-01		554700-04-01	
	UNITS	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	1.3	0.50	N/A	4990979
Inorganics					
pH	pH	8.43	N/A	8.25	4986179
Phenols-4AAP	mg/L	<0.0010	0.0010	N/A	4985391
Total Suspended Solids	mg/L	5	1	N/A	4992030
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	1.3	0.50	N/A	4987006
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	N/A	4992847

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B797815
Report Date: 2017/05/23

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

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B797815
Report Date: 2017/05/23

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4985391	ZSK	Matrix Spike	Phenols-4AAP	2017/05/17		101	%	80 - 120
4985391	ZSK	Spiked Blank	Phenols-4AAP	2017/05/17		102	%	85 - 115
4985391	ZSK	Method Blank	Phenols-4AAP	2017/05/17	<0.0010		mg/L	
4985391	ZSK	RPD	Phenols-4AAP	2017/05/17	NC		%	20
4986179	SAU	Spiked Blank	pH	2017/05/17		103	%	98 - 103
4986179	SAU	RPD [EJL023-02]	pH	2017/05/17	2.1		%	N/A
4987006	FA	Matrix Spike	Total Oil & Grease	2017/05/18		90	%	75 - 125
4987006	FA	Spiked Blank	Total Oil & Grease	2017/05/18		101	%	85 - 115
4987006	FA	RPD	Total Oil & Grease	2017/05/18	2.8		%	25
4987006	FA	Method Blank	Total Oil & Grease	2017/05/18	<0.50		mg/L	
4992030	AS6	QC Standard	Total Suspended Solids	2017/05/20		98	%	85 - 115
4992030	AS6	Method Blank	Total Suspended Solids	2017/05/20	<1		mg/L	
4992030	AS6	RPD	Total Suspended Solids	2017/05/20	6.5		%	25
4992847	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/05/20		93	%	85 - 115
4992847	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/05/20	3.0		%	25
4992847	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/05/20	<0.50		mg/L	

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Maxxam Job #: B797815
Report Date: 2017/05/23

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

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, Scientific Services

Eva Pranjic

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

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Your Project #: 1407634
Site Location: MCCARTHY- COCO
Your C.O.C. #: 611508-01-01

Attention:Jamie Bonany

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

Report Date: 2017/05/31
Report #: R4494426
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A5755
Received: 2017/05/24, 10:15

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2017/05/30	CAM SOP-00448	SM 22 2320 B m
Chloride by Automated Colourimetry	3	N/A	2017/05/29	CAM SOP-00463	EPA 325.2 m
Conductivity	3	N/A	2017/05/30	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2017/05/26	CAM SOP-00446	SM 22 5310 B m
Fluoride	3	2017/05/27	2017/05/30	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2017/05/30	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals Analysis by ICP	3	2017/05/27	2017/05/29	CAM SOP-00408	EPA 6010D m
Total Metals Analysis by ICPMS	3	N/A	2017/05/26	CAM SOP-00447	EPA 6020B m
Anion and Cation Sum	3	N/A	2017/05/30		
Total Ammonia-N	3	N/A	2017/05/30	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2017/05/29	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Total Oil and Grease	3	2017/05/25	2017/05/25	CAM SOP-00326	EPA1664B m,SM5520A m
pH	3	N/A	2017/05/30	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2017/05/29	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	3	N/A	2017/05/29	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	3	2017/05/26	2017/05/26	CAM SOP-00428	SM 22 2540C m
Total Kjeldahl Nitrogen in Water	2	2017/05/26	2017/05/29	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2017/05/27	2017/05/28	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	2	2017/05/31	2017/05/31	CAM SOP-00407	SM 22 4500 P B H m
Total Phosphorus (Colourimetric)	1	2017/05/26	2017/05/29	CAM SOP-00407	SM 22 4500 P B H m
Total Suspended Solids	3	2017/05/26	2017/05/26	CAM SOP-00428	SM 22 2540D m

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Your Project #: 1407634
Site Location: MCCARTHY- COCO
Your C.O.C. #: 611508-01-01

Attention:Jamie Bonany

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

Report Date: 2017/05/31
Report #: R4494426
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7A5755
Received: 2017/05/24, 10:15

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.

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.
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) 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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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.

Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

RESULTS OF ANALYSES OF WATER

Maxxam ID			EKW691		EKW692			EKW693		
Sampling Date			2017/05/23 14:30		2017/05/23 12:00			2017/05/23 10:20		
COC Number			611508-01-01		611508-01-01			611508-01-01		
	UNITS	Criteria	POND	QC Batch	SW1	RDL	QC Batch	SW2	RDL	QC Batch
Calculated Parameters										
Anion Sum	me/L	-	10.1	4997030	9.82	N/A	4997030	6.31	N/A	4997030
Cation Sum	me/L	-	10.3	4997030	10.3	N/A	4997030	6.52	N/A	4997030
Hardness (CaCO3)	mg/L	-	300	4996097	300	1.0	4996097	310	1.0	4996097
Inorganics										
Total Ammonia-N	mg/L	-	<0.050	5000869	<0.050	0.050	5000869	<0.050	0.050	5000869
Conductivity	mS/cm	-	1.01	5002303	0.988	0.001	5002303	0.570	0.001	5002303
Total Dissolved Solids	mg/L	-	638	5000102	622	10	5000102	362	10	5000102
Fluoride (F-)	mg/L	-	0.58	5002304	0.55	0.10	5002304	0.10	0.10	5002304
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.26	5001830	0.51	0.10	5000971	0.62	0.10	5000971
Dissolved Organic Carbon	mg/L	-	3.8	4999164	3.7	0.20	4999164	13	0.20	4999164
pH	pH	6.5:8.5	8.10	5002305	8.01		5002305	8.04		5002305
Phenols-4AAP	mg/L	0.001	<0.0010	5003108	<0.0010	0.0010	5003108	<0.0010	0.0010	5003108
Total Phosphorus	mg/L	0.01	**0.012**	5006286	**0.016**	0.004	5006286	**0.035**	0.020	5000571
Total Suspended Solids	mg/L	-	<10	5000098	<10	10	5000098	12	10	5000098
Dissolved Sulphate (SO4)	mg/L	-	260	5001303	240	1.0	5001303	22	1.0	5001303
Alkalinity (Total as CaCO3)	mg/L	-	110	5002302	120	1.0	5002302	280	1.0	5002302
Dissolved Chloride (Cl)	mg/L	-	84	5001291	79	1.0	5001291	7.7	1.0	5001291
Nitrite (N)	mg/L	-	0.119	5001217	0.109	0.010	5001217	<0.010	0.010	5001217
Nitrate (N)	mg/L	-	2.91	5001217	2.80	0.10	5001217	<0.10	0.10	5001217
Nitrate + Nitrite (N)	mg/L	-	3.02	5001217	2.91	0.10	5001217	<0.10	0.10	5001217
Petroleum Hydrocarbons										
Total Oil & Grease	mg/L	-	<0.50	4998299	<0.50	0.50	4998299	<0.50	0.50	4998299

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

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca

Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			EKW691	EKW691	EKW692		EKW693		
Sampling Date			2017/05/23 14:30	2017/05/23 14:30	2017/05/23 12:00		2017/05/23 10:20		
COC Number			611508-01-01	611508-01-01	611508-01-01		611508-01-01		
	UNITS	Criteria	POND	POND Lab-Dup	SW1	QC Batch	SW2	RDL	QC Batch
Metals									
Dissolved Calcium (Ca)	mg/L	-	70		73	5002296	110	0.05	5002296
Dissolved Magnesium (Mg)	mg/L	-	30		30	5002296	6.5	0.05	5002296
Dissolved Potassium (K)	mg/L	-	12		12	5002296	3	1	5002296
Dissolved Sodium (Na)	mg/L	-	92		90	5002296	6.9	0.5	5002296
Total Arsenic (As)	ug/L	100	<1.0	<1.0	<1.0	5000162	<1.0	1.0	5000162
Total Cadmium (Cd)	ug/L	0.2	<0.10	<0.10	<0.10	5000162	<0.10	0.10	5000162
Total Calcium (Ca)	ug/L	-	64000	66000	68000	5000162	110000	200	5000162
Total Chromium (Cr)	ug/L	-	<5.0	<5.0	<5.0	5000162	<5.0	5.0	5000162
Total Copper (Cu)	ug/L	5	<1.0		<1.0	5003241	<1.0	1.0	5000162
Total Iron (Fe)	ug/L	300	<100	<100	<100	5000162	**310**	100	5000162
Total Lead (Pb)	ug/L	5	<0.50	<0.50	<0.50	5000162	<0.50	0.50	5000162
Total Magnesium (Mg)	ug/L	-	29000	29000	28000	5000162	6400	50	5000162
Total Manganese (Mn)	ug/L	-	10	11	14	5000162	62	2.0	5000162
Total Nickel (Ni)	ug/L	25	1.5	1.5	1.3	5000162	<1.0	1.0	5000162
Total Potassium (K)	ug/L	-	11000	11000	11000	5000162	2200	200	5000162
Total Sodium (Na)	ug/L	-	85000	86000	83000	5000162	6200	100	5000162
Total Zinc (Zn)	ug/L	30	<5.0	<5.0	<5.0	5000162	5.0	5.0	5000162

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

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Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: EKW691
Sample ID: POND
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5002302	N/A	2017/05/30	Surinder Rai
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Conductivity	AT	5002303	N/A	2017/05/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999164	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5002304	2017/05/27	2017/05/30	Surinder Rai
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5002296	2017/05/27	2017/05/29	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5000162	N/A	2017/05/26	Arefa Dabhad
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5000869	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
Total Oil and Grease	BAL	4998299	2017/05/25	2017/05/25	Amjad Mir
pH	AT	5002305	N/A	2017/05/30	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5003108	N/A	2017/05/29	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids	BAL	5000102	2017/05/26	2017/05/26	Xue Zheng Li(Scott)
Total Kjeldahl Nitrogen in Water	SKAL	5001830	2017/05/27	2017/05/28	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5006286	2017/05/31	2017/05/31	Amanpreet Sappal
Total Suspended Solids	BAL	5000098	2017/05/26	2017/05/26	Lu Wang(Alice)

Maxxam ID: EKW691 Dup
Sample ID: POND
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Metals Analysis by ICPMS	ICP/MS	5000162	N/A	2017/05/26	Arefa Dabhad

Maxxam ID: EKW692
Sample ID: SW1
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5002302	N/A	2017/05/30	Surinder Rai
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Conductivity	AT	5002303	N/A	2017/05/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999164	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5002304	2017/05/27	2017/05/30	Surinder Rai
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5002296	2017/05/27	2017/05/29	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5000162	N/A	2017/05/26	Arefa Dabhad
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5000869	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
Total Oil and Grease	BAL	4998299	2017/05/25	2017/05/25	Amjad Mir

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Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

TEST SUMMARY

Maxxam ID: EKW692
Sample ID: SW1
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
pH	AT	5002305	N/A	2017/05/30	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5003108	N/A	2017/05/29	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids	BAL	5000102	2017/05/26	2017/05/26	Xue Zheng Li(Scott)
Total Kjeldahl Nitrogen in Water	SKAL	5000971	2017/05/26	2017/05/29	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5006286	2017/05/31	2017/05/31	Amanpreet Sappal
Total Suspended Solids	BAL	5000098	2017/05/26	2017/05/26	Lu Wang(Alice)

Maxxam ID: EKW693
Sample ID: SW2
Matrix: Water

Collected: 2017/05/23
Shipped:
Received: 2017/05/24

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5002302	N/A	2017/05/30	Surinder Rai
Chloride by Automated Colourimetry	KONE	5001291	N/A	2017/05/29	Deonarine Ramnarine
Conductivity	AT	5002303	N/A	2017/05/30	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	4999164	N/A	2017/05/26	Anastasia Hamanov
Fluoride	ISE	5002304	2017/05/27	2017/05/30	Surinder Rai
Hardness (calculated as CaCO3)		4996097	N/A	2017/05/30	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5002296	2017/05/27	2017/05/29	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5000162	N/A	2017/05/26	Arefa Dabhad
Anion and Cation Sum	CALC	4997030	N/A	2017/05/30	Automated Statchk
Total Ammonia-N	LACH/NH4	5000869	N/A	2017/05/30	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5001217	N/A	2017/05/29	Chandra Nandlal
Total Oil and Grease	BAL	4998299	2017/05/25	2017/05/25	Amjad Mir
pH	AT	5002305	N/A	2017/05/30	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5003108	N/A	2017/05/29	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5001303	N/A	2017/05/29	Deonarine Ramnarine
Total Dissolved Solids	BAL	5000102	2017/05/26	2017/05/26	Xue Zheng Li(Scott)
Total Kjeldahl Nitrogen in Water	SKAL	5000971	2017/05/26	2017/05/29	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5000571	2017/05/26	2017/05/29	Amanpreet Sappal
Total Suspended Solids	BAL	5000098	2017/05/26	2017/05/26	Lu Wang(Alice)

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Golder Associates Ltd
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GENERAL COMMENTS

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

Package 1	5.3°C
Package 2	3.3°C
Package 3	3.3°C

Sample EKW691, Total Metals Analysis by ICPMS: Test repeated.
Sample EKW692, Total Metals Analysis by ICPMS: Test repeated.

Results relate only to the items tested.

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Site Location: MCCARTHY- COCO
Sampler Initials: DEH

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4998299	AMJ	Spiked Blank	Total Oil & Grease	2017/05/25		101	%	85 - 115
4998299	AMJ	RPD	Total Oil & Grease	2017/05/25	4.5		%	25
4998299	AMJ	Method Blank	Total Oil & Grease	2017/05/25	<0.50		mg/L	
4999164	AHA	Matrix Spike	Dissolved Organic Carbon	2017/05/26		95	%	80 - 120
4999164	AHA	Spiked Blank	Dissolved Organic Carbon	2017/05/26		96	%	80 - 120
4999164	AHA	Method Blank	Dissolved Organic Carbon	2017/05/26	<0.20		mg/L	
4999164	AHA	RPD	Dissolved Organic Carbon	2017/05/26	0.51		%	20
5000098	LWA	QC Standard	Total Suspended Solids	2017/05/26		98	%	85 - 115
5000098	LWA	Method Blank	Total Suspended Solids	2017/05/26	<10		mg/L	
5000098	LWA	RPD	Total Suspended Solids	2017/05/26	NC		%	25
5000102	XZH	QC Standard	Total Dissolved Solids	2017/05/26		99	%	90 - 110
5000102	XZH	Method Blank	Total Dissolved Solids	2017/05/26	<10		mg/L	
5000102	XZH	RPD	Total Dissolved Solids	2017/05/26	1.1		%	25
5000162	ADA	Matrix Spike [EKW691-07]	Total Arsenic (As)	2017/05/26		100	%	80 - 120
			Total Cadmium (Cd)	2017/05/26		100	%	80 - 120
			Total Calcium (Ca)	2017/05/26		NC	%	80 - 120
			Total Chromium (Cr)	2017/05/26		102	%	80 - 120
			Total Copper (Cu)	2017/05/26		102	%	80 - 120
			Total Iron (Fe)	2017/05/26		98	%	80 - 120
			Total Lead (Pb)	2017/05/26		97	%	80 - 120
			Total Magnesium (Mg)	2017/05/26		NC	%	80 - 120
			Total Manganese (Mn)	2017/05/26		97	%	80 - 120
			Total Nickel (Ni)	2017/05/26		98	%	80 - 120
			Total Potassium (K)	2017/05/26		94	%	80 - 120
			Total Sodium (Na)	2017/05/26		NC	%	80 - 120
			Total Zinc (Zn)	2017/05/26		100	%	80 - 120
5000162	ADA	Spiked Blank	Total Arsenic (As)	2017/05/26		99	%	80 - 120
			Total Cadmium (Cd)	2017/05/26		100	%	80 - 120
			Total Calcium (Ca)	2017/05/26		94	%	80 - 120
			Total Chromium (Cr)	2017/05/26		100	%	80 - 120
			Total Copper (Cu)	2017/05/26		102	%	80 - 120
			Total Iron (Fe)	2017/05/26		99	%	80 - 120
			Total Lead (Pb)	2017/05/26		99	%	80 - 120
			Total Magnesium (Mg)	2017/05/26		96	%	80 - 120
			Total Manganese (Mn)	2017/05/26		96	%	80 - 120
			Total Nickel (Ni)	2017/05/26		100	%	80 - 120
			Total Potassium (K)	2017/05/26		96	%	80 - 120
			Total Sodium (Na)	2017/05/26		95	%	80 - 120
			Total Zinc (Zn)	2017/05/26		100	%	80 - 120
5000162	ADA	Method Blank	Total Arsenic (As)	2017/05/26	<1.0		ug/L	
			Total Cadmium (Cd)	2017/05/26	<0.10		ug/L	
			Total Calcium (Ca)	2017/05/26	<200		ug/L	
			Total Chromium (Cr)	2017/05/26	<5.0		ug/L	
			Total Copper (Cu)	2017/05/26	<1.0		ug/L	
			Total Iron (Fe)	2017/05/26	<100		ug/L	
			Total Lead (Pb)	2017/05/26	<0.50		ug/L	
			Total Magnesium (Mg)	2017/05/26	<50		ug/L	
			Total Manganese (Mn)	2017/05/26	<2.0		ug/L	
			Total Nickel (Ni)	2017/05/26	<1.0		ug/L	
			Total Potassium (K)	2017/05/26	<200		ug/L	
			Total Sodium (Na)	2017/05/26	<100		ug/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Zinc (Zn)	2017/05/26	<5.0		ug/L	
5000162	ADA	RPD [EKW691-07]	Total Arsenic (As)	2017/05/26	NC		%	20
			Total Cadmium (Cd)	2017/05/26	NC		%	20
			Total Calcium (Ca)	2017/05/26	4.4		%	20
			Total Chromium (Cr)	2017/05/26	NC		%	20
			Total Iron (Fe)	2017/05/26	NC		%	20
			Total Lead (Pb)	2017/05/26	NC		%	20
			Total Magnesium (Mg)	2017/05/26	1.2		%	20
			Total Manganese (Mn)	2017/05/26	5.5		%	20
			Total Nickel (Ni)	2017/05/26	3.1		%	20
			Total Potassium (K)	2017/05/26	1.5		%	20
			Total Sodium (Na)	2017/05/26	2.0		%	20
			Total Zinc (Zn)	2017/05/26	NC		%	20
5000571	ASP	Matrix Spike [EKW691-04]	Total Phosphorus	2017/05/29		97	%	80 - 120
5000571	ASP	QC Standard	Total Phosphorus	2017/05/29		98	%	80 - 120
5000571	ASP	Spiked Blank	Total Phosphorus	2017/05/29		97	%	80 - 120
5000571	ASP	Method Blank	Total Phosphorus	2017/05/29	<0.020		mg/L	
5000869	COP	Matrix Spike	Total Ammonia-N	2017/05/30		91	%	80 - 120
5000869	COP	Spiked Blank	Total Ammonia-N	2017/05/30		96	%	85 - 115
5000869	COP	Method Blank	Total Ammonia-N	2017/05/30	<0.050		mg/L	
5000869	COP	RPD	Total Ammonia-N	2017/05/30	NC		%	20
5000971	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2017/05/29		115	%	80 - 120
5000971	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2017/05/29		103	%	80 - 120
5000971	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2017/05/29		104	%	80 - 120
5000971	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2017/05/29	<0.10		mg/L	
5000971	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2017/05/29	NC		%	20
5001217	C_N	Matrix Spike	Nitrite (N)	2017/05/29		100	%	80 - 120
			Nitrate (N)	2017/05/29		109	%	80 - 120
5001217	C_N	Spiked Blank	Nitrite (N)	2017/05/29		97	%	80 - 120
			Nitrate (N)	2017/05/29		103	%	80 - 120
5001217	C_N	Method Blank	Nitrite (N)	2017/05/29	<0.010		mg/L	
			Nitrate (N)	2017/05/29	<0.10		mg/L	
5001217	C_N	RPD	Nitrite (N)	2017/05/29	NC		%	20
			Nitrate (N)	2017/05/29	NC		%	20
5001291	DRM	Matrix Spike	Dissolved Chloride (Cl)	2017/05/29		NC	%	80 - 120
5001291	DRM	Spiked Blank	Dissolved Chloride (Cl)	2017/05/29		105	%	80 - 120
5001291	DRM	Method Blank	Dissolved Chloride (Cl)	2017/05/29	<1.0		mg/L	
5001291	DRM	RPD	Dissolved Chloride (Cl)	2017/05/29	2.3		%	20
5001303	DRM	Matrix Spike	Dissolved Sulphate (SO4)	2017/05/29		110	%	75 - 125
5001303	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2017/05/29		103	%	80 - 120
5001303	DRM	Method Blank	Dissolved Sulphate (SO4)	2017/05/29	<1.0		mg/L	
5001303	DRM	RPD	Dissolved Sulphate (SO4)	2017/05/29	1.4		%	20
5001830	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2017/05/28		NC	%	80 - 120
5001830	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2017/05/28		97	%	80 - 120
5001830	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2017/05/28		96	%	80 - 120
5001830	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2017/05/28	<0.10		mg/L	
5001830	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2017/05/28	0.065		%	20
5002296	AFZ	Matrix Spike	Dissolved Calcium (Ca)	2017/05/29		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		NC	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		102	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		NC	%	80 - 120

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Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5002296	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2017/05/29		100	%	80 - 120
			Dissolved Magnesium (Mg)	2017/05/29		96	%	80 - 120
			Dissolved Potassium (K)	2017/05/29		101	%	80 - 120
			Dissolved Sodium (Na)	2017/05/29		99	%	80 - 120
5002296	AFZ	Method Blank	Dissolved Calcium (Ca)	2017/05/29	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2017/05/29	<0.05		mg/L	
			Dissolved Potassium (K)	2017/05/29	<1		mg/L	
			Dissolved Sodium (Na)	2017/05/29	<0.5		mg/L	
5002302	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2017/05/29		95	%	85 - 115
5002302	SAU	Method Blank	Alkalinity (Total as CaCO3)	2017/05/29	<1.0		mg/L	
5002302	SAU	RPD	Alkalinity (Total as CaCO3)	2017/05/30	0.42		%	20
5002303	SAU	Spiked Blank	Conductivity	2017/05/29		101	%	85 - 115
5002303	SAU	Method Blank	Conductivity	2017/05/29	<0.001		mS/cm	
5002303	SAU	RPD	Conductivity	2017/05/30	0.11		%	25
5002304	SAU	Matrix Spike	Fluoride (F-)	2017/05/29		83	%	80 - 120
5002304	SAU	Spiked Blank	Fluoride (F-)	2017/05/29		105	%	80 - 120
5002304	SAU	Method Blank	Fluoride (F-)	2017/05/29	<0.10		mg/L	
5002304	SAU	RPD	Fluoride (F-)	2017/05/29	0.93		%	20
5002305	SAU	Spiked Blank	pH	2017/05/29		101	%	98 - 103
5002305	SAU	RPD	pH	2017/05/30	0.61		%	N/A
5003108	ZSK	Matrix Spike	Phenols-4AAP	2017/05/29		104	%	80 - 120
5003108	ZSK	Spiked Blank	Phenols-4AAP	2017/05/29		101	%	85 - 115
5003108	ZSK	Method Blank	Phenols-4AAP	2017/05/29	<0.0010		mg/L	
5003108	ZSK	RPD	Phenols-4AAP	2017/05/29	NC		%	20
5003241	ADA	Matrix Spike	Total Copper (Cu)	2017/05/29		102	%	80 - 120
5003241	ADA	Spiked Blank	Total Copper (Cu)	2017/05/29		99	%	80 - 120
5003241	ADA	Method Blank	Total Copper (Cu)	2017/05/29	<1.0		ug/L	
5003241	ADA	RPD	Total Copper (Cu)	2017/05/30	2.3		%	20
5006286	ASP	Matrix Spike	Total Phosphorus	2017/05/31		103	%	80 - 120
5006286	ASP	QC Standard	Total Phosphorus	2017/05/31		101	%	80 - 120
5006286	ASP	Spiked Blank	Total Phosphorus	2017/05/31		99	%	80 - 120
5006286	ASP	Method Blank	Total Phosphorus	2017/05/31	<0.004		mg/L	
5006286	ASP	RPD	Total Phosphorus	2017/05/31	7.9		%	20

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).

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Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

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, Scientific Services

Eva Pranjic

Ewa Pranjic, 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.

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Maxxam Job #: B7A5755
Report Date: 2017/05/31

Golder Associates Ltd
Client Project #: 1407634
Site Location: MCCARTHY- COCO
Sampler Initials: DEH

Exceedence Summary Table – Prov. Water Quality Obj.

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
POND	EKW691-04	Total Phosphorus	0.01	0.012	0.004	mg/L
SW1	EKW692-04	Total Phosphorus	0.01	0.016	0.004	mg/L
SW2	EKW693-07	Total Iron (Fe)	300	310	100	ug/L
SW2	EKW693-04	Total Phosphorus	0.01	0.035	0.020	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.

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AGAT Laboratories

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CANADA H4S 1V9
TEL (514)337-1000
FAX (514)333-3046
http://www.agatlabs.com

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

ATTENTION TO: Dawn Hoyle

PROJECT: 1407634

AGAT WORK ORDER: 17M218416

ECOTOX ANALYSIS REVIEWED BY: Virginie Bérubé, biologiste

DATE REPORTED: 2017-07-25

VERSION*: 1

PAGES (INCLUDING COVER): 4

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.

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Certificate of Analysis

AGAT WORK ORDER: 17M218416

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Dawn Hoyle

SAMPLED BY:Dawn Hoyle

SAMPLING SITE:

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

DATE RECEIVED: 2017-05-24

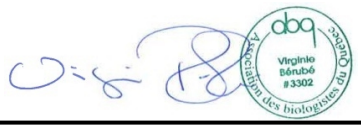
DATE REPORTED: 2017-07-25

		SAMPLE DESCRIPTION:		Pond
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2017-05-23
Parameter	Unit	G / S	RDL	8412806
Mortality 100% v/v	% mortality-48h			0
Acute Lethality				NO

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

8412806 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 17M218416

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Dawn Hoyle

SAMPLED BY:Dawn Hoyle

SAMPLING SITE:

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

DATE RECEIVED: 2017-05-24

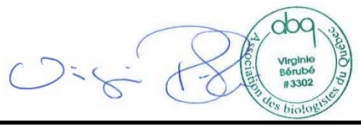
DATE REPORTED: 2017-07-25

		SAMPLE DESCRIPTION:		Pond
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2017-05-23
Parameter	Unit	G / S	RDL	8412806
Mortality 100% v/v	% mortality-96h			0
Acute Lethality				NO

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

8412806 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:



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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 17M218416

PROJECT: 1407634

ATTENTION TO: Dawn Hoyle

SAMPLED BY:Dawn Hoyle

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					

AGAT Laboratoires

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

À L'ATTENTION DE: Ryan Abrams

N° DE PROJET: 1407634 Macarthy

N° BON DE TRAVAIL: 17M236355

ÉCOTOX VÉRIFIÉ PAR: Virginie Bérubé, biologiste

DATE DU RAPPORT: 2017-07-27

VERSION*: 1

NOMBRE DE PAGES: 4

Si vous désirez de l'information concernant cette analyse, S.V.P. contacter votre chargé de projets au (514) 337-1000.

*NOTES

Nous disposerons des échantillons dans les 30 jours suivants les analyses. S.V.P. Contactez le laboratoire si vous désirez avoir un délai d'entreposage.

AGAT Laboratoires

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Certificat d'analyse

N° BON DE TRAVAIL: 17M236355

N° DE PROJET: 1407634 Macarthy

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Ryan Abrams

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Létalité-Daphnie (D. magna) CU-48h

DATE DE RÉCEPTION: 2017-07-12

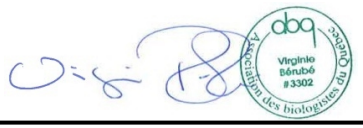
DATE DU RAPPORT: 2017-07-27

			IDENTIFICATION DE L'ÉCHANTILLON:	pond
			MATRICE:	Eau
			DATE D'ÉCHANTILLONNAGE:	2017-07-11
Paramètre	Unités	C / N	LDR	8549071
Mortalité 100% v/v	% mort-48h			0
Létalité aiguë				NO

Commentaires: LDR - Limite de détection rapportée; C / N - Critères Normes

8549071 Détails de l'analyse en annexe.
Légende conclusion:
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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Certificat d'analyse

N° BON DE TRAVAIL: 17M236355

N° DE PROJET: 1407634 Macarthy

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Ryan Abrams

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Létalité-Truite arc-en-ciel (O. mykiss) CU-96h

DATE DE RÉCEPTION: 2017-07-12

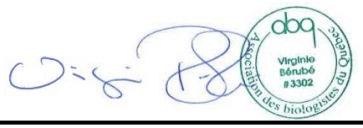
DATE DU RAPPORT: 2017-07-27

			IDENTIFICATION DE L'ÉCHANTILLON:	pond
			MATRICE:	Eau
			DATE D'ÉCHANTILLONNAGE:	2017-07-11
Paramètre	Unités	C / N	LDR	8549071
Mortalité 100% v/v	% mort-96h			0
Létalité aiguë				NO

Commentaires: LDR - Limite de détection rapportée; C / N - Critères Normes

8549071 Détails de l'analyse en annexe.
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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Sommaire de méthode

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

N° BON DE TRAVAIL: 17M236355

N° DE PROJET: 1407634 Macarthy

À L'ATTENTION DE: Ryan Abrams

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

PARAMÈTRE	PRÉPARÉ LE	ANALYSÉ LE	AGAT P.O.N.	RÉFÉRENCE DE LITTÉRATURE	TECHNIQUE ANALYTIQUE
Analyse écotox					
Mortalité 100% v/v					NA
Létalité aiguë					
Mortalité 100% v/v			ECO-152-20000F	SPE1/RM/13	
Létalité aiguë					

As a global, employee-owned organisation with over 50 years of experience, Golder Associates is driven by our purpose to engineer earth's development while preserving earth's integrity. We deliver solutions that help our clients achieve their sustainable development goals by providing a wide range of independent consulting, design and construction services in our specialist areas of earth, environment and energy.

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