



November 2014

## MCCARTHY QUARRY

# Environmental Compliance Approval Quarterly Monitoring Report (August to November)

**Submitted to:**

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

REPORT



**Report Number: 1407634**

**Distribution:**

1 Copy - Ontario Ministry of the Environment Barrie  
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1 Copy - Golder Associates Ltd.





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ECA NO  
4731-987KM8

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Water Quality Data



## **1.0 INTRODUCTION**

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare a quarterly compliance report for the McCarthy Quarry located in the Township of Ramara, County of Simcoe (Figure 1). The following report addresses the requirements described in Conditions 5, 7 and 8 of Environmental Compliance Approval (ECA) No. 4731-987KM8 issued on October 15, 2013. A copy of the ECA No. 4731-987KM8 is found in Appendix A.

This quarterly compliance report presents effluent monitoring results for the period between August 1, 2014 and November 1, 2014. 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 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, 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 through the 4-inch (101 mm) diameter pipe to the 14,000 m<sup>3</sup> settling pond. The settling pond is equipped with a Hickenbottom control structure and discharges 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 EFFLUENT MONITORING**

### **3.1 Effluent Monitoring Requirements**

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

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

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

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



The weekly effluent samples (Section 7(2)) were collected by Golder until October 1, 2014 when staff at the McCarthy Quarry began conducting the sampling. The semi-annual water quality samples (Section 7(3) and Section 7(7)) were collected by Golder and both the weekly and semi-annual water quality samples were sent to Maxxam Analytics Laboratory for analysis. During the October semi-annual effluent monitoring, a sample was not able to be collected from SW2 because it was dry. Additionally, the monthly lethality samples were collected by Golder and sent to AquaTox Testing & Consulting Inc.

### 3.2 Effluent Monitoring Results

Results for the weekly effluent monitoring are presented in Table 1; the monthly averages for the effluent monitoring are presented in Table 2; the semi-annual effluent monitoring results are presented in Table 3 and the acute lethality results are presented in Table 4. All laboratory certificates of analysis for the August to November monitoring period are included in Appendix B. Results were compared to the limits outlined Section 5 of the ECA.

Exceedances of the daily TSS limit of 30 mg/L occurred on August 15, 2014 and October 1, 2014 (Table 1) where TSS was 48 mg/L and 36 mg/L, respectively. The monthly TSS limit of 15 mg/L was also exceeded for the month of August at 17.6 mg/L (Table 2). These exceedances were reported to the District Manager Cindy Hood, via email. No other exceedances occurred during this monitoring period. The pH, Oil and Grease and Phenol (4AAP) concentrations were all below the daily and monthly concentration limits of the ECA.

The effluent was found to be non-lethal to rainbow trout and *Daphnia magna* between August and November, 2014 (Table 4).

The pump records for August to November, 2014 are found in Table 4. The discharge rate between August and November, 2014 was below the permitted rate of 4,545 L/min (76 L/sec).

### 4.0 SUMMARY

All effluent monitoring samples were below the daily and monthly concentration limits of the ECA No. 4731-987KM8 with the exception of daily TSS on August 15, 2014 and October 1, 2014 and monthly TSS for the month of August, 2014.



## Report Signature Page

**GOLDER ASSOCIATES LTD.**



Alicia Beynon, B.Sc., G.I.T.  
Geoscientist in Training

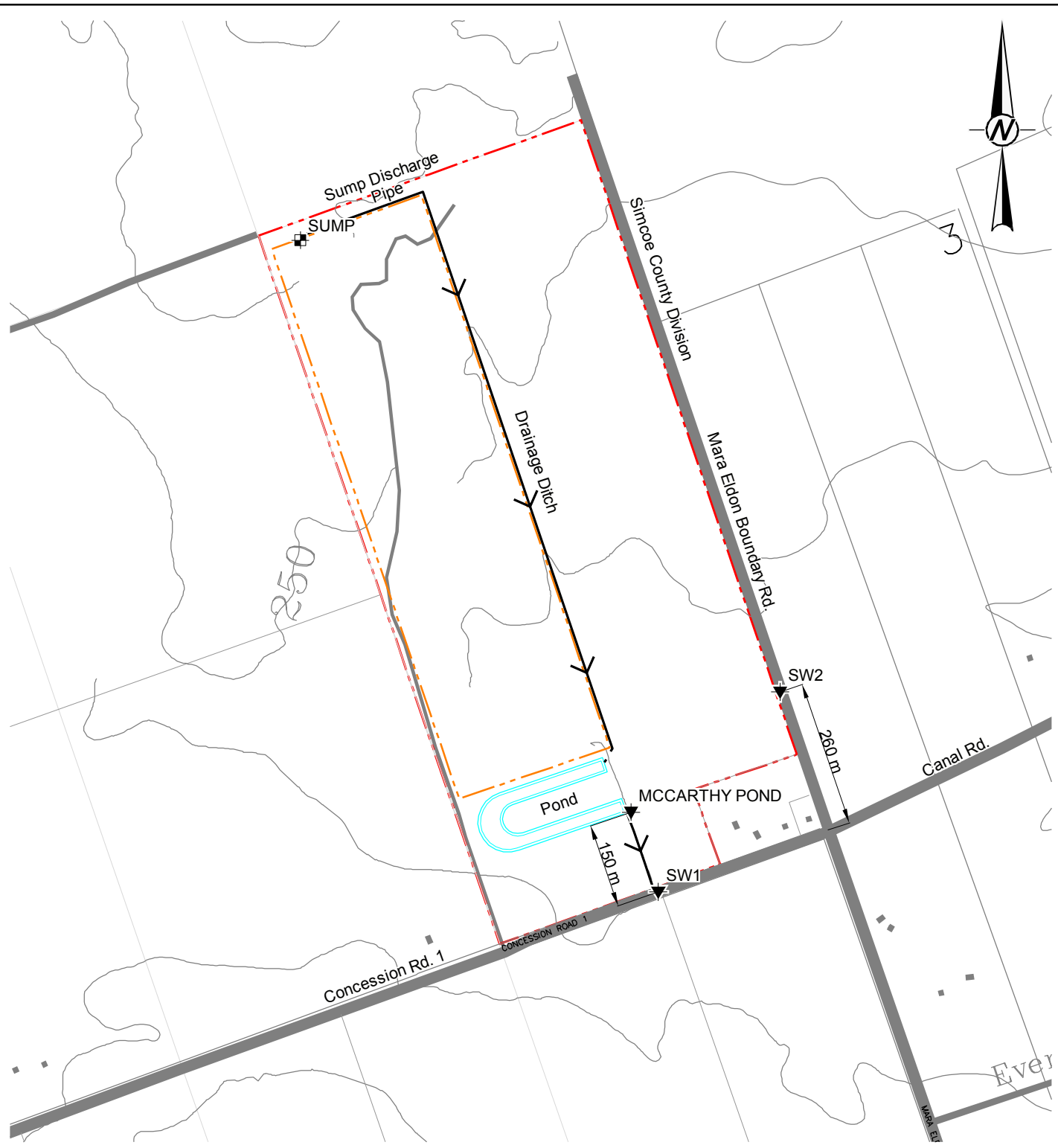
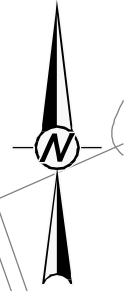
John Easton, M.Sc., P.Geol.  
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ALB/JAE/plc





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# FIGURES

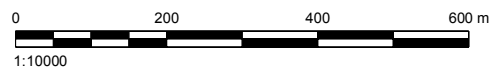


**LEGEND**

	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



CLIENT  
COCO / QBJR AGGREGATES INC.

PROJECT  
STAN MCCARTHY QUARRY

TITLE  
**LOCATION MAP**

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



PROJECT No. 14-07634	SCALE AS SHOWN	Rev. AB	Figure 1
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANS/A 25 mm



# **TABLES**

**Table 1: McCarthy Pond Weekly Water Quality Results (August to November, 2014)**

Sample ID	Unit	Reportable Detection Limit (RDL)	PWQO <sup>1</sup>	Daily Concentration Limit <sup>2</sup>	McCarthy Quarry													
					Pond													
Date					08-Aug-14	11-Aug-14	15-Aug-14	20-Aug-14	26-Aug-14	03-09-14	10-09-14	15-09-14	23-09-14	01-10-14	09-10-14	17-10-14	24-Oct-14	30-Oct-14
Conductivity	umho/cm	n/a			504		505	644	642	509	673	593	605					
pH	pH	n/a		6.0-9.5	6.95		7.59	6.43	6.51	7.73	6.92	8.58	7.52		8.16			
Temperature	°C	n/a					16.9			24.1	21.1	14.8	19.3					
Total Suspended Solids	mg/L	1		30	7	5	<b>48</b>	10	18	23	14	15	6	<b>36</b>	8	12	4	3
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	<0.5	<0.50	<0.5	1.1	<0.5	<0.5	<1.0	0.8	<0.5	<0.5	<0.5		<1.6
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0059	0.0022	0.0014		0.0022

**Notes**

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

**Table 2: Condition 7(2) McCarthy Pond Monthly Water Quality Results**

Sample ID	Unit	Reportable Detection Limit (RDL)	PWQO <sup>1</sup>	Monthly Concentration Limit <sup>2</sup>	McCarthy Quarry											
					Pond											
Date					November	December	January	March	April	May	June	July	August	September	October	
Total Suspended Solids	mg/L	1		15	11.7	2.4	3.3	4.5	<b>17.5</b>	<b>15.8</b>	3.95	6.75	<b>17.6</b>	14.5	14.9	
Total Oil and Grease	mg/L	0.5	Note 3	15	<1	<1	<1	<1	1.35	4.11	1.4	<1	1.1	0.8	0.95	
Phenols (4AAP)	mg/L	<0.0010		0.02	<0.001	<0.001	<0.001	0.0078	<0.001	1.7	<0.001	<0.001	0.0011	<0.0010	0.00256	

**Notes**

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

2. Monthly Concentration Limit; bolded values denote exceedances in the Permit to Take Waters monthly concentration limits.

3. The PWQO for Oil and Grease indicates that oil or petrochemicals should not be present in concentrations that: can be detected as a visible film, sheen or discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.

4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

**Table 3: McCarthy Semi-Annual Water Quality Monitoring Results (October, 2014)**

Sample ID	Unit	Reportable Detection Limit (RDL)	PWQO <sup>1</sup>	Interim PWQO <sup>2</sup>	PTTW Effluent Limits	McCarthy Quarry	
						Pond	SW1
Date						16-Oct-14	16-Oct-14
<b>Field Measured Parameters</b>							
Conductivity	mS/cm					679	808
pH	pH	n/a	6.5-8.5		6.0-9.5	8.74	8.46
Temperature	°C	n/a				10.2	16.2
<b>Calculated Parameters</b>							
Anion Sum	me/L	N/A				7.17	8.87
Cation Sum	me/L	N/A				7.53	8.98
Hardness (CaCO <sub>3</sub> )	mg/L	1.0				200	320
<b>Inorganics</b>							
Total Ammonia-N	mg/L	0.050				0.12	0.071
Conductivity	umho/cm	1.0				720	850
Total Dissolved Solids	mg/L	10				408	546
Fluoride (F <sup>-</sup> )	mg/L	0.10				0.53	0.37
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.83	0.85
Dissolved Organic Carbon	mg/L	0.20				6.2	5.5
pH	pH	N/A	6.5-8.5		6.0-9.5	8.11	7.95
Phenols-4AAP	mg/L	0.0010			0.04	0.0014	<0.0010
Total Phosphorus	mg/L	0.002		0.02 <sup>5b</sup>		0.023	0.012
Total Suspended Solids	mg/L	10			30	12	<10
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	1				150	220
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	1.0				100	140
Dissolved Chloride (Cl)	mg/L	1				68	40
Nitrite (N)	mg/L	0.010				0.030	0.048
Nitrate (N)	mg/L	0.10				0.65	2.49
Nitrate + Nitrite	mg/L	0.10				0.68	2.53
<b>Petroleum Hydrocarbons</b>							
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50
<b>Metals</b>							
Dissolved Aluminum (Al)	ug/L	5.0		15-75 <sup>5a</sup>		11	8.7
Dissolved Antimony (Sb)	ug/L	0.50				<0.50	<0.50
Dissolved Arsenic (As)	ug/L	1.0				<1.0	<1.0
Total Arsenic (As)	ug/L	1.0	100	5		<1.0	<1.0
Dissolved Barium (Ba)	ug/L	2.0				32	48
Dissolved Beryllium (Be)	ug/L	0.50	11-1100 <sup>5c</sup>			<0.50	<0.50
Dissolved Bismuth (Bi)	ug/L	1.0				<1.0	<1.0
Dissolved Boron (B)	ug/L	10		200		620	410
Dissolved Cadmium (Cd)	ug/L	0.10				<0.10	<0.10
Total Cadmium (Cd)	ug/L	0.10	0.2	0.1-0.5 <sup>5d</sup>		<0.10	<0.10
Dissolved Calcium (Ca)	ug/L	200				42000	95000
Total Calcium (Ca)	ug/L	200				43000	97000
Dissolved Chromium (Cr)	ug/L	5.0				<5.0	<5.0
Total Chromium (Cr)	ug/L	5.0	1-89 <sup>5e</sup>			<5.0	<5.0
Dissolved Cobalt (Co)	ug/L	0.50	0.9			<0.50	<0.50
Dissolved Copper (Cu)	ug/L	1.0				<1.0	<1.0
Total Copper (Cu)	ug/L	1.0	5	1-5 <sup>5f</sup>		<1.0	<1.0
Dissolved Iron (Fe)	ug/L	100				<100	<100
Total Iron (Fe)	ug/L	100	300			270	<100
Dissolved Lead (Pb)	ug/L	0.50				<0.50	<0.50
Total Lead (Pb)	ug/L	0.50	5-25 <sup>5g</sup>	1-5 <sup>5h</sup>		<0.50	<0.50
Dissolved Lithium (Li)	ug/L	5.0				48	33
Dissolved Magnesium (Mg)	ug/L	50				22000	21000
Total Magnesium (Mg)	ug/L	50				23000	22000
Dissolved Manganese (Mn)	ug/L	2.0				<2.0	<2.0
Total Manganese (Mn)	ug/L	2.0				13	6.6
Dissolved Molybdenum (Mo)	ug/L	0.50		40		2.2	1.4
Dissolved Nickel (Ni)	ug/L	1.0				<1.0	<1.0
Total Nickel (Ni)	ug/L	1.0	25			1.3	<1.0
Dissolved Phosphorus (P)	ug/L	100				<100	<100
Dissolved Potassium (K)	ug/L	200				9700	8900
Total Potassium (K)	ug/L	200				10000	9400
Dissolved Selenium (Se)	ug/L	2.0	100			<2.0	<2.0
Dissolved Silicon (Si)	ug/L	50				160	870
Dissolved Silver (Ag)	ug/L	0.10	0.1			<0.10	<0.10
Dissolved Sodium (Na)	ug/L	100				77000	53000
Total Sodium (Na)	ug/L	100				78000	55000
Dissolved Strontium (Sr)	ug/L	1.0				1500	1300
Dissolved Tellurium (Te)	ug/L	1.0				<1.0	<1.0
Dissolved Thallium (Tl)	ug/L	0.050		0.3		<0.050	<0.050
Dissolved Tin (Sn)	ug/L	1.0				<1.0	<1.0
Dissolved Titanium (Ti)	ug/L	5.0				<5.0	<5.0
Dissolved Tungsten (W)	ug/L	1.0		30		<1.0	<1.0
Dissolved Uranium (U)	ug/L	0.10		5		0.60	0.80
Dissolved Vanadium (V)	ug/L	0.50		6		<0.50	<0.50
Dissolved Zinc (Zn)	ug/L	5.0	30	20		<5.0	<5.0
Total Zinc (Zn)	ug/L	5.0		4		<5.0	<5.0
Dissolved Zirconium (Zr)	ug/L	1.0				<1.0	<1.0

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 PWQO 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 discoloration on the surface, can be detected by odour, can cause tainting of edible organisms, can form detectable deposits on shorelines and bottom sediments.

4. Results that are preceded by "<" denote concentrations that are below the laboratory Reportable Detection Limit (RDL).

**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 (CaCO<sub>3</sub>), use 11 ug/L  
If Hardness >75 mg/L (CaCO<sub>3</sub>), use 1100 ug/L

**5d. Cadmium (Interim):** If Hardness 0-100 mg/L (CaCO<sub>3</sub>), then use 0.1 ug/L  
If Hardness >100 mg/L (CaCO<sub>3</sub>), 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 CaCO<sub>3</sub> (mg/L) is 0 - 20, then use 1 ug/L  
If Hardness as CaCO<sub>3</sub> (mg/L) is >20, then use 5 ug/L

**5g. Lead:** If Alkalinity as CaCO<sub>3</sub> (mg/L) is < 20, use 5 ug/L  
If Alkalinity as CaCO<sub>3</sub> (mg/L) is 20 to 40, use 10 ug/L  
If Alkalinity as CaCO<sub>3</sub> (mg/L) is 40 to 80, use 20 ug/L  
If Alkalinity as CaCO<sub>3</sub> (mg/L) is > 80, use 25 ug/L

**5h. Lead (Interim):** If Hardness as CaCO<sub>3</sub> (mg/L) is < 30, then use 1 ug/L  
If Hardness as CaCO<sub>3</sub> (mg/L) is 30 to 80, then use 3 ug/L  
If Hardness as CaCO<sub>3</sub> (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			01-Aug-14	10-Sep-14	16-Oct-14
Daphnia Magna	% Mortality Rate*	<50%	0	0	0
Rainbow Trout	% Mortality Rate*	<50%	0	0	0

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

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

Date	Start	Stop	Total Min.	Total Litres	Rate of Taking L/min	Rate of Taking L/s
<b>ECA Permitted Rate</b>				<b>6,550,000.00</b>	<b>4,545.00</b>	<b>76.00</b>
01-Aug-14	8AM	10AM	120	252,000.00	2,100.00	35.00
05-Aug-14	9AM	12PM	180	378,000.00	2,100.00	35.00
06-Aug-14	9AM	12PM	180	378,000.00	2,100.00	35.00
07-Aug-14	NO PUMP		0	-	-	-
08-Aug-14	NO PUMP		0	-	-	-
11-Aug-14	7AM	12PM	300	630,000.00	2,100.00	35.00
12-Aug-14	9AM	3PM	360	75,600.00	210.00	3.50
13-Aug-14	6AM	12PM	360	756,000.00	2,100.00	35.00
14-Aug-14	NO PUMP		0	-	-	-
15-Aug-14	NO PUMP		0	-	-	-
18-Aug-14	7AM	3PM	480	1,008,000.00	2,100.00	35.00
19-Aug-14	NO PUMP		0	-	-	-
20-Aug-14	NO PUMP		0	-	-	-
21-Aug-214	7AM	2PM	420	882,000.00	2,100.00	35.00
22-Aug-14	6AM	12PM	360	756,000.00	2,100.00	35.00
25-Aug-14	9AM	12PM	180	378,000.00	2,100.00	35.00
26-Aug-14	NO PUMP		0	-	-	-
27-Aug-14	7AM	11AM	240	504,000.00	2,100.00	35.00
28-Aug-14	NO PUMP		0	-	-	-
29-Aug-14	9AM	2PM	300	630,000.00	2,100.00	35.00
02-Sep-14	9am	12pm	180	378,000.00	2,100.00	35.00
03-Sep-14	No Pump		0	-	-	-
04-Sep-14	No Pump		0	-	-	-
05-Sep-04	No Pump		0	-	-	-
08-Sep-14	8am	11am	180	378,000.00	2,100.00	35.00
09-Sep-14	No Pump		0	-	-	-
10-Sep-14	No Pump		0	-	-	-
11-Sep-14	6am	9am	180	378,000.00	2,100.00	35.00
12-Sep-14	6am	9am	180	378,000.00	2,100.00	35.00
15-Sep-14	9am	12pm	180	378,000.00	2,100.00	35.00
16-Sep-14	No Pump		0	-	-	-
17-Sep-14	No Pump		0	-	-	-
18-Sep-14	6am	9am	180	378,000.00	2,100.00	35.00
19-Sep-14	6am	9am	180	378,000.00	2,100.00	35.00
22-Sep-14	7am	3pm	480	1,008,000.00	2,100.00	35.00
23-Sep-14	No Pump		0	-	-	-
24-Sep-14	No Pump		0	-	-	-
25-Sep-14	No Pump		0	-	-	-
26-Sep-14	No Pump		0	-	-	-
29-Sep-14	7am	2pm	420	882,000.00	2,100.00	35.00
30-Sep-14	No Pump		0	-	-	-
01-Oct-14	11AM	3PM	240	504,000.00	2,100.00	35.00
02-Oct-14	7AM	12PM	300	630,000.00	2,100.00	35.00
03-Oct-14	NO PUMP		0	-	-	-
06-Oct-14	9AM	12PM	180	378,000.00	2,100.00	35.00
07-Oct-14	9AM	12PM	180	378,000.00	2,100.00	35.00
08-Oct-14	9AM	12PM	180	378,000.00	2,100.00	35.00
09-Oct-14	NO PUMP		0	-	-	-
10-Oct-14	NO PUMP		0	-	-	-
14-Oct-14	7AM	12PM	300	630,000.00	2,100.00	35.00
15-Oct-14	7AM	12PM	300	630,000.00	2,100.00	35.00
16-Oct-14	9AM	12PM	180	378,000.00	2,100.00	35.00
17-Oct-14	9AM	12PM	180	378,000.00	2,100.00	35.00
20-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
21-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
22-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
23-Oct-14	NO PUMP		0	-	-	-
24-Oct-14	NO PUMP		0	-	-	-
27-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
28-Oct-14	NO PUMP		0	-	-	-
29-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
30-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00
31-Oct-14	6AM	12PM	360	756,000.00	2,100.00	35.00



# **APPENDIX A**

## **ECA NO 4731-987KM8**



- AKossi  
- GA

Ministry of the Environment  
Ministère de l'Environnement

**AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL**

NUMBER 4731-987KM8

Issue Date: October 15, 2013

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

## TERMS AND CONDITIONS

### 1. GENERAL CONDITION

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

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

2. CHANGE OF OWNER

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

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

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

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

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

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

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

3. CHANGES IN PROCESSES OR PROCESS MATERIALS

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

4. OPERATIONS MANUAL

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

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

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

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

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

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

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

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

#### 5. EFFLUENT LIMITS

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

<b>Effluent Parameter</b>	<b>Daily Concentration Limit (mg/L)</b>	<b>Monthly Average Concentration Limit (mg/L)</b>
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:

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

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

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

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

Table 3 - Effluent and Surface Water Monitoring	
Frequency	Weekly
Sample Type	Grab
Parameters	Total Suspended Solids, Copper, Lead, Nickel, Zinc, Arsenic, Oil and Grease, Phenolics (4AAP), Hardness (as CaCO <sub>3</sub> ), Alkalinity(as CaCO <sub>3</sub> ), 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](http://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 Data**

Your Project #: 1407634  
 Site#: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 18177

**Attention: Alicia Beynon**

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

**Report Date: 2014/08/15**  
 Report #: R3122919  
 Version: 1

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4E2697**

**Received: 2014/08/09, 09:50**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/08/13	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/08/13	2014/08/13	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/08/15	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/08/13	2014/08/13	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/08/13	CAM SOP-00428	SM 22 2540D m

\* 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

**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.

Maxxam Job #: B4E2697  
 Report Date: 2014/08/15

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

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XA9829	XA9829		
Sampling Date		2014/08/08 09:30	2014/08/08 09:30		
COC Number		18177	18177		
	Units	POND	POND Lab-Dup	RDL	QC Batch
<b>Calculated Parameters</b>					
Total Animal/Vegetable Oil and Grease	mg/L	<0.50		0.50	3706439
<b>Inorganics</b>					
Phenols-4AAP	mg/L	<0.0010	<0.0010	0.0010	3712669
Total Suspended Solids	mg/L	7		1	3709624
<b>Petroleum Hydrocarbons</b>					
Total Oil & Grease	mg/L	<0.50		0.50	3708831
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50		0.50	3708832
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate					

Maxxam Job #: B4E2697  
 Report Date: 2014/08/15

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

**TEST SUMMARY**

**Maxxam ID:** XA9829  
**Sample ID:** POND  
**Matrix:** Water

**Collected:** 2014/08/08  
**Shipped:**  
**Received:** 2014/08/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3706439	N/A	2014/08/13	Automated Statchk
Total Oil and Grease	BAL	3708831	2014/08/13	2014/08/13	Francis Afonso
Phenols (4AAP)	TECH/PHEN	3712669	N/A	2014/08/15	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3708832	2014/08/13	2014/08/13	Francis Afonso
Low Level Total Suspended Solids	SLDS	3709624	N/A	2014/08/13	Bansari Ray

**Maxxam ID:** XA9829 Dup  
**Sample ID:** POND  
**Matrix:** Water

**Collected:** 2014/08/08  
**Shipped:**  
**Received:** 2014/08/09

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Phenols (4AAP)	TECH/PHEN	3712669	N/A	2014/08/15	Bramdeo Motiram

Maxxam Job #: B4E2697  
Report Date: 2014/08/15

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

### GENERAL COMMENTS

Samples received with temp >10 C and analysis conducted with client's consent.

**Results relate only to the items tested.**

Maxxam Job #: B4E2697  
 Report Date: 2014/08/15

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

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3708831	FA	Spiked Blank	Total Oil & Grease	2014/08/13		99	%	85 - 115
3708831	FA	RPD	Total Oil & Grease	2014/08/13	3.9		%	25
3708831	FA	Method Blank	Total Oil & Grease	2014/08/13	<0.50		mg/L	
3708832	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2014/08/13		92	%	85 - 115
3708832	FA	RPD	Total Oil & Grease Mineral/Synthetic	2014/08/13	1.6		%	25
3708832	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2014/08/13	<0.50		mg/L	
3709624	RAY	QC Standard	Total Suspended Solids	2014/08/13		98	%	85 - 115
3709624	RAY	Method Blank	Total Suspended Solids	2014/08/13	<1		mg/L	
3712669	BMO	Matrix Spike [XA9829-04]	Phenols-4AAP	2014/08/15		97	%	80 - 120
3712669	BMO	Spiked Blank	Phenols-4AAP	2014/08/15		98	%	85 - 115
3712669	BMO	Method Blank	Phenols-4AAP	2014/08/15	<0.0010		mg/L	
3712669	BMO	RPD [XA9829-04]	Phenols-4AAP	2014/08/15	NC		%	20

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 (one or both samples < 5x RDL).

Maxxam Job #: B4E2697  
Report Date: 2014/08/15

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

### VALIDATION SIGNATURE PAGE

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

A handwritten signature in black ink that reads "Cristina Carriere".

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Cristina Carriere, Scientific Services

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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.

Your Project #: 1407634  
 Site#: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 48173301, 481733-01-01

**Attention: Alicia Beynon**  
 Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2014/08/22**  
**Report #: R3131287**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4E8132**  
**Received: 2014/08/16, 09:25**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/08/20	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/08/19	2014/08/20	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/08/22	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/08/19	2014/08/20	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/08/19	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

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- \* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
- \* Results relate only to the items tested.

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

Maxxam Job #: B4E8132  
Report Date: 2014/08/22

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

-2-

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.

Total cover pages: 2

Maxxam Job #: B4E8132  
 Report Date: 2014/08/22

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

### RESULTS OF ANALYSES OF WATER

Maxxam ID		XD7107		
Sampling Date		2014/08/15 10:00		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3714711
<b>Inorganics</b>				
Phenols-4AAP	mg/L	0.0011	0.0010	3718493
Total Suspended Solids	mg/L	48	1	3715992
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3717036
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3717065

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch

Maxxam Job #: B4E8132  
 Report Date: 2014/08/22

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

### Test Summary

**Maxxam ID** XD7107  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/08/15  
**Shipped**  
**Received** 2014/08/16

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3714711	N/A	2014/08/20	Automated Statchk
Total Oil and Grease	BAL	3717036	2014/08/19	2014/08/20	Amjad Mir
Phenols (4AAP)	TECH/PHEN	3718493	N/A	2014/08/22	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3717065	2014/08/19	2014/08/20	Amjad Mir
Low Level Total Suspended Solids	SLDS	3715992	N/A	2014/08/19	Bansari Ray

Maxxam Job #: B4E8132  
Report Date: 2014/08/22

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

**GENERAL COMMENTS**

Samples received with temp>10 C and analysis conducted with client's consent.

Maxxam Job #: B4E8132  
 Report Date: 2014/08/22

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

### QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3715992	Total Suspended Solids	2014/08/19					<1	mg/L	NC	25	98	85 - 115
3717036	Total Oil & Grease	2014/08/20			96	85 - 115	<0.50	mg/L	1.8	25		
3717065	Total Oil & Grease Mineral/Synthetic	2014/08/20			94	85 - 115	<0.50	mg/L	0.5	25		
3718493	Phenols-4AAP	2014/08/22	98	80 - 120	100	85 - 115	<0.0010	mg/L	NC	20		

N/A = Not Applicable

RPD = Relative Percent Difference

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.

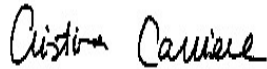
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

## Validation Signature Page

**Maxxam Job #: B4E8132**

---

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

A handwritten signature in black ink that reads "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.

Your Project #: 1407634  
Site#: 1407634  
Site Location: MCCARTHY  
Your C.O.C. #: 48196601, 481966-01-01

**Attention: Alicia Beynon**  
Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2014/08/28**  
**Report #: R3138337**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4F3483**  
**Received: 2014/08/22, 09:50**

Sample Matrix: Water  
# Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Animal and Vegetable Oil & Grease	1	N/A	2014/08/28	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/08/28	2014/08/28	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/08/25	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/08/28	2014/08/28	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/08/26	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

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

\* Results relate only to the items tested.

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

Maxxam Job #: B4F3483  
Report Date: 2014/08/28

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

-2-

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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Total cover pages: 2

Maxxam Job #: B4F3483  
Report Date: 2014/08/28

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

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XG3437	XG3437		
Sampling Date		2014/08/20 12:00	2014/08/20 12:00		
	<b>Units</b>	<b>POND</b>	<b>POND Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>					
Total Animal/Vegetable Oil and Grease	mg/L	<0.50		0.50	3721269
<b>Inorganics</b>					
Phenols-4AAP	mg/L	<0.0010		0.0010	3723141
Total Suspended Solids	mg/L	10	11	1	3723377
<b>Petroleum Hydrocarbons</b>					
Total Oil & Grease	mg/L	<0.50		0.50	3728019
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50		0.50	3728025

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4F3483  
Report Date: 2014/08/28

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

**Test Summary**

**Maxxam ID** XG3437  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/08/20  
**Shipped**  
**Received** 2014/08/22

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3721269	N/A	2014/08/28	Automated Statchk
Total Oil and Grease	BAL	3728019	2014/08/28	2014/08/28	Amjad Mir
Phenols (4AAP)	TECH/PHEN	3723141	N/A	2014/08/25	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3728025	2014/08/28	2014/08/28	Amjad Mir
Low Level Total Suspended Solids	SLDS	3723377	N/A	2014/08/26	Deepak Sharma

**Maxxam ID** XG3437 Dup  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/08/20  
**Shipped**  
**Received** 2014/08/22

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Low Level Total Suspended Solids	SLDS	3723377	N/A	2014/08/26	Deepak Sharma

Maxxam Job #: B4F3483  
Report Date: 2014/08/28

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

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3723141	Phenols-4AAP	2014/08/25	99	80 - 120	101	85 - 115	<0.0010	mg/L	NC	20		
3723377	Total Suspended Solids	2014/08/26					<1	mg/L	6.2	25	97	85 - 115
3728019	Total Oil & Grease	2014/08/28			98	85 - 115	<0.50	mg/L	1.3	25		
3728025	Total Oil & Grease Mineral/Synthetic	2014/08/28			96	85 - 115	<0.50	mg/L	1.0	25		

N/A = Not Applicable

RPD = Relative Percent Difference

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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.

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 (one or both samples < 5x RDL).

**Validation Signature Page**

**Maxxam Job #: B4F3483**

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



\_\_\_\_\_  
Cristina Carriere, Scientific Services

=====  
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Your Project #: 1407634  
 Site#: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 48196602, 481966-02-01

**Attention: Alicia Beynon**  
 Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2014/09/03**  
**Report #: R3143344**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4F7774**  
**Received: 2014/08/28, 09:47**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/09/02	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/09/02	2014/09/02	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/09/02	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/09/02	2014/09/02	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/09/02	CAM SOP-00428	SM 22 2540D m

### Remarks:

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- \* Results relate only to the items tested.

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

Maxxam Job #: B4F7774  
Report Date: 2014/09/03

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

-2-

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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Total cover pages: 2

Maxxam Job #: B4F7774  
Report Date: 2014/09/03

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

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XI5428		
Sampling Date		2014/08/26 15:00		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	1.1	0.50	3728119
<b>Inorganics</b>				
Phenols-4AAP	mg/L	<0.0010	0.0010	3731717
Total Suspended Solids	mg/L	18	1	3732593
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	1.1	0.50	3732191
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3732192

---

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4F7774  
Report Date: 2014/09/03

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

### Test Summary

**Maxxam ID** XI5428  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/08/26  
**Shipped**  
**Received** 2014/08/28

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3728119	N/A	2014/09/02	Automated Statchk
Total Oil and Grease	BAL	3732191	2014/09/02	2014/09/02	Francis Afonso
Phenols (4AAP)	TECH/PHEN	3731717	N/A	2014/09/02	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3732192	2014/09/02	2014/09/02	Francis Afonso
Low Level Total Suspended Solids	SLDS	3732593	N/A	2014/09/02	Niki Shah

Maxxam Job #: B4F7774  
Report Date: 2014/09/03

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

**GENERAL COMMENTS**

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

Maxxam Job #: B4F7774  
Report Date: 2014/09/03

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

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3731717	Phenols-4AAP	2014/09/02	92	80 - 120	101	85 - 115	<0.0010	mg/L	NC	20		
3732191	Total Oil & Grease	2014/09/02	93	75 - 125	99	85 - 115	<0.50	mg/L	1.5	25		
3732192	Total Oil & Grease Mineral/Synthetic	2014/09/02	91	75 - 125	95	85 - 115	<0.50	mg/L	2.7	25		
3732593	Total Suspended Solids	2014/09/02					<1	mg/L	15.9	25	98	85 - 115

N/A = Not Applicable

RPD = Relative Percent Difference

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

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

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

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

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**Validation Signature Page**

**Maxxam Job #: B4F7774**

---

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.

Your Project #: 1407634  
 Site#: 1407634  
 Site Location: MCCARTHY  
 Your C.O.C. #: 48196603, 481966-03-01

**Attention: Alicia Beynon**  
 Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2014/09/09**  
**Report #: R3149527**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4G1591**  
**Received: 2014/09/04, 09:35**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/09/05	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/09/05	2014/09/05	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/09/07	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/09/05	2014/09/05	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/09/05	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

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- \* Results relate only to the items tested.

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

Maxxam Job #: B4G1591  
Report Date: 2014/09/09

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

-2-

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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Total cover pages: 2

Maxxam Job #: B4G1591  
Report Date: 2014/09/09

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

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XK5241		
Sampling Date		2014/09/03 12:30		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3735741
<b>Inorganics</b>				
Phenols-4AAP	mg/L	<0.0010	0.0010	3738533
Total Suspended Solids	mg/L	23	1	3737583
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3738037
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3738044

---

RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4G1591  
Report Date: 2014/09/09

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

**Test Summary**

**Maxxam ID** XK5241  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/09/03  
**Shipped**  
**Received** 2014/09/04

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3735741	N/A	2014/09/05	Automated Statchk
Total Oil and Grease	BAL	3738037	2014/09/05	2014/09/05	Amjad Mir
Phenols (4AAP)	TECH/PHEN	3738533	N/A	2014/09/07	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3738044	2014/09/05	2014/09/05	Amjad Mir
Low Level Total Suspended Solids	SLDS	3737583	N/A	2014/09/05	Niki Shah

Maxxam Job #: B4G1591  
Report Date: 2014/09/09

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

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3737583	Total Suspended Solids	2014/09/05					<1	mg/L	4.3	25	97	85 - 115
3738037	Total Oil & Grease	2014/09/05			98	85 - 115	<0.50	mg/L	3.4	25		
3738044	Total Oil & Grease Mineral/Synthetic	2014/09/05			96	85 - 115	<0.50	mg/L	3.7	25		
3738533	Phenols-4AAP	2014/09/07	NC	80 - 120	99	85 - 115	<0.0010	mg/L	NC	20		

N/A = Not Applicable

RPD = Relative Percent Difference

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

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 spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of 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 (one or both samples < 5x RDL).

**Validation Signature Page**

**Maxxam Job #: B4G1591**

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



\_\_\_\_\_  
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.

Your Project #: 1407634  
Site#: 1407634  
Your C.O.C. #: 48196606, 481966-06-01

**Attention: Alicia Beynon**  
Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2014/09/17**  
**Report #: R3159163**  
**Version: 1**

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4G8192**  
**Received: 2014/09/12, 10:45**

Sample Matrix: Water  
# Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Animal and Vegetable Oil & Grease	1	N/A	2014/09/16	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/09/16	2014/09/16	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/09/16	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/09/16	2014/09/16	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/09/15	CAM SOP-00428	SM 22 2540D m

**Remarks:**

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

- \* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
- \* Results relate only to the items tested.

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

Maxxam Job #: B4G8192  
Report Date: 2014/09/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

-2-

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.

Total cover pages: 2

Maxxam Job #: B4G8192  
Report Date: 2014/09/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XN6527		
Sampling Date		2014/09/10 13:30		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3745745
<b>Inorganics</b>				
Phenols-4AAP	mg/L	<0.0010	0.0010	3748050
Total Suspended Solids	mg/L	14	1	3747884
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3749910
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3749967

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RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4G8192  
Report Date: 2014/09/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

### Test Summary

**Maxxam ID** XN6527  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/09/10  
**Shipped**  
**Received** 2014/09/12

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3745745	N/A	2014/09/16	Automated Statchk
Total Oil and Grease	BAL	3749910	2014/09/16	2014/09/16	Amjad Mir
Phenols (4AAP)	TECH/PHEN	3748050	N/A	2014/09/16	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3749967	2014/09/16	2014/09/16	Amjad Mir
Low Level Total Suspended Solids	SLDS	3747884	N/A	2014/09/15	Deepak Sharma

Maxxam Job #: B4G8192  
Report Date: 2014/09/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3747884	Total Suspended Solids	2014/09/15					<1	mg/L	3.0	25	97	85 - 115
3748050	Phenols-4AAP	2014/09/16	NC	80 - 120	99	85 - 115	<0.0010	mg/L	11.2	20		
3749910	Total Oil & Grease	2014/09/16			101	85 - 115	<0.50	mg/L	5.9	25		
3749967	Total Oil & Grease Mineral/Synthetic	2014/09/16			97	85 - 115	<0.50	mg/L	7.0	25		

N/A = Not Applicable

RPD = Relative Percent Difference

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

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 spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

**Validation Signature Page**

**Maxxam Job #: B4G8192**

---

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.

Your Project #: 1407637  
Site#: 1407637  
Site Location: MCCARTHY  
Your C.O.C. #: 18182

**Attention: Alicia Beynon**  
Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2014/09/22**  
**Report #: R3164528**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4H1830**  
**Received: 2014/09/17, 10:40**

Sample Matrix: Water  
# Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Method Reference
Animal and Vegetable Oil & Grease	1	N/A	2014/09/19	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/09/18	2014/09/19	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/09/19	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/09/18	2014/09/19	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/09/19	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

- \* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
- \* Results relate only to the items tested.

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

Maxxam Job #: B4H1830  
Report Date: 2014/09/22

Golder Associates Ltd  
Client Project #: 1407637  
Site Location: MCCARTHY  
Sampler Initials: AB

-2-

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.

Total cover pages: 2

Maxxam Job #: B4H1830  
Report Date: 2014/09/22

Golder Associates Ltd  
Client Project #: 1407637  
Site Location: MCCARTHY  
Sampler Initials: AB

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XP3759		
Sampling Date		2014/09/15 18:40		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<1.0	1.0	3752084
<b>Inorganics</b>				
Phenols-4AAP	mg/L	<0.0010	0.0010	3754442
Total Suspended Solids	mg/L	15	1	3749404
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<1.0	1.0	3753599
Total Oil & Grease Mineral/Synthetic	mg/L	<1.0	1.0	3753628

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RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4H1830  
Report Date: 2014/09/22

Golder Associates Ltd  
Client Project #: 1407637  
Site Location: MCCARTHY  
Sampler Initials: AB

**Test Summary**

**Maxxam ID** XP3759  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/09/15  
**Shipped**  
**Received** 2014/09/17

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3752084	N/A	2014/09/19	Automated Statchk
Total Oil and Grease	BAL	3753599	2014/09/18	2014/09/19	Amjad Mir
Phenols (4AAP)	TECH/PHEN	3754442	N/A	2014/09/19	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3753628	2014/09/18	2014/09/19	Amjad Mir
Low Level Total Suspended Solids	SLDS	3749404	N/A	2014/09/19	Deepak Sharma

Maxxam Job #: B4H1830  
Report Date: 2014/09/22

Golder Associates Ltd  
Client Project #: 1407637  
Site Location: MCCARTHY  
Sampler Initials: AB

**GENERAL COMMENTS**

O&G &TPH Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

Maxxam Job #: B4H1830  
Report Date: 2014/09/22

Golder Associates Ltd  
Client Project #: 1407637  
Site Location: MCCARTHY  
Sampler Initials: AB

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3749404	Total Suspended Solids	2014/09/19					<1	mg/L	7.1	25	98	85 - 115
3753599	Total Oil & Grease	2014/09/19			97	85 - 115	<0.50	mg/L	4.3	25		
3753628	Total Oil & Grease Mineral/Synthetic	2014/09/19			93	85 - 115	<0.50	mg/L	2.1	25		
3754442	Phenols-4AAP	2014/09/19	99	80 - 120	99	85 - 115	<0.0010	mg/L	NC	20		

N/A = Not Applicable

RPD = Relative Percent Difference

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 (one or both samples < 5x RDL).

**Validation Signature Page**

**Maxxam Job #: B4H1830**

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



\_\_\_\_\_  
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.

Your Project #: 1407634  
Site#: 1407634  
Your C.O.C. #: 481966-05-01

**Attention: Alicia Beynon**  
Golder Associates Ltd  
121 Commerce Park Drive  
Unit L  
Barrie, ON  
L4N 8X1

**Report Date: 2014/09/26**  
**Report #: R3170274**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4H7270**  
**Received: 2014/09/24, 14:30**

Sample Matrix: Water  
# Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/09/25	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/09/25	2014/09/25	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/09/26	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/09/25	2014/09/25	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/09/25	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

- \* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
- \* Results relate only to the items tested.

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

Maxxam Job #: B4H7270  
Report Date: 2014/09/26

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

-2-

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.

Total cover pages: 2

Maxxam Job #: B4H7270  
Report Date: 2014/09/26

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XS0991		
Sampling Date		2014/09/23 16:00		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	0.80	0.50	3760281
<b>Inorganics</b>				
Phenols-4AAP	mg/L	<0.0010	0.0010	3762272
Total Suspended Solids	mg/L	6	1	3761580
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	0.80	0.50	3762369
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3762375

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RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4H7270  
Report Date: 2014/09/26

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

### Test Summary

**Maxxam ID** XS0991  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/09/23  
**Shipped**  
**Received** 2014/09/24

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3760281	N/A	2014/09/25	Automated Statchk
Total Oil and Grease	BAL	3762369	2014/09/25	2014/09/25	Francis Afonso
Phenols (4AAP)	TECH/PHEN	3762272	N/A	2014/09/26	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3762375	2014/09/25	2014/09/25	Francis Afonso
Low Level Total Suspended Solids	SLDS	3761580	N/A	2014/09/25	Deepak Sharma

Maxxam Job #: B4H7270  
Report Date: 2014/09/26

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: AB

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3761580	Total Suspended Solids	2014/09/25					<1	mg/L	NC	25	98	85 - 115
3762272	Phenols-4AAP	2014/09/26	NC	80 - 120	102	85 - 115	<0.0010	mg/L	NC	20		
3762369	Total Oil & Grease	2014/09/25			97	85 - 115	<0.50	mg/L	2.6	25		
3762375	Total Oil & Grease Mineral/Synthetic	2014/09/25			97	85 - 115	<0.50	mg/L	3.2	25		

N/A = Not Applicable

RPD = Relative Percent Difference

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

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

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of 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 (one or both samples < 5x RDL).

**Validation Signature Page**

**Maxxam Job #: B4H7270**

---

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.

Your Project #: 1407634  
 Site#: 1407634  
 Your C.O.C. #: 485991-01-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/10/07**  
 Report #: R3181585  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4I3910**

**Received: 2014/10/02, 10:10**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/10/07	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/10/07	2014/10/07	CAM SOP-00326	EPA 1664B m
pH	1	N/A	2014/10/04	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	1	N/A	2014/10/06	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/10/07	2014/10/07	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/10/03	CAM SOP-00428	SM 22 2540D m

\* 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

**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.

Maxxam Job #: B4I3910  
Report Date: 2014/10/07

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		XV6517		
<b>Sampling Date</b>		2014/10/01 13:30		
<b>COC Number</b>		485991-01-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3770637
<b>Inorganics</b>				
pH	pH	8.04	N/A	3772386
Phenols-4AAP	mg/L	0.0059	0.0020	3773717
Total Suspended Solids	mg/L	36	2	3772983
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3775822
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3776122
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

Maxxam Job #: B4I3910  
Report Date: 2014/10/07

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

**TEST SUMMARY**

**Maxxam ID:** XV6517  
**Sample ID:** POND  
**Matrix:** Water

**Collected:** 2014/10/01  
**Shipped:**  
**Received:** 2014/10/02

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3770637	N/A	2014/10/07	Automated Statchk
Total Oil and Grease	BAL	3775822	2014/10/07	2014/10/07	Amjad Mir
pH	PH	3772386	N/A	2014/10/04	Neil Dassanayake
Phenols (4AAP)	TECH/PHEN	3773717	N/A	2014/10/06	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3776122	2014/10/07	2014/10/07	Amjad Mir
Low Level Total Suspended Solids	SLDS	3772983	N/A	2014/10/03	Bansari Ray

Maxxam Job #: B4I3910  
Report Date: 2014/10/07

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

**GENERAL COMMENTS**

**Results relate only to the items tested.**

Maxxam Job #: B4I3910  
Report Date: 2014/10/07

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3772386	NYS	Spiked Blank	pH	2014/10/04		102	%	98 - 103
3772386	NYS	RPD	pH	2014/10/04	0.27		%	N/A
3772983	RAY	QC Standard	Total Suspended Solids	2014/10/03		97	%	85 - 115
3772983	RAY	Method Blank	Total Suspended Solids	2014/10/03	<1		mg/L	
3772983	RAY	RPD	Total Suspended Solids	2014/10/03	NC		%	25
3773717	BMO	Matrix Spike	Phenols-4AAP	2014/10/06		99	%	80 - 120
3773717	BMO	Spiked Blank	Phenols-4AAP	2014/10/06		100	%	85 - 115
3773717	BMO	Method Blank	Phenols-4AAP	2014/10/06	<0.0010		mg/L	
3773717	BMO	RPD	Phenols-4AAP	2014/10/06	NC		%	20
3775822	AMJ	Matrix Spike	Total Oil & Grease	2014/10/07		103	%	75 - 125
3775822	AMJ	Spiked Blank	Total Oil & Grease	2014/10/07		97	%	85 - 115
3775822	AMJ	RPD	Total Oil & Grease	2014/10/07	0.78		%	25
3775822	AMJ	Method Blank	Total Oil & Grease	2014/10/07	<0.50		mg/L	
3776122	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2014/10/07		94	%	85 - 115
3776122	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2014/10/07	0.53		%	25
3776122	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2014/10/07	<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 (one or both samples < 5x RDL).

Maxxam Job #: B4I3910  
Report Date: 2014/10/07

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### 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

---

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

Your Project #: 1407634  
 Site#: 1407634  
 Your C.O.C. #: 485991-06-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/10/17**  
 Report #: R3192245  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4J0195**

**Received: 2014/10/10, 10:05**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/10/16	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/10/15	2014/10/16	CAM SOP-00326	EPA 1664B m
pH	1	N/A	2014/10/16	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	1	N/A	2014/10/16	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/10/15	2014/10/16	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/10/15	CAM SOP-00428	SM 22 2540D m

\* 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

**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 #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		XY7714		
<b>Sampling Date</b>		2014/10/09 11:30		
<b>COC Number</b>		485991-06-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3783459
<b>Inorganics</b>				
pH	pH	8.16	N/A	3786382
Phenols-4AAP	mg/L	0.0022	0.0010	3786294
Total Suspended Solids	mg/L	8	1	3785065
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3785837
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3785845
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable				

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### TEST SUMMARY

**Maxxam ID:** XY7714  
**Sample ID:** POND  
**Matrix:** Water

**Collected:** 2014/10/09  
**Shipped:**  
**Received:** 2014/10/10

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3783459	N/A	2014/10/16	Automated Statchk
Total Oil and Grease	BAL	3785837	2014/10/15	2014/10/16	Amjad Mir
pH	PH	3786382	N/A	2014/10/16	Surinder Rai
Phenols (4AAP)	TECH/PHEN	3786294	N/A	2014/10/16	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3785845	2014/10/15	2014/10/16	Amjad Mir
Low Level Total Suspended Solids	SLDS	3785065	N/A	2014/10/15	Bansari Ray

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3785065	RAY	QC Standard	Total Suspended Solids	2014/10/15		97	%	85 - 115
3785065	RAY	Method Blank	Total Suspended Solids	2014/10/15	<1		mg/L	
3785065	RAY	RPD	Total Suspended Solids	2014/10/15	NC		%	25
3785837	AMJ	Spiked Blank	Total Oil & Grease	2014/10/16		96	%	85 - 115
3785837	AMJ	RPD	Total Oil & Grease	2014/10/16	1.0		%	25
3785837	AMJ	Method Blank	Total Oil & Grease	2014/10/16	<0.50		mg/L	
3785845	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2014/10/16		93	%	85 - 115
3785845	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2014/10/16	1.6		%	25
3785845	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2014/10/16	<0.50		mg/L	
3786294	BMO	Matrix Spike	Phenols-4AAP	2014/10/16		101	%	80 - 120
3786294	BMO	Spiked Blank	Phenols-4AAP	2014/10/16		101	%	85 - 115
3786294	BMO	Method Blank	Phenols-4AAP	2014/10/16	<0.0010		mg/L	
3786294	BMO	RPD	Phenols-4AAP	2014/10/16	NC		%	20
3786382	SAU	Spiked Blank	pH	2014/10/16		102	%	98 - 103
3786382	SAU	RPD	pH	2014/10/16	0.22		%	N/A

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 (one or both samples < 5x RDL).

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: SG

### VALIDATION SIGNATURE PAGE

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

*Cristina Carriere*

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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.

Your Project #: 1407634  
 Site#: 1407634  
 Your C.O.C. #: 485991-06-01

**Attention: Alicia Beynon**  
 Golder Associates Ltd  
 121 Commerce Park Drive  
 Unit L  
 Barrie, ON  
 L4N 8X1

**Report Date: 2014/10/17**  
**Report #: R3192245**  
**Version: 1**

## CERTIFICATE OF ANALYSIS

**MAXXAM JOB #: B4J0195**  
**Received: 2014/10/10, 10:05**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Method Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/10/16	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/10/15	2014/10/16	CAM SOP-00326	EPA 1664B m
pH	1	N/A	2014/10/16	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	1	N/A	2014/10/16	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/10/15	2014/10/16	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/10/15	CAM SOP-00428	SM 22 2540D m

### Remarks:

Maxxam Analytics has performed all analytical testing herein in accordance with ISO 17025 and the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act. All methodologies comply with this document and are validated for use in the laboratory. The methods and techniques employed in this analysis conform to the performance criteria (detection limits, accuracy and precision) as outlined in the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act.

The CWS PHC methods employed by Maxxam conform to all prescribed elements of the reference method and performance based elements have been validated. All modifications have been validated and proven equivalent following the 'Alberta Environment Draft Addenda to the CWS-PHC, Appendix 6, Validation of Alternate Methods'. Documentation is available upon request. Maxxam has made the following improvements to the CWS-PHC reference benchmark method: (i) Headspace for F1; and, (ii) Mechanical extraction for F2-F4. Note: F4G cannot be added to the C6 to C50 hydrocarbons. The extraction date for samples field preserved with methanol for F1 and Volatile Organic Compounds is considered to be the date sampled.

Maxxam Analytics is accredited for all specific parameters as required by Ontario Regulation 153/04. Maxxam Analytics is limited in liability to the actual cost of analysis unless otherwise agreed in writing. There is no other warranty expressed or implied. Samples will be retained at Maxxam Analytics for three weeks from receipt of data or as per contract.

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

\* Results relate only to the items tested.

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

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: SG

-2-

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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Total cover pages: 2

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: SG

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		XY7714		
Sampling Date		2014/10/09 11:30		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	3783459
<b>Inorganics</b>				
pH	pH	8.16		3786382
Phenols-4AAP	mg/L	0.0022	0.0010	3786294
Total Suspended Solids	mg/L	8	1	3785065
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<0.50	0.50	3785837
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	3785845

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RDL = Reportable Detection Limit  
QC Batch = Quality Control Batch

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: SG

### Test Summary

**Maxxam ID** XY7714  
**Sample ID** POND  
**Matrix** Water

**Collected** 2014/10/09  
**Shipped**  
**Received** 2014/10/10

Test Description	Instrumentation	Batch	Extracted	Analyzed	Analyst
Animal and Vegetable Oil & Grease	BAL	3783459	N/A	2014/10/16	Automated Statchk
Total Oil and Grease	BAL	3785837	2014/10/15	2014/10/16	Amjad Mir
pH	PH	3786382	N/A	2014/10/16	Surinder Rai
Phenols (4AAP)	TECH/PHEN	3786294	N/A	2014/10/16	Bramdeo Motiram
TPH (Heavy Oil)	BAL	3785845	2014/10/15	2014/10/16	Amjad Mir
Low Level Total Suspended Solids	SLDS	3785065	N/A	2014/10/15	Bansari Ray

Maxxam Job #: B4J0195  
Report Date: 2014/10/17

Golder Associates Ltd  
Client Project #: 1407634

Sampler Initials: SG

**QUALITY ASSURANCE REPORT**

QC Batch	Parameter	Date	Matrix Spike		Spiked Blank		Method Blank		RPD		QC Standard	
			% Recovery	QC Limits	% Recovery	QC Limits	Value	Units	Value (%)	QC Limits	% Recovery	QC Limits
3785065	Total Suspended Solids	2014/10/15					<1	mg/L	NC	25	97	85 - 115
3785837	Total Oil & Grease	2014/10/16			96	85 - 115	<0.50	mg/L	1.0	25		
3785845	Total Oil & Grease Mineral/Synthetic	2014/10/16			93	85 - 115	<0.50	mg/L	1.6	25		
3786294	Phenols-4AAP	2014/10/16	101	80 - 120	101	85 - 115	<0.0010	mg/L	NC	20		
3786382	pH	2014/10/16			102	98 - 103			0.2	N/A		

N/A = Not Applicable

RPD = Relative Percent Difference

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 (one or both samples < 5x RDL).

**Validation Signature Page**

**Maxxam Job #: B4J0195**

---

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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Your Project #: 1407634  
 Site#: 1407634  
 Site Location: MCCARTHY QUARRY  
 Your C.O.C. #: 489245-01-01

**Attention: Alicia Beynon**

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

**Report Date: 2014/10/27**  
 Report #: R3202237  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4J4786**

**Received: 2014/10/18, 10:25**

Sample Matrix: Water  
 # Samples Received: 2

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Alkalinity	2	N/A	2014/10/21	CAM SOP-00448	SM 22 2320 B m
Chloride by Automated Colourimetry	2	N/A	2014/10/24	CAM SOP-00463	EPA 325.2 m
Conductivity	2	N/A	2014/10/21	CAM SOP-00414	SM 22 2510 m
Dissolved Organic Carbon (DOC) (1)	2	N/A	2014/10/22	CAM SOP-00446	SM 22 5310 B m
Fluoride	2	2014/10/21	2014/10/21	CAM SOP-00449	SM 22 4500-F C m
Hardness (calculated as CaCO3)	2	N/A	2014/10/22	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals by ICPMS	2	2014/10/22	2014/10/22	CAM SOP-00447	EPA 6020 m
Total Metals Analysis by ICPMS	2	N/A	2014/10/24	CAM SOP-00447	EPA 6020 m
Anion and Cation Sum	2	N/A	2014/10/22		
Total Ammonia-N	2	N/A	2014/10/22	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	2	N/A	2014/10/23	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Total Oil and Grease	2	2014/10/23	2014/10/24	CAM SOP-00326	EPA 1664B m
pH	2	N/A	2014/10/21	CAM SOP-00413	SM 4500H+ B
Phenols (4AAP)	2	N/A	2014/10/21	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	2	N/A	2014/10/24	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	2	N/A	2014/10/21	CAM SOP-00428	SM 22 2540C m
Total Kjeldahl Nitrogen in Water	2	2014/10/26	2014/10/27	CAM SOP-00454	EPA 351.2 m
Total Phosphorus (Colourimetric)	2	2014/10/23	2014/10/24	CAM SOP-00407	SM 4500 P B F m
Total Suspended Solids	2	N/A	2014/10/21	CAM SOP-00428	SM 22 2540D m

\* 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.

Your Project #: 1407634  
Site#: 1407634  
Site Location: MCCARTHY QUARRY  
Your C.O.C. #: 489245-01-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/10/27**  
Report #: R3202237  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4J4786**  
**Received: 2014/10/18, 10:25**

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 #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**RESULTS OF ANALYSES OF WATER**

Maxxam ID		YB2414	YB2414	YB2415	YB2415		
Sampling Date		2014/10/16 16:00	2014/10/16 16:00	2014/10/16 16:20	2014/10/16 16:20		
COC Number		489245-01-01	489245-01-01	489245-01-01	489245-01-01		
	<b>Units</b>	<b>SW1</b>	<b>SW1 Lab-Dup</b>	<b>SW3</b>	<b>SW3 Lab-Dup</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>							
Anion Sum	me/L	8.87		7.17		N/A	3790087
Cation Sum	me/L	8.98		7.53		N/A	3790087
Hardness (CaCO3)	mg/L	320		200		1.0	3790306
<b>Inorganics</b>							
Total Ammonia-N	mg/L	0.071		0.12		0.050	3792773
Conductivity	umho/cm	850		720		1.0	3792963
Total Dissolved Solids	mg/L	546		408		10	3792005
Fluoride (F-)	mg/L	0.37		0.53		0.10	3792964
Total Kjeldahl Nitrogen (TKN)	mg/L	0.85	0.86	0.83		0.10	3799611
Dissolved Organic Carbon	mg/L	5.5		6.2		0.20	3792438
pH	pH	7.95		8.11		N/A	3792962
Phenols-4AAP	mg/L	<0.0010	<0.0010	0.0014		0.0010	3792440
Total Phosphorus	mg/L	0.012		0.023	0.023	0.002	3796056
Total Suspended Solids	mg/L	<10		12		10	3792004
Dissolved Sulphate (SO4)	mg/L	220	220	150		1	3795563
Alkalinity (Total as CaCO3)	mg/L	140		100		1.0	3792953
Dissolved Chloride (Cl)	mg/L	40	41	68		1	3795562
Nitrite (N)	mg/L	0.048		0.030		0.010	3793018
Nitrate (N)	mg/L	2.49		0.65		0.10	3793018
Nitrate + Nitrite	mg/L	2.53		0.68		0.10	3793018
<b>Petroleum Hydrocarbons</b>							
Total Oil & Grease	mg/L	<0.50		<0.50		0.50	3796958
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate							

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID		YB2414	YB2414	YB2415		
Sampling Date		2014/10/16 16:00	2014/10/16 16:00	2014/10/16 16:20		
COC Number		489245-01-01	489245-01-01	489245-01-01		
	Units	SW1	SW1 Lab-Dup	SW3	RDL	QC Batch
<b>Metals</b>						
Dissolved Aluminum (Al)	ug/L	8.7		11	5.0	3794064
Dissolved Antimony (Sb)	ug/L	<0.50		<0.50	0.50	3794064
Dissolved Arsenic (As)	ug/L	<1.0		<1.0	1.0	3794064
Total Arsenic (As)	ug/L	<1.0	<1.0	<1.0	1.0	3796034
Dissolved Barium (Ba)	ug/L	48		32	2.0	3794064
Dissolved Beryllium (Be)	ug/L	<0.50		<0.50	0.50	3794064
Dissolved Bismuth (Bi)	ug/L	<1.0		<1.0	1.0	3794064
Dissolved Boron (B)	ug/L	410		620	10	3794064
Dissolved Cadmium (Cd)	ug/L	<0.10		<0.10	0.10	3794064
Total Cadmium (Cd)	ug/L	<0.10	<0.10	<0.10	0.10	3796034
Dissolved Calcium (Ca)	ug/L	95000		42000	200	3794064
Total Calcium (Ca)	ug/L	97000	96000	43000	200	3796034
Dissolved Chromium (Cr)	ug/L	<5.0		<5.0	5.0	3794064
Total Chromium (Cr)	ug/L	<5.0	<5.0	<5.0	5.0	3796034
Dissolved Cobalt (Co)	ug/L	<0.50		<0.50	0.50	3794064
Dissolved Copper (Cu)	ug/L	<1.0		<1.0	1.0	3794064
Total Copper (Cu)	ug/L	<1.0	<1.0	<1.0	1.0	3796034
Dissolved Iron (Fe)	ug/L	<100		<100	100	3794064
Total Iron (Fe)	ug/L	<100	100	270	100	3796034
Dissolved Lead (Pb)	ug/L	<0.50		<0.50	0.50	3794064
Total Lead (Pb)	ug/L	<0.50	<0.50	<0.50	0.50	3796034
Dissolved Lithium (Li)	ug/L	33		48	5.0	3794064
Dissolved Magnesium (Mg)	ug/L	21000		22000	50	3794064
Total Magnesium (Mg)	ug/L	22000	21000	23000	50	3796034
Dissolved Manganese (Mn)	ug/L	<2.0		<2.0	2.0	3794064
Total Manganese (Mn)	ug/L	6.6	6.7	13	2.0	3796034
Dissolved Molybdenum (Mo)	ug/L	1.4		2.2	0.50	3794064
Dissolved Nickel (Ni)	ug/L	<1.0		<1.0	1.0	3794064
Total Nickel (Ni)	ug/L	<1.0	1.3	1.3	1.0	3796034
Dissolved Phosphorus (P)	ug/L	<100		<100	100	3794064
Dissolved Potassium (K)	ug/L	8900		9700	200	3794064
Total Potassium (K)	ug/L	9400	9300	10000	200	3796034
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Lab-Dup = Laboratory Initiated Duplicate						

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)**

Maxxam ID		YB2414	YB2414	YB2415		
Sampling Date		2014/10/16 16:00	2014/10/16 16:00	2014/10/16 16:20		
COC Number		489245-01-01	489245-01-01	489245-01-01		
	Units	SW1	SW1 Lab-Dup	SW3	RDL	QC Batch
Dissolved Selenium (Se)	ug/L	<2.0		<2.0	2.0	3794064
Dissolved Silicon (Si)	ug/L	870		160	50	3794064
Dissolved Silver (Ag)	ug/L	<0.10		<0.10	0.10	3794064
Dissolved Sodium (Na)	ug/L	53000		77000	100	3794064
Total Sodium (Na)	ug/L	55000	55000	78000	100	3796034
Dissolved Strontium (Sr)	ug/L	1300		1500	1.0	3794064
Dissolved Tellurium (Te)	ug/L	<1.0		<1.0	1.0	3794064
Dissolved Thallium (Tl)	ug/L	<0.050		<0.050	0.050	3794064
Dissolved Tin (Sn)	ug/L	<1.0		<1.0	1.0	3794064
Dissolved Titanium (Ti)	ug/L	<5.0		<5.0	5.0	3794064
Dissolved Tungsten (W)	ug/L	<1.0		<1.0	1.0	3794064
Dissolved Uranium (U)	ug/L	0.80		0.60	0.10	3794064
Dissolved Vanadium (V)	ug/L	<0.50		<0.50	0.50	3794064
Dissolved Zinc (Zn)	ug/L	<5.0		<5.0	5.0	3794064
Total Zinc (Zn)	ug/L	<5.0	<5.0	<5.0	5.0	3796034
Dissolved Zirconium (Zr)	ug/L	<1.0		<1.0	1.0	3794064
RDL = Reportable Detection Limit						
QC Batch = Quality Control Batch						
Lab-Dup = Laboratory Initiated Duplicate						

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

### TEST SUMMARY

**Maxxam ID:** YB2414  
**Sample ID:** SW1  
**Matrix:** Water

**Collected:** 2014/10/16  
**Shipped:**  
**Received:** 2014/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	PH	3792953	N/A	2014/10/21	Surinder Rai
Chloride by Automated Colourimetry	AC	3795562	N/A	2014/10/24	Deonarine Ramnarine
Conductivity	COND	3792963	N/A	2014/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	3792438	N/A	2014/10/22	Elsamma Alex
Fluoride	F	3792964	2014/10/21	2014/10/21	Surinder Rai
Hardness (calculated as CaCO3)		3790306	N/A	2014/10/22	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	3794064	2014/10/22	2014/10/22	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	3796034	N/A	2014/10/24	Prempal Bhatti
Anion and Cation Sum	CALC	3790087	N/A	2014/10/22	Automated Statchk
Total Ammonia-N	LACH/NH4	3792773	N/A	2014/10/22	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	3793018	N/A	2014/10/23	Chandra Nandlal
Total Oil and Grease	BAL	3796958	2014/10/23	2014/10/24	Amjad Mir
pH	PH	3792962	N/A	2014/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	3792440	N/A	2014/10/21	Bramdeo Motiram
Sulphate by Automated Colourimetry	AC	3795563	N/A	2014/10/24	Deonarine Ramnarine
Total Dissolved Solids	SLDS	3792005	N/A	2014/10/21	Niki Shah
Total Kjeldahl Nitrogen in Water	AC	3799611	2014/10/26	2014/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	3796056	2014/10/23	2014/10/24	Sarabjit Raina
Total Suspended Solids	SLDS	3792004	N/A	2014/10/21	Gurpreet Kaur

**Maxxam ID:** YB2414 Dup  
**Sample ID:** SW1  
**Matrix:** Water

**Collected:** 2014/10/16  
**Shipped:**  
**Received:** 2014/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	AC	3795562	N/A	2014/10/24	Deonarine Ramnarine
Total Metals Analysis by ICPMS	ICP/MS	3796034	N/A	2014/10/24	Prempal Bhatti
Phenols (4AAP)	TECH/PHEN	3792440	N/A	2014/10/21	Bramdeo Motiram
Sulphate by Automated Colourimetry	AC	3795563	N/A	2014/10/24	Deonarine Ramnarine
Total Kjeldahl Nitrogen in Water	AC	3799611	2014/10/26	2014/10/27	Rajni Tyagi

**Maxxam ID:** YB2415  
**Sample ID:** SW3  
**Matrix:** Water

**Collected:** 2014/10/16  
**Shipped:**  
**Received:** 2014/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	PH	3792953	N/A	2014/10/21	Surinder Rai
Chloride by Automated Colourimetry	AC	3795562	N/A	2014/10/24	Deonarine Ramnarine
Conductivity	COND	3792963	N/A	2014/10/21	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	3792438	N/A	2014/10/22	Elsamma Alex
Fluoride	F	3792964	2014/10/21	2014/10/21	Surinder Rai
Hardness (calculated as CaCO3)		3790306	N/A	2014/10/22	Automated Statchk
Lab Filtered Metals by ICPMS	ICP/MS	3794064	2014/10/22	2014/10/22	Arefa Dabhad
Total Metals Analysis by ICPMS	ICP/MS	3796034	N/A	2014/10/24	Prempal Bhatti

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**TEST SUMMARY**

**Maxxam ID:** YB2415  
**Sample ID:** SW3  
**Matrix:** Water

**Collected:** 2014/10/16  
**Shipped:**  
**Received:** 2014/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Anion and Cation Sum	CALC	3790087	N/A	2014/10/22	Automated Statchk
Total Ammonia-N	LACH/NH4	3792773	N/A	2014/10/22	Charles Opoku-Ware
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	3793018	N/A	2014/10/23	Chandra Nandlal
Total Oil and Grease	BAL	3796958	2014/10/23	2014/10/24	Amjad Mir
pH	PH	3792962	N/A	2014/10/21	Surinder Rai
Phenols (4AAP)	TECH/PHEN	3792440	N/A	2014/10/21	Bramdeo Motiram
Sulphate by Automated Colourimetry	AC	3795563	N/A	2014/10/24	Deonarine Ramnarine
Total Dissolved Solids	SLDS	3792005	N/A	2014/10/21	Niki Shah
Total Kjeldahl Nitrogen in Water	AC	3799611	2014/10/26	2014/10/27	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	3796056	2014/10/23	2014/10/24	Sarabjit Raina
Total Suspended Solids	SLDS	3792004	N/A	2014/10/21	Gurpreet Kaur

**Maxxam ID:** YB2415 Dup  
**Sample ID:** SW3  
**Matrix:** Water

**Collected:** 2014/10/16  
**Shipped:**  
**Received:** 2014/10/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Phosphorus (Colourimetric)	LACH/P	3796056	2014/10/23	2014/10/24	Sarabjit Raina

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

### GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

### QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3792004	GKR	QC Standard	Total Suspended Solids	2014/10/21		96	%	85 - 115
3792004	GKR	Method Blank	Total Suspended Solids	2014/10/21	<10		mg/L	
3792004	GKR	RPD	Total Suspended Solids	2014/10/21	NC		%	25
3792005	NS1	QC Standard	Total Dissolved Solids	2014/10/21		99	%	90 - 110
3792005	NS1	Method Blank	Total Dissolved Solids	2014/10/21	<10		mg/L	
3792005	NS1	RPD	Total Dissolved Solids	2014/10/21	9.5		%	25
3792438	EAX	Matrix Spike	Dissolved Organic Carbon	2014/10/21		97	%	80 - 120
3792438	EAX	Spiked Blank	Dissolved Organic Carbon	2014/10/21		100	%	80 - 120
3792438	EAX	Method Blank	Dissolved Organic Carbon	2014/10/21	0.37 , RDL=0.20		mg/L	
3792438	EAX	RPD	Dissolved Organic Carbon	2014/10/21	NC		%	20
3792440	BMO	Matrix Spike [YB2414-06]	Phenols-4AAP	2014/10/21		103	%	80 - 120
3792440	BMO	Spiked Blank	Phenols-4AAP	2014/10/21		103	%	85 - 115
3792440	BMO	Method Blank	Phenols-4AAP	2014/10/21	<0.0010		mg/L	
3792440	BMO	RPD [YB2414-06]	Phenols-4AAP	2014/10/21	NC		%	20
3792773	COP	Matrix Spike	Total Ammonia-N	2014/10/22		NC	%	80 - 120
3792773	COP	Spiked Blank	Total Ammonia-N	2014/10/22		101	%	85 - 115
3792773	COP	Method Blank	Total Ammonia-N	2014/10/22	<0.050		mg/L	
3792773	COP	RPD	Total Ammonia-N	2014/10/22	0.89		%	20
3792953	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2014/10/21		95	%	85 - 115
3792953	SAU	Method Blank	Alkalinity (Total as CaCO3)	2014/10/21	<1.0		mg/L	
3792953	SAU	RPD	Alkalinity (Total as CaCO3)	2014/10/21	NC		%	25
3792962	SAU	Spiked Blank	pH	2014/10/21		102	%	98 - 103
3792962	SAU	RPD	pH	2014/10/21	1.1		%	N/A
3792963	SAU	Spiked Blank	Conductivity	2014/10/21		100	%	85 - 115
3792963	SAU	Method Blank	Conductivity	2014/10/21	<1.0		umho/c	
3792963	SAU	RPD	Conductivity	2014/10/21	NC		%	25
3792964	SAU	Matrix Spike	Fluoride (F-)	2014/10/21		103	%	80 - 120
3792964	SAU	Spiked Blank	Fluoride (F-)	2014/10/21		104	%	80 - 120
3792964	SAU	Method Blank	Fluoride (F-)	2014/10/21	<0.10		mg/L	
3792964	SAU	RPD	Fluoride (F-)	2014/10/21	NC		%	20
3793018	C_N	Matrix Spike	Nitrite (N)	2014/10/23		97	%	80 - 120
			Nitrate (N)	2014/10/23		92	%	80 - 120
3793018	C_N	Spiked Blank	Nitrite (N)	2014/10/23		98	%	80 - 120
			Nitrate (N)	2014/10/23		100	%	80 - 120
3793018	C_N	Method Blank	Nitrite (N)	2014/10/23	<0.010		mg/L	
			Nitrate (N)	2014/10/23	<0.10		mg/L	
3793018	C_N	RPD	Nitrate (N)	2014/10/23	0.36		%	25
3794064	ADA	Matrix Spike	Dissolved Aluminum (Al)	2014/10/22		108	%	80 - 120
			Dissolved Antimony (Sb)	2014/10/22		105	%	80 - 120
			Dissolved Arsenic (As)	2014/10/22		100	%	80 - 120
			Dissolved Barium (Ba)	2014/10/22		103	%	80 - 120
			Dissolved Beryllium (Be)	2014/10/22		102	%	80 - 120
			Dissolved Bismuth (Bi)	2014/10/22		96	%	80 - 120
			Dissolved Boron (B)	2014/10/22		105	%	80 - 120
			Dissolved Cadmium (Cd)	2014/10/22		104	%	80 - 120
			Dissolved Calcium (Ca)	2014/10/22		NC	%	80 - 120
			Dissolved Chromium (Cr)	2014/10/22		97	%	80 - 120
			Dissolved Cobalt (Co)	2014/10/22		98	%	80 - 120
			Dissolved Copper (Cu)	2014/10/22		101	%	80 - 120
			Dissolved Iron (Fe)	2014/10/22		100	%	80 - 120
			Dissolved Lead (Pb)	2014/10/22		96	%	80 - 120

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Lithium (Li)	2014/10/22		104	%	80 - 120
			Dissolved Magnesium (Mg)	2014/10/22		NC	%	80 - 120
			Dissolved Manganese (Mn)	2014/10/22		99	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/10/22		103	%	80 - 120
			Dissolved Nickel (Ni)	2014/10/22		93	%	80 - 120
			Dissolved Phosphorus (P)	2014/10/22		109	%	80 - 120
			Dissolved Potassium (K)	2014/10/22		106	%	80 - 120
			Dissolved Selenium (Se)	2014/10/22		102	%	80 - 120
			Dissolved Silicon (Si)	2014/10/22		102	%	80 - 120
			Dissolved Silver (Ag)	2014/10/22		93	%	80 - 120
			Dissolved Sodium (Na)	2014/10/22		NC	%	80 - 120
			Dissolved Strontium (Sr)	2014/10/22		NC	%	80 - 120
			Dissolved Tellurium (Te)	2014/10/22		104	%	80 - 120
			Dissolved Thallium (Tl)	2014/10/22		92	%	80 - 120
			Dissolved Tin (Sn)	2014/10/22		105	%	80 - 120
			Dissolved Titanium (Ti)	2014/10/22		102	%	80 - 120
			Dissolved Tungsten (W)	2014/10/22		99	%	80 - 120
			Dissolved Uranium (U)	2014/10/22		99	%	80 - 120
			Dissolved Vanadium (V)	2014/10/22		98	%	80 - 120
			Dissolved Zinc (Zn)	2014/10/22		97	%	80 - 120
			Dissolved Zirconium (Zr)	2014/10/22		110	%	80 - 120
3794064	ADA	Spiked Blank	Dissolved Aluminum (Al)	2014/10/22		102	%	80 - 120
			Dissolved Antimony (Sb)	2014/10/22		99	%	80 - 120
			Dissolved Arsenic (As)	2014/10/22		96	%	80 - 120
			Dissolved Barium (Ba)	2014/10/22		101	%	80 - 120
			Dissolved Beryllium (Be)	2014/10/22		100	%	80 - 120
			Dissolved Bismuth (Bi)	2014/10/22		95	%	80 - 120
			Dissolved Boron (B)	2014/10/22		104	%	80 - 120
			Dissolved Cadmium (Cd)	2014/10/22		99	%	80 - 120
			Dissolved Calcium (Ca)	2014/10/22		98	%	80 - 120
			Dissolved Chromium (Cr)	2014/10/22		94	%	80 - 120
			Dissolved Cobalt (Co)	2014/10/22		96	%	80 - 120
			Dissolved Copper (Cu)	2014/10/22		96	%	80 - 120
			Dissolved Iron (Fe)	2014/10/22		96	%	80 - 120
			Dissolved Lead (Pb)	2014/10/22		93	%	80 - 120
			Dissolved Lithium (Li)	2014/10/22		97	%	80 - 120
			Dissolved Magnesium (Mg)	2014/10/22		99	%	80 - 120
			Dissolved Manganese (Mn)	2014/10/22		96	%	80 - 120
			Dissolved Molybdenum (Mo)	2014/10/22		96	%	80 - 120
			Dissolved Nickel (Ni)	2014/10/22		93	%	80 - 120
			Dissolved Phosphorus (P)	2014/10/22		105	%	80 - 120
			Dissolved Potassium (K)	2014/10/22		102	%	80 - 120
			Dissolved Selenium (Se)	2014/10/22		98	%	80 - 120
			Dissolved Silicon (Si)	2014/10/22		99	%	80 - 120
			Dissolved Silver (Ag)	2014/10/22		88	%	80 - 120
			Dissolved Sodium (Na)	2014/10/22		98	%	80 - 120
			Dissolved Strontium (Sr)	2014/10/22		96	%	80 - 120
			Dissolved Tellurium (Te)	2014/10/22		100	%	80 - 120
			Dissolved Thallium (Tl)	2014/10/22		90	%	80 - 120
			Dissolved Tin (Sn)	2014/10/22		99	%	80 - 120
			Dissolved Titanium (Ti)	2014/10/22		98	%	80 - 120
			Dissolved Tungsten (W)	2014/10/22		94	%	80 - 120

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3794064	ADA	Method Blank	Dissolved Uranium (U)	2014/10/22		94	%	80 - 120
			Dissolved Vanadium (V)	2014/10/22		95	%	80 - 120
			Dissolved Zinc (Zn)	2014/10/22		98	%	80 - 120
			Dissolved Zirconium (Zr)	2014/10/22		104	%	80 - 120
			Dissolved Aluminum (Al)	2014/10/22	<5.0		ug/L	
			Dissolved Antimony (Sb)	2014/10/22	<0.50		ug/L	
			Dissolved Arsenic (As)	2014/10/22	<1.0		ug/L	
			Dissolved Barium (Ba)	2014/10/22	<2.0		ug/L	
			Dissolved Beryllium (Be)	2014/10/22	<0.50		ug/L	
			Dissolved Bismuth (Bi)	2014/10/22	<1.0		ug/L	
			Dissolved Boron (B)	2014/10/22	<10		ug/L	
			Dissolved Cadmium (Cd)	2014/10/22	<0.10		ug/L	
			Dissolved Calcium (Ca)	2014/10/22	<200		ug/L	
			Dissolved Chromium (Cr)	2014/10/22	<5.0		ug/L	
			Dissolved Cobalt (Co)	2014/10/22	<0.50		ug/L	
			Dissolved Copper (Cu)	2014/10/22	<1.0		ug/L	
			Dissolved Iron (Fe)	2014/10/22	<100		ug/L	
			Dissolved Lead (Pb)	2014/10/22	<0.50		ug/L	
			Dissolved Lithium (Li)	2014/10/22	<5.0		ug/L	
			Dissolved Magnesium (Mg)	2014/10/22	<50		ug/L	
			Dissolved Manganese (Mn)	2014/10/22	<2.0		ug/L	
			Dissolved Molybdenum (Mo)	2014/10/22	<0.50		ug/L	
			Dissolved Nickel (Ni)	2014/10/22	<1.0		ug/L	
			Dissolved Phosphorus (P)	2014/10/22	<100		ug/L	
			Dissolved Potassium (K)	2014/10/22	<200		ug/L	
			Dissolved Selenium (Se)	2014/10/22	<2.0		ug/L	
			Dissolved Silicon (Si)	2014/10/22	<50		ug/L	
Dissolved Silver (Ag)	2014/10/22	<0.10		ug/L				
Dissolved Sodium (Na)	2014/10/22	<100		ug/L				
Dissolved Strontium (Sr)	2014/10/22	<1.0		ug/L				
Dissolved Tellurium (Te)	2014/10/22	<1.0		ug/L				
Dissolved Thallium (Tl)	2014/10/22	<0.050		ug/L				
Dissolved Tin (Sn)	2014/10/22	<1.0		ug/L				
Dissolved Titanium (Ti)	2014/10/22	<5.0		ug/L				
Dissolved Tungsten (W)	2014/10/22	<1.0		ug/L				
Dissolved Uranium (U)	2014/10/22	<0.10		ug/L				
Dissolved Vanadium (V)	2014/10/22	<0.50		ug/L				
Dissolved Zinc (Zn)	2014/10/22	<5.0		ug/L				
Dissolved Zirconium (Zr)	2014/10/22	<1.0		ug/L				
3794064	ADA	RPD	Dissolved Aluminum (Al)	2014/10/22	NC		%	20
			Dissolved Antimony (Sb)	2014/10/22	NC		%	20
			Dissolved Arsenic (As)	2014/10/22	NC		%	20
			Dissolved Barium (Ba)	2014/10/22	2.8		%	20
			Dissolved Beryllium (Be)	2014/10/22	NC		%	20
			Dissolved Bismuth (Bi)	2014/10/22	NC		%	20
			Dissolved Boron (B)	2014/10/22	1.7		%	20
			Dissolved Cadmium (Cd)	2014/10/22	NC		%	20
			Dissolved Calcium (Ca)	2014/10/22	2.2		%	20
			Dissolved Chromium (Cr)	2014/10/22	NC		%	20
			Dissolved Cobalt (Co)	2014/10/22	NC		%	20
			Dissolved Copper (Cu)	2014/10/22	NC		%	20
			Dissolved Iron (Fe)	2014/10/22	NC		%	20

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Dissolved Lead (Pb)	2014/10/22	NC		%	20
			Dissolved Lithium (Li)	2014/10/22	NC		%	20
			Dissolved Magnesium (Mg)	2014/10/22	2.2		%	20
			Dissolved Manganese (Mn)	2014/10/22	4.7		%	20
			Dissolved Molybdenum (Mo)	2014/10/22	9.2		%	20
			Dissolved Nickel (Ni)	2014/10/22	NC		%	20
			Dissolved Phosphorus (P)	2014/10/22	NC		%	20
			Dissolved Potassium (K)	2014/10/22	0.77		%	20
			Dissolved Selenium (Se)	2014/10/22	NC		%	20
			Dissolved Silicon (Si)	2014/10/22	0.25		%	20
			Dissolved Silver (Ag)	2014/10/22	NC		%	20
			Dissolved Sodium (Na)	2014/10/22	2.9		%	20
			Dissolved Strontium (Sr)	2014/10/22	2.7		%	20
			Dissolved Tellurium (Te)	2014/10/22	NC		%	20
			Dissolved Thallium (Tl)	2014/10/22	NC		%	20
			Dissolved Tin (Sn)	2014/10/22	NC		%	20
			Dissolved Titanium (Ti)	2014/10/22	NC		%	20
			Dissolved Tungsten (W)	2014/10/22	NC		%	20
			Dissolved Uranium (U)	2014/10/22	NC		%	20
			Dissolved Vanadium (V)	2014/10/22	NC		%	20
			Dissolved Zinc (Zn)	2014/10/22	NC		%	20
			Dissolved Zirconium (Zr)	2014/10/22	NC		%	20
3795562	DRM	Matrix Spike [YB2414-02]	Dissolved Chloride (Cl)	2014/10/24		NC	%	80 - 120
3795562	DRM	Spiked Blank	Dissolved Chloride (Cl)	2014/10/24		104	%	80 - 120
3795562	DRM	Method Blank	Dissolved Chloride (Cl)	2014/10/24	<1		mg/L	
3795562	DRM	RPD [YB2414-02]	Dissolved Chloride (Cl)	2014/10/24	0.35		%	20
3795563	DRM	Matrix Spike [YB2414-02]	Dissolved Sulphate (SO4)	2014/10/24		NC	%	75 - 125
3795563	DRM	Spiked Blank	Dissolved Sulphate (SO4)	2014/10/24		103	%	80 - 120
3795563	DRM	Method Blank	Dissolved Sulphate (SO4)	2014/10/24	<1		mg/L	
3795563	DRM	RPD [YB2414-02]	Dissolved Sulphate (SO4)	2014/10/24	1.3		%	20
3796034	PBA	Matrix Spike [YB2414-07]	Total Arsenic (As)	2014/10/24		104	%	80 - 120
			Total Cadmium (Cd)	2014/10/24		105	%	80 - 120
			Total Calcium (Ca)	2014/10/24		NC	%	80 - 120
			Total Chromium (Cr)	2014/10/24		103	%	80 - 120
			Total Copper (Cu)	2014/10/24		100	%	80 - 120
			Total Iron (Fe)	2014/10/24		106	%	80 - 120
			Total Lead (Pb)	2014/10/24		101	%	80 - 120
			Total Magnesium (Mg)	2014/10/24		NC	%	80 - 120
			Total Manganese (Mn)	2014/10/24		99	%	80 - 120
			Total Nickel (Ni)	2014/10/24		103	%	80 - 120
			Total Potassium (K)	2014/10/24		104	%	80 - 120
			Total Sodium (Na)	2014/10/24		NC	%	80 - 120
			Total Zinc (Zn)	2014/10/24		104	%	80 - 120
3796034	PBA	Spiked Blank	Total Arsenic (As)	2014/10/24		106	%	80 - 120
			Total Cadmium (Cd)	2014/10/24		106	%	80 - 120
			Total Calcium (Ca)	2014/10/24		103	%	80 - 120
			Total Chromium (Cr)	2014/10/24		105	%	80 - 120
			Total Copper (Cu)	2014/10/24		105	%	80 - 120
			Total Iron (Fe)	2014/10/24		107	%	80 - 120
			Total Lead (Pb)	2014/10/24		103	%	80 - 120
			Total Magnesium (Mg)	2014/10/24		107	%	80 - 120
			Total Manganese (Mn)	2014/10/24		105	%	80 - 120

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**QUALITY ASSURANCE REPORT(CONT'D)**

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3796034	PBA	Method Blank	Total Nickel (Ni)	2014/10/24		105	%	80 - 120
			Total Potassium (K)	2014/10/24		108	%	80 - 120
			Total Sodium (Na)	2014/10/24		107	%	80 - 120
			Total Zinc (Zn)	2014/10/24		105	%	80 - 120
			Total Arsenic (As)	2014/10/24	<1.0		ug/L	
			Total Cadmium (Cd)	2014/10/24	<0.10		ug/L	
			Total Calcium (Ca)	2014/10/24	<200		ug/L	
			Total Chromium (Cr)	2014/10/24	<5.0		ug/L	
			Total Copper (Cu)	2014/10/24	<1.0		ug/L	
			Total Iron (Fe)	2014/10/24	<100		ug/L	
			Total Lead (Pb)	2014/10/24	<0.50		ug/L	
			Total Magnesium (Mg)	2014/10/24	<50		ug/L	
			Total Manganese (Mn)	2014/10/24	<2.0		ug/L	
			3796034	PBA	RPD [YB2414-07]	Total Nickel (Ni)	2014/10/24	<1.0
Total Potassium (K)	2014/10/24	<200					ug/L	
Total Sodium (Na)	2014/10/24	<100					ug/L	
Total Zinc (Zn)	2014/10/24	<5.0					ug/L	
Total Arsenic (As)	2014/10/24	NC					%	20
Total Cadmium (Cd)	2014/10/24	NC					%	20
Total Calcium (Ca)	2014/10/24	0.95					%	20
Total Chromium (Cr)	2014/10/24	NC					%	20
Total Copper (Cu)	2014/10/24	NC					%	20
Total Iron (Fe)	2014/10/24	NC					%	20
Total Lead (Pb)	2014/10/24	NC					%	20
Total Magnesium (Mg)	2014/10/24	2.2					%	20
Total Manganese (Mn)	2014/10/24	NC					%	20
Total Nickel (Ni)	2014/10/24	NC					%	20
3796056	SNR	Matrix Spike [YB2415-04]	Total Phosphorus	2014/10/24		102	%	80 - 120
			Total Phosphorus	2014/10/24		103	%	80 - 120
			Total Phosphorus	2014/10/24		96	%	80 - 120
			Total Phosphorus	2014/10/24	0.002 , RDL=0.002		mg/L	
			Total Phosphorus	2014/10/24	0.44		%	20
			Total Phosphorus	2014/10/24		95	%	85 - 115
3796958	AMJ	RPD	Total Oil & Grease	2014/10/24	1.8		%	25
			Total Oil & Grease	2014/10/24	<0.50		mg/L	
3799611	RTY	Matrix Spike [YB2414-04]	Total Kjeldahl Nitrogen (TKN)	2014/10/27		107	%	80 - 120
			Total Kjeldahl Nitrogen (TKN)	2014/10/27		113	%	80 - 120
3799611	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2014/10/27		99	%	80 - 120
			Total Kjeldahl Nitrogen (TKN)	2014/10/27	<0.10		mg/L	

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

**QUALITY ASSURANCE REPORT(CONT'D)**



QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
3799611	RTY	RPD [YB2414-04]	Total Kjeldahl Nitrogen (TKN)	2014/10/27	0.87		%	20
<p>N/A = Not Applicable</p> <p>Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.</p> <p>Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.</p> <p>QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.</p> <p>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.</p> <p>Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.</p> <p>NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).</p> <p>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 (one or both samples &lt; 5x RDL).</p>								

Maxxam Job #: B4J4786  
Report Date: 2014/10/27

Golder Associates Ltd  
Client Project #: 1407634  
Site Location: MCCARTHY QUARRY  
Sampler Initials: J.B

### VALIDATION SIGNATURE PAGE

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

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

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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.

Your Project #: 1407634  
Site#: 1407634  
Your C.O.C. #: 485991-07-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/10/31**  
Report #: R3207473  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4K0866**  
**Received: 2014/10/27, 10:02**

Sample Matrix: Water  
# Samples Received: 1

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Reference</b>
Low Level Total Suspended Solids	1	N/A	2014/10/29	CAM SOP-00428	SM 22 2540D m

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

**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.

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		YE2668		
<b>Sampling Date</b>				
<b>COC Number</b>		485991-07-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Inorganics</b>				
Total Suspended Solids	mg/L	4	1	3802995
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3802995	GKR	QC Standard	Total Suspended Solids	2014/10/29		97	%	85 - 115
3802995	GKR	Method Blank	Total Suspended Solids	2014/10/29	<1		mg/L	
3802995	GKR	RPD	Total Suspended Solids	2014/10/29	NC		%	25

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of 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 (one or both samples < 5x RDL).

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### VALIDATION SIGNATURE PAGE

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

*Cristina Carriere*

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Cristina Carriere, Scientific Services

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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.

Your Project #: 1407634  
Site#: 1407634  
Your C.O.C. #: 485991-07-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/10/31**  
Report #: R3207473  
Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4K0866**  
**Received: 2014/10/27, 10:02**

Sample Matrix: Water  
# Samples Received: 1

<b>Analyses</b>	<b>Quantity</b>	<b>Date Extracted</b>	<b>Date Analyzed</b>	<b>Laboratory Method</b>	<b>Reference</b>
Low Level Total Suspended Solids	1	N/A	2014/10/29	CAM SOP-00428	SM 22 2540D m

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

**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.

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		YE2668		
<b>Sampling Date</b>				
<b>COC Number</b>		485991-07-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Inorganics</b>				
Total Suspended Solids	mg/L	4	1	3802995
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### GENERAL COMMENTS

Results relate only to the items tested.

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3802995	GKR	QC Standard	Total Suspended Solids	2014/10/29		97	%	85 - 115
3802995	GKR	Method Blank	Total Suspended Solids	2014/10/29	<1		mg/L	
3802995	GKR	RPD	Total Suspended Solids	2014/10/29	NC		%	25

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

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of 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 (one or both samples < 5x RDL).

Maxxam Job #: B4K0866  
Report Date: 2014/10/31

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AB

### VALIDATION SIGNATURE PAGE

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

*Cristina Carriere*

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Cristina Carriere, Scientific Services

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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.

Your Project #: 1407634  
 Site#: 1407634  
 Your C.O.C. #: 485991-04-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/11/05**  
 Report #: R3212114  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4K5962**  
**Received: 2014/11/03, 10:05**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/11/05	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/11/05	2014/11/05	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/11/05	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/11/05	2014/11/05	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/11/03	CAM SOP-00428	SM 22 2540D m

\* 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

**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.

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		YG8916		
<b>Sampling Date</b>		2014/10/30		
<b>COC Number</b>		485991-04-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<1.6	1.6	3809054
<b>Inorganics</b>				
Phenols-4AAP	mg/L	0.0022	0.0010	3810806
Total Suspended Solids	mg/L	3	1	3809942
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<1.6	1.6	3812030
Total Oil & Grease Mineral/Synthetic	mg/L	<1.6	1.6	3812032
RDL = Reportable Detection Limit				
QC Batch = Quality Control Batch				

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### GENERAL COMMENTS

Sample YG8916-01 : Oil & Grease Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

**Results relate only to the items tested.**

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3809942	SUP	QC Standard	Total Suspended Solids	2014/11/03		98	%	85 - 115
3809942	SUP	Method Blank	Total Suspended Solids	2014/11/03	<1		mg/L	
3809942	SUP	RPD	Total Suspended Solids	2014/11/03	NC		%	25
3810806	BMO	Matrix Spike	Phenols-4AAP	2014/11/05		95	%	80 - 120
3810806	BMO	Spiked Blank	Phenols-4AAP	2014/11/05		102	%	85 - 115
3810806	BMO	Method Blank	Phenols-4AAP	2014/11/05	<0.0010		mg/L	
3810806	BMO	RPD	Phenols-4AAP	2014/11/05	NC		%	20
3812030	FA	Spiked Blank	Total Oil & Grease	2014/11/05		99	%	85 - 115
3812030	FA	RPD	Total Oil & Grease	2014/11/05	5.7		%	25
3812030	FA	Method Blank	Total Oil & Grease	2014/11/05	<0.50		mg/L	
3812032	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2014/11/05		94	%	85 - 115
3812032	FA	RPD	Total Oil & Grease Mineral/Synthetic	2014/11/05	2.6		%	25
3812032	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2014/11/05	<0.50		mg/L	

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 (one or both samples < 5x RDL).

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### VALIDATION SIGNATURE PAGE

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



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Brad Newman, Scientific Specialist

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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.

Your Project #: 1407634  
 Site#: 1407634  
 Your C.O.C. #: 485991-04-01

**Attention:Alicia Beynon**

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

**Report Date: 2014/11/05**  
 Report #: R3212114  
 Version: 1 - Final

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B4K5962**  
**Received: 2014/11/03, 10:05**

Sample Matrix: Water  
 # Samples Received: 1

Analyses	Quantity	Date		Laboratory Method	Reference
		Extracted	Analyzed		
Animal and Vegetable Oil & Grease	1	N/A	2014/11/05	CAM SOP-00326	SM 5520 B
Total Oil and Grease	1	2014/11/05	2014/11/05	CAM SOP-00326	EPA 1664B m
Phenols (4AAP)	1	N/A	2014/11/05	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2014/11/05	2014/11/05	CAM SOP-00326	SM 22 5520F m
Low Level Total Suspended Solids	1	N/A	2014/11/03	CAM SOP-00428	SM 22 2540D m

\* 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

**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.

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

**RESULTS OF ANALYSES OF WATER**

<b>Maxxam ID</b>		YG8916		
<b>Sampling Date</b>		2014/10/30		
<b>COC Number</b>		485991-04-01		
	<b>Units</b>	<b>POND</b>	<b>RDL</b>	<b>QC Batch</b>
<b>Calculated Parameters</b>				
Total Animal/Vegetable Oil and Grease	mg/L	<1.6	1.6	3809054
<b>Inorganics</b>				
Phenols-4AAP	mg/L	0.0022	0.0010	3810806
Total Suspended Solids	mg/L	3	1	3809942
<b>Petroleum Hydrocarbons</b>				
Total Oil & Grease	mg/L	<1.6	1.6	3812030
Total Oil & Grease Mineral/Synthetic	mg/L	<1.6	1.6	3812032
RDL = Reportable Detection Limit QC Batch = Quality Control Batch				

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### GENERAL COMMENTS

Sample YG8916-01 : Oil & Grease Analysis: Due to limited amount of sample available for analysis, a smaller than usual portion of the sample was used. Detection limits were adjusted accordingly.

**Results relate only to the items tested.**

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	Units	QC Limits
3809942	SUP	QC Standard	Total Suspended Solids	2014/11/03		98	%	85 - 115
3809942	SUP	Method Blank	Total Suspended Solids	2014/11/03	<1		mg/L	
3809942	SUP	RPD	Total Suspended Solids	2014/11/03	NC		%	25
3810806	BMO	Matrix Spike	Phenols-4AAP	2014/11/05		95	%	80 - 120
3810806	BMO	Spiked Blank	Phenols-4AAP	2014/11/05		102	%	85 - 115
3810806	BMO	Method Blank	Phenols-4AAP	2014/11/05	<0.0010		mg/L	
3810806	BMO	RPD	Phenols-4AAP	2014/11/05	NC		%	20
3812030	FA	Spiked Blank	Total Oil & Grease	2014/11/05		99	%	85 - 115
3812030	FA	RPD	Total Oil & Grease	2014/11/05	5.7		%	25
3812030	FA	Method Blank	Total Oil & Grease	2014/11/05	<0.50		mg/L	
3812032	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2014/11/05		94	%	85 - 115
3812032	FA	RPD	Total Oil & Grease Mineral/Synthetic	2014/11/05	2.6		%	25
3812032	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2014/11/05	<0.50		mg/L	

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 (one or both samples < 5x RDL).

Maxxam Job #: B4K5962  
Report Date: 2014/11/05

Golder Associates Ltd  
Client Project #: 1407634  
Sampler Initials: AR

### 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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AquaTox Testing & Consulting Inc.  
 11B Nicholas Beaver Rd.  
 RR 3  
 Guelph ON N1H 6H9  
 Tel: (519) 763-4412 Fax: (519) 763-4419

**TOXICITY TEST REPORT**

*Daphnia magna*

Page 1 of 2

Work Order : 226473  
 Sample Number : 41348

**SAMPLE IDENTIFICATION**

Company :	Golder Associates- Barrie	Time Collected :	12:00
Location :	Barrie ON	Date Collected :	2014-09-10
Substance :	Mccarthy Pond	Date Received :	2014-09-11
Sampling Method :	Grab	Date Tested :	2014-09-11
Sampled By :	A.B.	Temp. on arrival :	22.0° C
Sample Description :	Clear, green, odourless		
Test Method :	Reference Method for Determining Acute Lethality of Effluents to <i>Daphnia magna</i> . Environment Canada EPS 1/RM/14 (Second Edition, December 2000).		

**48-h TEST RESULTS**

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested.

**SODIUM CHLORIDE REFERENCE TOXICANT DATA**

Organism Batch :	Dm14-17		
Date Tested (yyyy/mm/dd) :	2014-09-03	Historical Mean LC50 :	6.2 g/L
LC50 (95% Confidence Limits) :	6.3 g/L (6.0 - 6.6)	Warning Limits (± 2SD) :	5.6 - 7.0 g/L
Statistical Method :	Binomial	Analyst(s) :	AW

***Daphnia magna* CULTURE HEALTH DATA**

Time to First Brood :	8.6 days	Mean Young Per Brood :	28.2
Culture Mortality :	0.4% (previous 7 days)		

**TEST CONDITIONS**

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Test Organisms / Replicate :	10
Test Aeration :	None	Total Organisms / Test Level :	30
Organism Batch :	Dm14-17	Organism Loading Rate :	15.0 mL/organism
		Test Method Deviation(s) :	None

Date: 2014-09-18  
 yyyy-mm-dd

Approved by: J. Mudas  
 Project Manager

Work Order: 226473  
 Sample Number: 41348

	Hardness (mg/L as CaCO <sub>3</sub> )	Hardness Adjustment	pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O <sub>2</sub> Sat. (%) <sup>*</sup>	Total Pre-Aeration Time (h) @ 30 mL/min/L
Initial Water Chemistry:	200	None	8.3	7.8	705	21.0	90	0:00

**0 hours**

Date & Time	2014-09-11	14:40						
Technician:	SEC/AW							
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%) <sup>*</sup>	Hardness
100A	0	0	8.3	7.8	705	21.0	90	200
100B	0	0	8.3	7.8	705	21.0	90	200
100C	0	0	8.3	7.8	705	21.0	90	200
Control A	0	0	8.1	8.5	469	21.0	100	220
Control B	0	0	8.1	8.5	469	21.0	100	220
Control C	0	0	8.1	8.5	469	21.0	100	220

Notes:

Date & Time	2014-09-12	14:40					Temp.
Technician:	SEC						Temp.
Test Conc. (%)	Mortality	Immobility	The parameters required for the semi-annual water quality monitoring at all three locations are listed in Table 3 of the ECA.				Temp.
100A	0	0					20.0
100B	0	0					20.0
100C	0	0					20.0
Control A	0	0					20.0
Control B	0	0					20.0
Control C	0	0					20.0

Notes:

**48 hours**

Date & Time	2014-09-13	14:40				
Technician:	CN					
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.
100A	0	0	8.5	8.5	730	20.0
100B	0	0	8.5	8.6	721	20.0
100C	0	0	8.5	8.6	723	20.0
Control A	0	0	8.6	8.5	481	20.0
Control B	0	0	8.6	8.7	475	20.0
Control C	0	0	8.6	8.6	475	20.0

Notes:

# of control organisms showing stress: 0  
*Daphnia* Batch #: Dm14-17

Number immobile does not include number of mortalities.

- = not measured

\* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: VC  
 Date: 2014-09-16



**AquaTox Testing & Consulting Inc.**  
 11B Nicholas Beaver Rd.  
 RR 3  
 Guelph ON N1H 6H9  
 Tel: (519) 763-4412 Fax: (519) 763-4419

**TOXICITY TEST REPORT**  
*Daphnia magna*  
 Page 1 of 2

Work Order : 226743  
 Sample Number : 41742

**SAMPLE IDENTIFICATION**

Company :	Golder Associates- Barrie	Time Collected :	16:30
Location :	Barrie ON	Date Collected :	2014-10-16
Substance :	SW3	Date Received :	2014-10-20
Sampling Method :	Grab	Date Tested :	2014-10-20
Sampled By :	J. B.	Temp. on arrival :	16.0° C
Sample Description :	Clear, light yellow, slight odour.		
Test Method :	Reference Method for Determining Acute Lethality of Effluents to <i>Daphnia magna</i> . Environment Canada EPS 1/RM/14 (Second Edition, December 2000).		

**48-h TEST RESULTS**

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested.

**SODIUM CHLORIDE REFERENCE TOXICANT DATA**

Organism Batch :	Dm14-20		
Date Tested (yyyy/mm/dd) :	2014-10-14	Historical Mean LC50 :	6.2 g/L
LC50 (95% Confidence Limits) :	6.2 g/L (5.8 - 6.6)	Warning Limits (± 2SD) :	5.6 - 6.9 g/L
Statistical Method :	Linear Regression (MLE)	Analyst(s) :	SEC

***Daphnia magna* CULTURE HEALTH DATA**

Time to First Brood :	9 days	Mean Young Per Brood :	22.8
Culture Mortality :	1.3% (previous 7 days)		

**TEST CONDITIONS**

Sample Treatment :	None	Number of Replicates :	3
pH Adjustment :	None	Test Organisms / Replicate :	10
Test Aeration :	None	Total Organisms / Test Level :	30
Organism Batch :	Dm14-20	Organism Loading Rate :	15.0 mL/organism
		Test Method Deviation(s) :	None

Date: 2014-10-29  
 yyyy-mm-dd

Approved by: [Signature]  
 Project Manager

Work Order: 226743  
 Sample Number: 41742

	Hardness (mg/L as CaCO <sub>3</sub> )	Hardness Adjustment	pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O <sub>2</sub> Sat. (%) <sup>*</sup>	Total Pre-Aeration Time (h) @ 30 mL/min/L
Initial Water Chemistry:	200	None	8.3	8.6	758	21.0	100	0:00

**0 hours**

Date & Time	2014-10-20	15:55						
Technician:	AW							
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%) <sup>*</sup>	Hardness
100A	0	0	8.3	8.6	758	21.0	100	200
100B	0	0	8.3	8.6	758	21.0	100	200
100C	0	0	8.3	8.6	758	21.0	100	200
Control A	0	0	8.4	8.4	492	21.0	99	200
Control B	0	0	8.4	8.4	492	21.0	99	200
Control C	0	0	8.4	8.4	492	21.0	99	200

Notes:

**24 hours**

Date & Time	2014-10-21	15:55						
Technician:	SEC							
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.		
100A	0	0	-	-	-	20.0		
100B	0	0	-	-	-	20.0		
100C	0	0	-	-	-	20.0		
Control A	0	0	-	-	-	20.0		
Control B	0	0	-	-	-	20.0		
Control C	0	0	-	-	-	20.0		

Notes:

**48 hours**

Date & Time	2014-10-22	15:55						
Technician:	AW							
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.		
100A	0	0	8.4	8.3	779	21.0		
100B	0	0	8.4	8.4	767	21.0		
100C	0	0	8.4	8.4	775	21.0		
Control A	0	0	8.5	8.7	504	21.0		
Control B	0	0	8.5	8.6	499	21.0		
Control C	0	0	8.5	8.7	496	21.0		

Notes:

# of control organisms showing stress: 0  
*Daphnia* Batch #: Dm14-20

Number immobile does not include number of mortalities.

- = not measured

\* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: VC

Date: 2014-10-29



**AquaTox Testing & Consulting Inc.**  
 11B Nicholas Beaver Rd.  
 RR 3  
 Guelph ON N1H 6H9  
 Tel: (519) 763-4412 Fax: (519) 763-4419

Work Order : 226743  
 Sample Number : 41742

**SAMPLE IDENTIFICATION**

Company :	Golder Associates- Barrie	Time Collected :	16:30
Location :	Barrie ON	Date Collected :	2014-10-16
Substance :	SW3	Date Received :	2014-10-20
Sampling Method :	Grab	Date Tested :	2014-10-20
Sampled By :	J. B.	Temp. on arrival :	16.0°C
Sample Description :	Clear, light yellow, slight odour.		
Test Method :	Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 amendments).		

**96-h TEST RESULTS**

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested.

**POTASSIUM CHLORIDE REFERENCE TOXICANT DATA**

Organism Batch :	T14-15	Historical Mean LC50 :	3774 mg/L
Date Tested (yyyy-mm-dd) :	2014-10-16	Warning Limits (± 2SD) :	3257 - 4372 mg/L
LC50 (95% Confidence Limits) :	3557 mg/L (3157 - 4000)	Analyst(s) :	MA, CN
Statistical Method :	Linear Regression (MLE)		

**TEST FISH**

Control Fish Sample Size :	10	Cumulative stock tank mortality:	0 % (prev. 7 days)
Mean Fish Weight (± 2 SD) :	0.38 ± 0.26 g	Mean Fish Fork Length (± 2 SD) :	34.6 ± 8.8 mm
Range of Weights :	0.22 - 0.57 g	Range of Fork Lengths (mm) :	29 - 41 mm
Fish Loading Rate :	0.2 g/L		

**TEST CONDITIONS**

Test Organism :	<i>Oncorhynchus mykiss</i>	Volume Tested (L) :	18
Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms Per Replicate :	10
Test Aeration :	Yes	Total Organisms Per Test Level :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Test Method Deviation(s) :	None

Date: 2014-10-29  
 yyyy-mm-dd

Approved by:   
 Project Manager

Work Order: 226743  
 Sample Number: 41742

Total Pre-Aeration Time (h)		pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O <sub>2</sub> Sat. (%)*
0:30	Initial Water Chemistry:	8.0	9.0	746	15.0	-
	Chemistry after 30min air:	8.0	9.2	747	15.0	95

0 hours

Date & Time	2014-10-20	14:00					
Technician:	MA/FS						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	8.0	9.2	747	15.0	95
Control	0	0	8.2	9.9	815	14.0	100

Notes:

24 hours

Date & Time	2014-10-21	14:00					
Technician:	MA(FS)						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

48 hours

Date & Time	2014-10-22	14:00					
Technician:	MA(FS)						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

72 hours

Date & Time	2014-10-23	14:00					
Technician:	MA(FS)						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

96 hours

Date & Time	2014-10-24	14:00					
Technician:	MA(FS)						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	
100	0	0	8.1	9.7	756	15.0	
Control	0	0	8.2	9.6	765	15.0	

Notes:

# of control organisms showing stress: 0

Trout Batch #: T14-15

"-" = not measured

Number immobile does not include number of mortalities.

\* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: VC

Date: 2014-10-29

CHAIN OF CUSTODY RECORD



AquaTox Work Order No:  
226743

Shipping Address: AquaTox Testing & Consulting Inc.  
11B Nicholas Beaver Road, RR #3  
Guelph, Ontario Canada N1H 6H9

Voice: (519) 763-4412 Fax: (519) 763-4419

P.O. Number: 1407634 (Job #)  
 Field Sampler Name (print): J Bonany  
 Signature: *J Bonany*  
 Affiliation: Golder Associates  
 Sample Storage (prior to shipping): 3 gallon pail.  
 Custody Relinquished by: Sammie Bonany  
 Date/Time Shipped: 17110117 2:30 p.m.

Client: Golder Associates  
 Alicia Beynon  
 121 Commerce Park Dr. Unit L  
 Barrie, ON L4N 8X1  
 Phone: (705) 722-4492  
 Fax: (705) 722-3786  
 Contact: Alicia-Beynon@golder.com

Sample Identification		AquaTox Sample Number	Temp. on arrival	Analyses Requested										Sample Method and Volume		
Date Collected (yyyy-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)			Sample Name	Rainbow Trout Single Concentration	Rainbow Trout LC50	Daphnia magna Single Concentration	Daphnia magna LC50	Fathead Minnow Survival & Growth	Ceriodaphnia dubia Survival & Reproduction	Lemna minor Growth	Pseudokirchnerella subcapitata Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
2014/12/16	16:30	41149	16.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	1 X 20 L	OK	

For Lab Use Only  
 Received By: *DK*  
 Date: 2014-10-20  
 Time: 11:30  
 Storage Location:  
 Storage Temp. (°C):

Please list any special requests or instructions:

As per SIC



AquaTox Testing & Consulting Inc.  
 11B Nicholas Beaver Rd.  
 RR 3  
 Guelph ON N1H 6H9  
 Tel: (519) 763-4412 Fax: (519) 763-4419

Work Order : 226473  
 Sample Number : 41348

**SAMPLE IDENTIFICATION**

Company :	Golder Associates- Barrie	Time Collected :	12:00
Location :	Barrie ON	Date Collected :	2014-09-10
Substance :	Mccarthy Pond	Date Received :	2014-09-11
Sampling Method :	Grab	Date Tested :	2014-09-12
Sampled By :	A.B.	Temp. on arrival :	22.0°C
Sample Description :	Clear, green, odourless		
Test Method :	Reference Method for Determining Acute Lethality of Liquid Effluents to Rainbow Trout. Environment Canada, EPS 1/RM/13 (2nd Edition, December 2000, with May 2007 amendments).		

**96-h TEST RESULTS**

Substance	Effect	Value
Control	Mean Immobility	0.0 %
	Mean Mortality	0.0 %
100%	Mean Immobility	0.0 %
	Mean Mortality	0.0 %

The results reported relate only to the sample tested.

**POTASSIUM CHLORIDE REFERENCE TOXICANT DATA**

Organism Batch :	T14-13	Historical Mean LC50 :	3804 mg/L
Date Tested (yyyy-mm-dd) :	2014-09-10	Warning Limits (± 2SD) :	3280 - 4412 mg/L
LC50 (95% Confidence Limits) :	4317 mg/L (4026 - 4628)	Analyst(s) :	MA, FS, DK
Statistical Method :	Spearman-Kärber		

**TEST FISH**

Control Fish Sample Size :	10	Cumulative stock tank mortality:	0 % (prev. 7 days)
Mean Fish Weight (± 2 SD) :	0.53 ± 0.35 g	Mean Fish Fork Length (± 2 SD) :	38.3 ± 8.4 mm
Range of Weights :	0.24 - 0.88 g	Range of Fork Lengths (mm) :	30 - 46 mm
Fish Loading Rate :	0.3 g/L		

**TEST CONDITIONS**

Test Organism :	<i>Oncorhynchus mykiss</i>	Volume Tested (L) :	18
Sample Treatment :	None	Number of Replicates :	1
pH Adjustment :	None	Organisms Per Replicate :	10
Test Aeration :	Yes	Total Organisms Per Test Level :	10
Pre-aeration/Aeration Rate :	6.5 ± 1 mL/min/L	Test Method Deviation(s) :	None

Date: 2014-09-18  
 yyyy-mm-dd

Approved by: [Signature]  
 Project Manager

Work Order: 226473  
 Sample Number: 41348

Total Pre-Aeration Time (h)		pH	D.O. (mg/L)	Cond. (µmhos/cm)	Temp. (°C)	O <sub>2</sub> Sat. (%)*
0:30	Initial Water Chemistry:	8.0	8.1	703	15.0	-
	Chemistry after 30min air:	8.1	8.4	703	15.0	87

**0 hours**

Date & Time	2014-09-12	11:55					
Technician:	MA/FS						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	8.1	8.4	703	15.0	87
Control	0	0	8.4	9.8	831	15.0	100

Notes:

**24 hours**

Date & Time	2014-09-13	11:55					
Technician:	DK						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

**48 hours**

Date & Time	2014-09-14	11:55					
Technician:	DK						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

**72 hours**

Date & Time	2014-09-15	11:55					
Technician:	FS						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	-	-	-	15.0	
Control	0	0	-	-	-	15.0	

Notes:

**96 hours**

Date & Time	2014-09-16	11:55					
Technician:	MA						
Test Conc. (%)	Mortality	Immobility	pH	D.O.	Cond.	Temp.	O <sub>2</sub> Sat. (%)*
100	0	0	8.2	9.5	709	15.0	
Control	0	0	8.3	9.6	797	15.0	

Notes:

# of control organisms showing stress: 0

Trout Batch #: T14-13

"-" = not measured

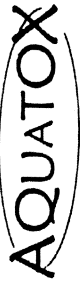
Number immobile does not include number of mortalities.

\* adjusted for actual temp. & barometric pressure

Test Data Reviewed By: VC

Date: 2014-09-17

**CHAIN OF CUSTODY RECORD**



AquaTox Work Order No:

226473

**Shipping Address:** AquaTox Testing & Consulting Inc.  
11B Nicholas Beaver Road, RR #3  
Guelph, Ontario Canada N1H 6H9

**Voice:** (519) 763-4412      **Fax:** (519) 763-4419

P.O. Number: 1406263-COCO-McCarthy

Field Sampler Name (print): Alicia Baynes

Signature: *Alicia Baynes*

Affiliation: ambient

Sample Storage (prior to shipping): ambient

Custody Relinquished by: *Alicia Baynes*

Date/Time Shipped: Sept 10, 2014

Client: GOLDER ASSOCIATES  
Barrie  
121 Commerce Park Drive

Phone: 705-722-4492

Fax: " " 3786

Contact: John Easton/Alicia Baynes

Sample Identification			Analyses Requested										Sample Method and Volume			
Date Collected (YYYY-mm-dd)	Time Collected (e.g. 14:30, 24 hr clock)	Sample Name	AquaTox Sample Number	Temp. on arrival	Rainbow Trout Single Concentration	Rainbow Trout LC50	Daphnia magna Single Concentration	Daphnia magna LC50	Fathead Minnow Survival & Growth	Ceriodaphnia dubia Survival & Reproduction	Lemna minor Growth	Pseudokirchnerella subcapitata Growth	Other (please specify below)	Grab	Composite	# of Containers and Volume (eg. 2 x 1L, 3 x 10L, etc.)
Sept 10 2014	12:00	Daphnia magna	41348	22.0	X	<del>X</del>	X							✓		
	12:00	Freshwater Pond														

**For Lab Use Only**

Received By: CN

Date: 2014-09-11

Time: 12:30

Storage Location:

Storage Temp.(°C)

Please list any special requests or instructions:

*JGB*

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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