REPORT

MCCARTHY QUARRY

Environmental Compliance Approval Annual Report

Submitted to:

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Ministry of the Environment, Conservation and Parks
Barrie District Office
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Submitted by:

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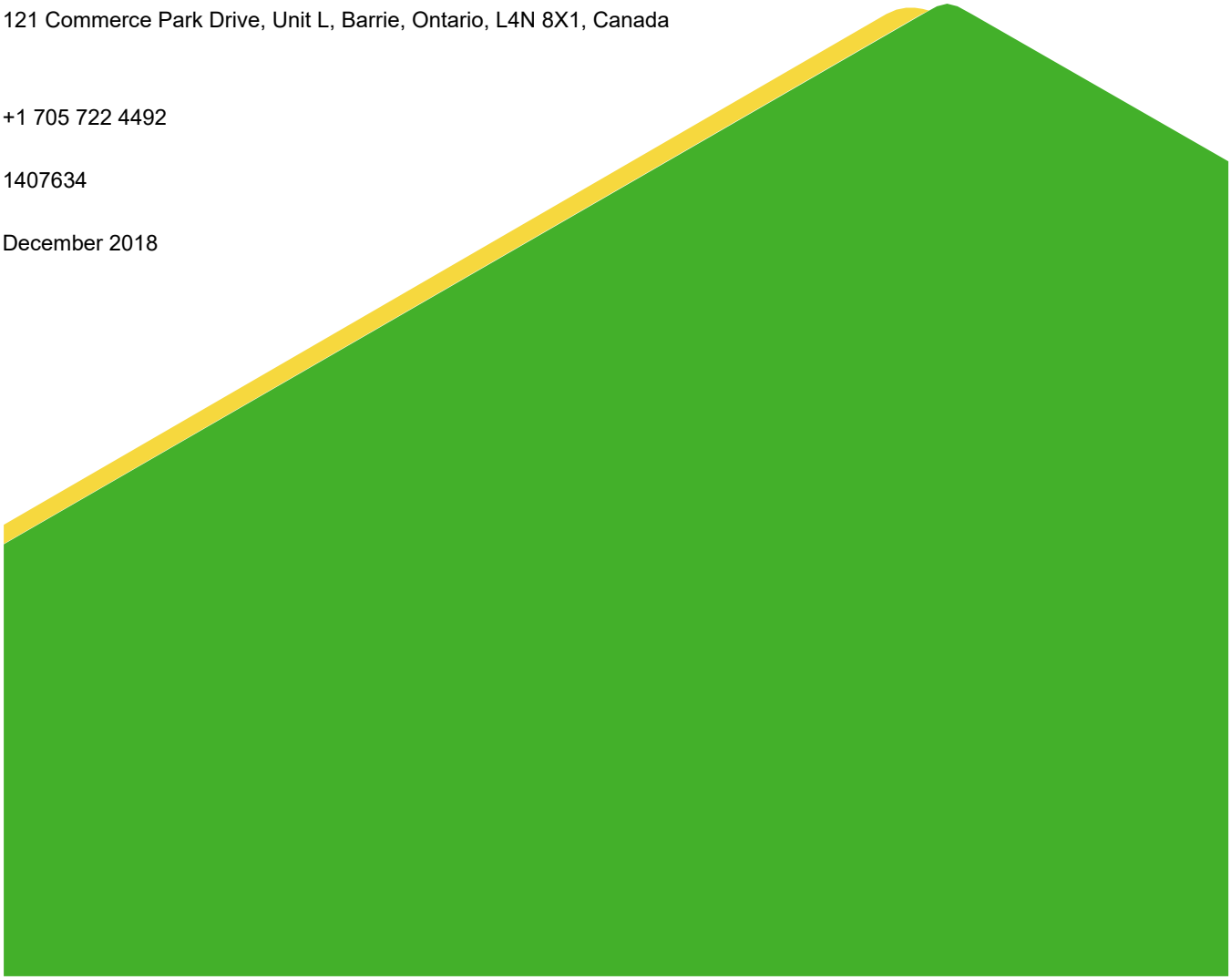
1407634

December 2018



Distribution List

1 Copy - Ministry of the Environment, Conservation and Parks

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E Copy - Golder Associates Ltd.

Table of Contents

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by QBJR/Coco Aggregates Inc. (Coco) to prepare the annual compliance report for the McCarthy Quarry located in the Township of Ramara, County of Simcoe (Figure 1), as a requirement 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.

The following report includes a summary of the requirements listed in Section 10(5) of the ECA for the period from November 1, 2017 to October 31, 2018. Included herein are a summary of:

- Quarry discharge monitoring data including the water quality results and flow measurements;
- Any operation problems encountered;
- Maintenance work completed on any part of the sewage works;
- Quarry discharge quality assurance or control measures undertaken; and
- Calibration and maintenance carried out on the quarry discharge monitoring equipment.

2.0 BACKGROUND

The McCarthy Quarry dewatering system consists of the collection of groundwater and surface water at the base of the quarry floor to a settling pond to the south of the active quarry area (Figure 1). Groundwater and precipitation that enters the quarry is collected in a sump at the base of the quarry floor. The sump is equipped with a 4-inch Grindex pump which is rated at 35 L/sec and is attached to a 4-inch discharge line. Water is pumped from the quarry floor up the quarry face to a 101 mm diameter pipeline that directs the water to the 14,000 m^3 settling pond. The water in the settling pond is equipped with a Hickenbottom control structure that discharges the water to the roadside ditch along Concession Road 1. The water flows eastward along the north side of Concession Road 1 to a municipal drain and eventually to the Talbot River, which discharges into Lake Simcoe.

The dewatering activities from the McCarthy Quarry are currently carried out under the existing Permit to Take Water (PTTW) No. 7818-9QJNL4 (Appendix B) issued on December 30, 2014. Under the current PTTW Coco is permitted to pump water from the quarry sump at a rate of 4,545 L/min.

3.0 QUARRY DISCHARGE MONITORING

3.1 Quarry discharge Monitoring Requirements

Quarry discharge 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.

Condition 7(2)

Weekly quarry discharge monitoring is required at the McCarthy Pond for Total Suspended Solids (TSS), Oil and Grease and Phenols (4AAP). These results are summarized in Table 1 and the monthly averages are summarized in Table 2. No sample was collected for the weeks when quarry staff reported there was no discharge at the time of sampling.

The weekly quarry discharge samples (Section 7(2)) were collected by staff at the McCarthy Quarry. The weekly quality samples were sent to Maxxam Analytics Laboratory for analysis; laboratory analysis results are included in Appendix C.

Condition 7(3) and Condition 7(7)

Additional water quality sampling is required under Section 7(3) at a semi-annual frequency at all three locations, recognizing that, as of April 24, 2014 this monitoring was reduced from weekly sampling frequency to a semi-annual frequency following one year of quarry operation according to Section 7(7). The parameters required for semi-annual water quality monitoring at all three locations are listed in Table 3 of the ECA.

The semi-annual water quality samples (Section 7(3) and Section 7(7)) were collected by Golder. The semi-annual water quality samples were sent to Maxxam Analytics Laboratory for analysis. The laboratory analysis results are included in Appendix C.

Condition 7(8)

An inline flow meter was 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 the McCarthy Quarry. These results are summarized in Table 7.

Condition 8

Monthly lethality monitoring for Rainbow Trout and *Daphna magna* is also required and these results are summarized in Table 6.

The monthly lethality testing was carried out by Golder and sent to AGAT Laboratories Ltd. The laboratory analysis results are included in Appendix C.

4.0 QUARRY DISCHARGE MONITORING RESULTS

Condition 7(2)

No exceedances occurred during this monitoring period; the TSS, pH, Oil and Grease, Phenols (4AAP) concentrations were all below the daily (Table 1) and monthly (Table 2) concentration limits of the ECA.

The TSS exceedances observed historically at the site are considered to be the result of the small quarry footprint. When the quarry was in its initial stages and the area in which the work was being completed is relatively small, the dust that was generated from the quarry activities settled on the quarry floor which was then repeatedly disturbed by the quarry traffic. In addition to this, the sump is located within this work area which does not allow the rock dust to settle out before it reaches the sump. As the quarry has started to expand and working space increased, the amount of dust entering the sump has decreased. With less dust entering the sump the TSS concentrations have decreased in 2017 and 2018 in comparison to previous years.

Condition 7(3)

At the McCarthy Pond, all of the parameters tested are below the Provincial Water Quality Objectives (PWQO); results are provided in Table 3. No sampled was collected in October 2018 as there was no quarry discharge at the time of sampling.

At SW1, all of the parameters tested were below the PWQO with the exception of phosphorus on May 30, 2018 and iron and phosphorus on October 30, 2018 (Table 4).

At SW2, all of the parameters tested were below the PWQO with the exception of iron on May 30, 2018 and phosphorus on October 30, 2018 (Table 5).

Elevated phosphorous concentrations are observed upstream, on-Site, and at downstream ditch locations. The presence of elevated phosphorus at all three locations indicates that the phosphorous is most likely the result of farming activities in the area. There are a number of cattle farms in the area which could be attributing to the high phosphorous concentrations at SW1 and SW2.

Condition 8

The quarry discharge was found to be non-lethal to Rainbow Trout and *Daphnia magna* between November 2017 and October 2018 (Table 6). For both *Daphnia magna* and Rainbow Trout there has been 0% mortality between November 2017 and October 2018. The monthly lethality sample was not collected from the McCarthy Pond during the months of June, July, September and October 2018 as there was no quarry discharge at the time of sampling.

5.0 MEASURED DISCHARGE FROM QUARRY SUMP

The rate and volume of discharge from the quarry is measured on-Site by an inline flow meter in the discharge line from the quarry sump. The pump records are provided by McCarthy Quarry staff. The pump records for November 1, 2017 to October 31, 2018 are found in Table 7. The discharge rates were below the permitted rate of 4,545 L/min (76 L/sec).

Additionally, there has been no indication of erosion and/or flooding of the downstream ditches.

6.0 OPERATIONAL PROBLEMS AND CORRECTIVE ACTIONS TAKEN

No operational problems were encountered with the dewatering system during the monitoring period of November 2017 to October 2018. Additionally, no spills occurred during the November 2017 to October 2018 monitoring period.

7.0 MAINTENANCE OF SEWAGE WORKS

No upgrades or maintenance works were carried out on any part of the sewage works during the November 2017 to October 2018 monitoring period.

8.0 QUARRY DISCHARGE QUALITY ASSURANCE OR CONTROL MEASURES

No major quarry discharge quality assurance or control measures were put in place during this monitoring period.

9.0 CALIBRATION AND MAINTENANCE OF THE QUARRY DISCHARGE MONITORING EQUIPMENT

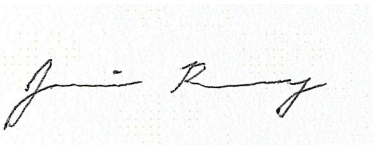
No calibration or maintenance of the quarry discharge monitoring equipment was completed between November 2017 and October 2018.

10.0 SUMMARY

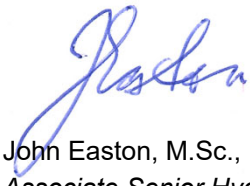
- Condition 7(2):
  - All of the weekly quarry discharge monitoring samples from the McCarthy Pond were below the daily concentration limits; and
  - All of the monthly quarry discharge concentrations for the McCarthy Pond were below the monthly concentration limits.
- Condition 7(3):
  - At the McCarthy Pond, all parameters were below the PWQO;
  - At SW1, all parameters were below the PWQO with the exception of phosphorus on May 30, 2018 and iron and phosphorus on October 30, 2018; and
  - At SW2 all parameters were below the PWQO with the exception of iron on May 30, 2018 and phosphorus on October 30, 2018.
- Condition 8:
  - The quarry discharge has been non-lethal to Rainbow Trout and *Daphnia magna* throughout the monitoring period (November 2017 to October 2018).
- Condition 7(8):
  - A continuous record of flow rates has been maintained throughout this monitoring period and all water takings were below the permitted rate of 4,545 L/min.

Signature Page

Golder Associates Ltd.



Jamie Bonany, M.A.Sc.
Project Scientist



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

JEB/JAE/cdr

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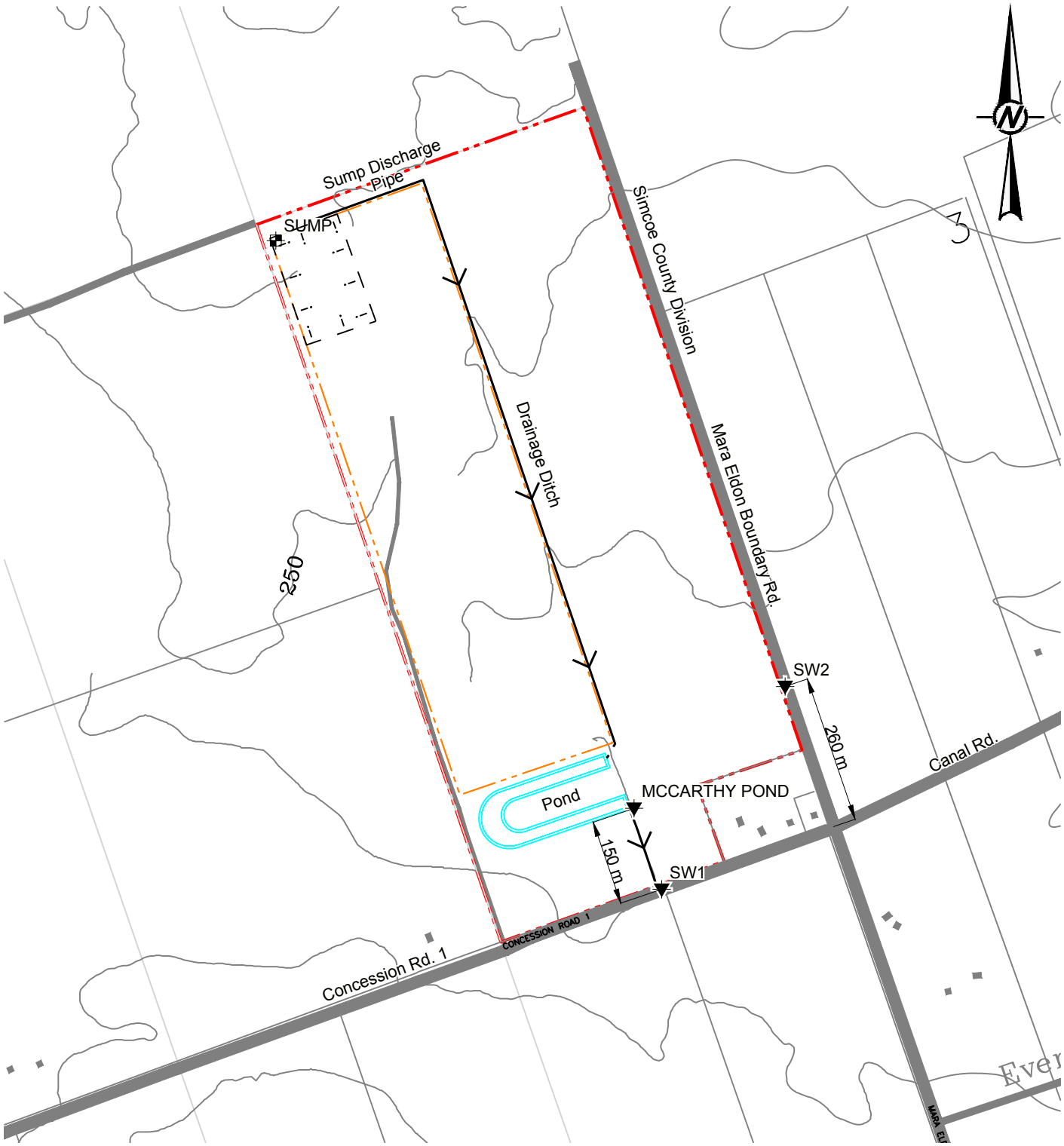
Figures



LEGEND

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

REFERENCES AND NOTES

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

0 200 400 600 m

1:10000

CLIENT
COCO / QBJR AGGREGATES INC.

PROJECT
STAN McCARTHY QUARRY

TITLE
LOCATION MAP

CONSULTANT
GOLDER

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

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

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TABLES

Table 1: Condition 7(2) McCarthy Pond Weekly Water Quality Results

	Unit	RDL	PWQO [1]	Daily Limit[2]	McCarthy Quarry													
Sample ID					**Pond**													
Date					02-Nov-17	09-Nov-17	16-Nov-17	23-Nov-17	30-Nov-17	07-Dec-17	18-May-18	24-May-18	31-May-18	07-Jun-18	14-Jun-18	09-Aug-18	16-Aug-18	23-Aug-18	30-Aug-18
pH	pH	n/a		6.0-9.5	8.19	7.63	7.59	8.04	8.16	8.20	8.19	8.38	8.31	8.73	8.81	8.30	8.25	8.23	8.14
Total Suspended Solids	mg/L	1		30	3	3	3	3	2	4	3	3	3	5	5	5	6	6	11
Total Oil and Grease	mg/L	0.5	Note 3	30	<0.5	1.1	<0.5	<0.5	<0.5	2.7	0.9	<0.5	0.6	2.7	3.1	6.1	0.8	0.8	2.5
Phenols (4AAP)	mg/L	<0.0010		0.04	<0.001	0.0010	0.0012	<0.001	<0.001	<0.001	<0.001	0.0010	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Notes

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

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

	Unit	RDL	PWQO [1]	Monthly Concentration Limit[2]	McCarthy Quarry											
Sample ID					**Pond**											
Date					November	December	January	February	March	April	May	June	July	August	September	October
Total Suspended Solids	mg/L	1		15	2.8	4.0	-	-	-	-	3.0	5.0	-	7.0	-	-
Total Oil and Grease	mg/L	0.5	Note 3	15	0.6	2.7	-	-	-	-	0.7	2.9	-	2.6	-	-
Phenols (4AAP)	mg/L	<0.0010		0.02	0.001	<0.001	-	-	-	-	0.001	<0.001	-	<0.001	-	-

Notes

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

Table 3: Condition 7(3) McCarthy Pond Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry
Sample ID						**Pond**
Date						**30-May-18**
Field Measured Parameters						
Conductivity	mS/cm					853
pH	pH	n/a	6.5-8.5		6.0-9.5	8.55
Temperature	°C	n/a				26.4
Calculated Parameters						
Hardness (CaCO3)	mg/L	1.0				240
Inorganics						
Total Ammonia-N	mg/L	0.050				0.16
Conductivity	umho/cm	1.0				0.848
Total Dissolved Solids	mg/L	10				525
Fluoride (F-)	mg/L	0.10				0.50
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.60
Dissolved Organic Carbon	mg/L	0.20				7.5
pH	pH	N/A	6.5-8.5		6.0-9.5	8.21
Phenols-4AAP	mg/L	0.0010			0.04	<0.0010
Total Phosphorus	mg/L	0.002		0.02[5b]		<0.020
Total Suspended Solids	mg/L	10			30	<10
Dissolved Sulphate (SO4)	mg/L	1				230
Alkalinity (Total as CaCO3)	mg/L	1.0				110
Dissolved Chloride (Cl)	mg/L	1				60
Nitrite (N)	mg/L	0.010				<0.010
Nitrate (N)	mg/L	0.10				<0.10
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50
Metals						
Total Arsenic (As)	ug/L	1	100	5		<1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10
Total Calcium (Ca)	ug/L	200				51000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0
Total Iron (Fe)	ug/L	100	300			<100
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50
Total Magnesium (Mg)	ug/L	50				25000
Total Manganese (Mn)	ug/L	2				64
Total Nickel (Ni)	ug/L	1	25			1.5
Total Potassium (K)	ug/L	200				9300
Total Sodium (Na)	ug/L	100				74000
Total Zinc (Zn)	ug/L	5	30	20		<5.0

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

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

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

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

5a. Aluminum (Interim):

- At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples.
- At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs.
- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

5b. Phosphorus (Interim):

- Current scientific evidence is insufficient to develop a firm Objective at this time.
- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:
(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;
(b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to

5c. Beryllium :

5d. Cadmium: (Interim)

5e. Chromium :

5f. Copper: (Interim)

5g. Lead :

5h. Lead: (Interim)

Table 4: Condition 7(3) SW1 Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry	
Sample ID						**SW1**	**SW1**
Date						**30-May-18**	**30-Oct-18**
Field Measured Parameters							
Conductivity	mS/cm					910	1172
pH	pH	n/a	6.5-8.5		6.0-9.5	8.27	8.18
Temperature	°C	n/a				29.8	11.4
Calculated Parameters							
Anion Sum	me/L	N/A				9.82	9.82
Cation Sum	me/L	N/A				10.3	10.3
Hardness (CaCO3)	mg/L	1.0				240	500
Inorganics							
Total Ammonia-N	mg/L	0.050				0.14	0.31
Conductivity	umho/cm	1.0				0.841	1.50
Total Dissolved Solids	mg/L	10				520	895
Fluoride (F-)	mg/L	0.10				0.49	0.36
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.57	0.45
Dissolved Organic Carbon	mg/L	0.20				7.9	4.5
pH	pH	N/A	6.5-8.5		6.0-9.5	8.20	8.02
Phenols-4AAP	mg/L	0.0010			0.04	<0.0010	<0.0010
Total Phosphorus	mg/L	0.002		0.02[5b]		*0.021*	*0.056*
Total Suspended Solids	mg/L	10			30	<10	12
Dissolved Sulphate (SO4)	mg/L	1				220	230
Alkalinity (Total as CaCO3)	mg/L	1.0				120	260
Dissolved Chloride (Cl)	mg/L	1				50	180
Nitrite (N)	mg/L	0.010				<0.010	0.041
Nitrate (N)	mg/L	0.10				<0.10	1.98
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50
Metals							
Total Arsenic (As)	ug/L	1	100	5		<1.0	<1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10	<0.10
Total Calcium (Ca)	ug/L	200				53000	130000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0	<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0	1.9
Total Iron (Fe)	ug/L	100	300			160	420
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50	<0.50
Total Magnesium (Mg)	ug/L	50				24000	41000
Total Manganese (Mn)	ug/L	2				47	95
Total Nickel (Ni)	ug/L	1	25			1.3	1.5
Total Potassium (K)	ug/L	200				8800	12000
Total Sodium (Na)	ug/L	100				71000	120000
Total Zinc (Zn)	ug/L	5	30	20		<5.0	<5.0

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

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

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

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

5a. Aluminum (Interim):

- At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples.
- At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs.
- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

5b. Phosphorus (Interim):

- Current scientific evidence is insufficient to develop a firm Objective at this time.
- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:

(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;
(b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value;
(c) Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.

5c. Beryllium :	If Hardness <75 mg/L (CaCO3), use 11 ug/L If Hardness >75 mg/L (CaCO3), use 1100 ug/L
5d. Cadmium: (Interim)	If Hardness 0-100 mg/L (CaCO3), then use 0.1 ug/L If Hardness >100 mg/L (CaCO3), then use 0.5 ug/L
5e. Chromium :	1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)
5f. Copper: (Interim)	If Hardness as CaCO3 (mg/L) is 0 - 20, then use 1 ug/L If Hardness as CaCO3 (mg/L) is >20, then use 5 ug/L
5g. Lead :	If Alkalinity as CaCO3 (mg/L) is < 20, use 5 ug/L If Alkalinity as CaCO3 (mg/L) is 20 to 40, use 10 ug/L If Alkalinity as CaCO3 (mg/L) is 40 to 80, use 20 ug/L If Alkalinity as CaCO3 (mg/L) is > 80, use 25 ug/L
5h. Lead: (Interim)	If Hardness as CaCO3 (mg/L) is < 30, then use 1 ug/L If Hardness as CaCO3 (mg/L) is 30 to 80, then use 3 ug/L If Hardness as CaCO3 (mg/L) is > 80, then use 5 ug/L

Table 5: Condition 7(3) SW2 Water Quality Results

	Unit	Reportable Detection Limit (RDL)	PWQO [1]	Interim PWQO [2]	PTTW Effluent Limits	McCarthy Quarry	
Sample ID						**SW2**	**SW2**
Date						**30-May-18**	**30-Oct-18**
Field Measured Parameters							
Conductivity	mS/cm					636	1589
pH	pH	n/a	6.5-8.5		6.0-9.5	7.57	8.30
Temperature	°C	n/a				21.7	8.3
Calculated Parameters							
Anion Sum	me/L	N/A				6.31	6.31
Cation Sum	me/L	N/A				6.52	6.52
Hardness (CaCO3)	mg/L	1.0				340	580
Inorganics							
Total Ammonia-N	mg/L	0.050				0.095	0.057
Conductivity	umho/cm	1.0				0.683	1.95
Total Dissolved Solids	mg/L	10				425	1300
Fluoride (F-)	mg/L	0.10				<0.10	0.49
Total Kjeldahl Nitrogen (TKN)	mg/L	0.10				0.63	0.33
Dissolved Organic Carbon	mg/L	0.20				20	8
pH	pH	N/A	6.5-8.5		6.0-9.5	8.11	7.71
Phenols-4AAP	mg/L	0.0010			0.04	<0.0010	0.0015
Total Phosphorus	mg/L	0.002		0.02[5b]		<0.10	*0.027*
Total Suspended Solids	mg/L	10			30	<10	<10
Dissolved Sulphate (SO4)	mg/L	1				20	360
Alkalinity (Total as CaCO3)	mg/L	1.0				330	210
Dissolved Chloride (Cl)	mg/L	1				21	300
Nitrite (N)	mg/L	0.010				<0.010	0.022
Nitrate (N)	mg/L	0.10				<0.10	0.20
Petroleum Hydrocarbons							
Total Oil & Grease	mg/L	0.50	Note 3		30	<0.50	<0.50
Metals							
Total Arsenic (As)	ug/L	1	100	5		1.0	1.0
Total Cadmium (Cd)	ug/L	0.1	0.2	0.1-0.5[5d]		<0.10	<0.10
Total Calcium (Ca)	ug/L	200				120000	150000
Total Chromium (Cr)	ug/L	5	1-89[5e]			<5.0	<5.0
Total Copper (Cu)	ug/L	1	5	1-5[5f]		<1.0	<1.0
Total Iron (Fe)	ug/L	100	300			370	<100
Total Lead (Pb)	ug/L	0.5	5-25[5g]	1-5[5h]		<0.50	<0.50
Total Magnesium (Mg)	ug/L	50				7100	40000
Total Manganese (Mn)	ug/L	2				150	22
Total Nickel (Ni)	ug/L	1	25			1.2	<1.0
Total Potassium (K)	ug/L	200				4200	16000
Total Sodium (Na)	ug/L	100				17000	180000
Total Zinc (Zn)	ug/L	5	30	20		<5.0	5.2

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

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

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

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

5a. Aluminum (Interim):

- At pH 4.5 to 5.5 the Interim PWQO is 15 ug/L based on inorganic monomeric aluminum measured in clay-free samples.
- At pH >5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs.
- At pH >6.5 to 9.0, the Interim PWQO is 75 ug/L based on total aluminum measured in clay-free samples.
- If natural background aluminum concentrations in water bodies unaffected by manmade inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level.

5b. Phosphorus (Interim):

- Current scientific evidence is insufficient to develop a firm Objective at this time.
- Accordingly, the following phosphorus concentrations should be considered as general guidelines which should be supplemented by site-specific studies:

(a) To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L;

(b) A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value;

(c) Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.

5c. Beryllium :	If Hardness <75 mg/L (CaCO3), use 11 ug/L If Hardness >75 mg/L (CaCO3), use 1100 ug/L
5d. Cadmium: (Interim)	If Hardness 0-100 mg/L (CaCO3), then use 0.1 ug/L If Hardness >100 mg/L (CaCO3), then use 0.5 ug/L
5e. Chromium :	1 ug/L for hexavalent chromium (Cr VI) 8.9 ug/L for trivalent chromium (Cr III)
5f. Copper: (Interim)	If Hardness as CaCO3 (mg/L) is 0 - 20, then use 1 ug/L If Hardness as CaCO3 (mg/L) is >20, then use 5 ug/L
5g. Lead :	If Alkalinity as CaCO3 (mg/L) is < 20, use 5 ug/L If Alkalinity as CaCO3 (mg/L) is 20 to 40, use 10 ug/L If Alkalinity as CaCO3 (mg/L) is 40 to 80, use 20 ug/L If Alkalinity as CaCO3 (mg/L) is > 80, use 25 ug/L
5h. Lead: (Interim)	If Hardness as CaCO3 (mg/L) is < 30, then use 1 ug/L If Hardness as CaCO3 (mg/L) is 30 to 80, then use 3 ug/L If Hardness as CaCO3 (mg/L) is > 80, then use 5 ug/L

Table 6: Lethality Monitoring at McCarthy Pond

	Unit	Mortality Limit	McCarthy Quarry							
Sample ID			**Pond**							
Date			**30-Nov-17**	**13-Dec-17**	**28-Jan-18**	**22-Feb-18**	**29-Mar-18**	**30-Apr-18**	**30-May-18**	**29-Aug-18**
Rainbow Trout	% Mortality Rate*	<50%	0	0	0	0	0	0	0	0
Daphnia Magna	% Mortality Rate*	<50%	0	0	0	0	0	0	0	0

Notes

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

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
1-Nov-17	10AM	12PM	7200	120	252,000	35	2,100
2-Nov-17	6:30AM	11AM	16200	270	567,000	35	2,100
3-Nov-17	8:15AM	10AM	6300	105	220,500	35	2,100
4-Nov-17	NO PUMP		0	0	-	-	-
5-Nov-17	NO PUMP		0	0	-	-	-
6-Nov-17	NO PUMP		0	0	-	-	-
7-Nov-17	NO PUMP		0	0	-	-	-
8-Nov-17	NO PUMP		0	0	-	-	-
9-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
10-Nov-17	7:30AM	12PM	16200	270	567,000	35	2,100
11-Nov-17	6:30AM	12:30PM	21600	360	756,000	35	2,100
12-Nov-17	NO PUMP		0	0	-	-	-
13-Nov-17	NO PUMP		0	0	-	-	-
14-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
15-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
16-Nov-17	NO PUMP		0	0	-	-	-
17-Nov-17	6:30AM	12PM	19800	330	693,000	35	2,100
18-Nov-17	NO PUMP		0	0	-	-	-
19-Nov-17	NO PUMP		0	0	-	-	-
20-Nov-17	NO PUMP		0	0	-	-	-
21-Nov-17	NO PUMP		0	0	-	-	-
22-Nov-17	NO PUMP		0	0	-	-	-
23-Nov-17	NO PUMP		0	0	-	-	-
24-Nov-17	NO PUMP		0	0	-	-	-
25-Nov-17	6:30AM	1:30PM	25200	420	882,000	35	2,100
26-Nov-17	NO PUMP		0	0	-	-	-
27-Nov-17	NO PUMP		0	0	-	-	-
28-Nov-17	10AM	6PM	28800	480	1,008,000	35	2,100
29-Nov-17	6:30AM	12:30PM	21600	360	756,000	35	2,100
30-Nov-17	6:30AM	4PM	34200	570	1,197,000	35	2,100
1-Dec-17	NO PUMP		0	0	-	-	-
2-Dec-17	NO PUMP		0	0	-	-	-
3-Dec-17	NO PUMP		0	0	-	-	-
4-Dec-17	7AM	4PM	32400	540	1,134,000	35	2,100
5-Dec-17	7AM	4PM	32400	540	1,134,000	35	2,100
6-Dec-17	NO PUMP		0	0	-	-	-
7-Dec-17	NO PUMP		0	0	-	-	-
8-Dec-17	NO PUMP		0	0	-	-	-
9-Dec-17	NO PUMP		0	0	-	-	-
10-Dec-17	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
11-Dec-17	NO PUMP		0	0	-	-	-
12-Dec-17	NO PUMP		0	0	-	-	-
13-Dec-17	NO PUMP		0	0	-	-	-
14-Dec-17	NO PUMP		0	0	-	-	-
15-Dec-17	NO PUMP		0	0	-	-	-
16-Dec-17	NO PUMP		0	0	-	-	-
17-Dec-17	NO PUMP		0	0	-	-	-
18-Dec-17	NO PUMP		0	0	-	-	-
19-Dec-17	NO PUMP		0	0	-	-	-
20-Dec-17	NO PUMP		0	0	-	-	-
21-Dec-17	NO PUMP		0	0	-	-	-
22-Dec-17	NO PUMP		0	0	-	-	-
23-Dec-17	NO PUMP		0	0	-	-	-
24-Dec-17	NO PUMP		0	0	-	-	-
25-Dec-17	NO PUMP		0	0	-	-	-
26-Dec-17	NO PUMP		0	0	-	-	-
27-Dec-17	NO PUMP		0	0	-	-	-
28-Dec-17	NO PUMP		0	0	-	-	-
29-Dec-17	NO PUMP		0	0	-	-	-
30-Dec-17	NO PUMP		0	0	-	-	-
31-Dec-17	NO PUMP		0	0	-	-	-
1-Jan-18	NO PUMP		0	0	-	-	-
2-Jan-18	NO PUMP		0	0	-	-	-
3-Jan-18	NO PUMP		0	0	-	-	-
4-Jan-18	NO PUMP		0	0	-	-	-
5-Jan-18	NO PUMP		0	0	-	-	-
6-Jan-18	NO PUMP		0	0	-	-	-
7-Jan-18	NO PUMP		0	0	-	-	-
8-Jan-18	NO PUMP		0	0	-	-	-
9-Jan-18	NO PUMP		0	0	-	-	-
10-Jan-18	NO PUMP		0	0	-	-	-
11-Jan-18	NO PUMP		0	0	-	-	-
12-Jan-18	NO PUMP		0	0	-	-	-
13-Jan-18	NO PUMP		0	0	-	-	-
14-Jan-18	NO PUMP		0	0	-	-	-
15-Jan-18	NO PUMP		0	0	-	-	-
16-Jan-18	NO PUMP		0	0	-	-	-
17-Jan-18	NO PUMP		0	0	-	-	-
18-Jan-18	NO PUMP		0	0	-	-	-
19-Jan-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
20-Jan-18	NO PUMP		0	0	-	-	-
21-Jan-18	NO PUMP		0	0	-	-	-
22-Jan-18	7AM	5PM	36000	600	1,260,000	35	2,100
23-Jan-18	NO PUMP		0	0	-	-	-
24-Jan-18	7AM	5PM	36000	600	1,260,000	35	2,100
25-Jan-18	NO PUMP		0	0	-	-	-
26-Jan-18	NO PUMP		0	0	-	-	-
27-Jan-18	NO PUMP		0	0	-	-	-
28-Jan-18	NO PUMP		0	0	-	-	-
29-Jan-18	7AM	5PM	36000	600	1,260,000	35	2,100
30-Jan-18	7AM	5PM	36000	600	1,260,000	35	2,100
31-Jan-18	7AM	5PM	36000	600	1,260,000	35	2,100
1-Feb-18	NO PUMP		0	0	-	-	-
2-Feb-18	NO PUMP		0	0	-	-	-
3-Feb-18	NO PUMP		0	0	-	-	-
4-Feb-18	NO PUMP		0	0	-	-	-
5-Feb-18	7AM	5PM	36000	600	1,260,000	35	2,100
6-Feb-18	9AM	5PM	28800	480	1,008,000	35	2,100
7-Feb-18	NO PUMP		0	0	-	-	-
8-Feb-18	NO PUMP		0	0	-	-	-
9-Feb-18	7AM	3PM	28800	480	1,008,000	35	2,100
10-Feb-18	NO PUMP		0	0	-	-	-
11-Feb-18	NO PUMP		0	0	-	-	-
12-Feb-18	NO PUMP		0	0	-	-	-
13-Feb-18	NO PUMP		0	0	-	-	-
14-Feb-18	8AM	5PM	32400	540	1,134,000	35	2,100
15-Feb-18	7AM	5PM	36000	600	1,260,000	35	2,100
16-Feb-18	7AM	3PM	28800	480	1,008,000	35	2,100
17-Feb-18	NO PUMP		0	0	-	-	-
18-Feb-18	NO PUMP		0	0	-	-	-
19-Feb-18	NO PUMP		0	0	-	-	-
20-Feb-18	7AM	5PM	36000	600	1,260,000	35	2,100
21-Feb-18	NO PUMP		0	0	-	-	-
22-Feb-18	7AM	5PM	36000	600	1,260,000	35	2,100
23-Feb-18	NO PUMP		0	0	-	-	-
24-Feb-18	NO PUMP		0	0	-	-	-
25-Feb-18	NO PUMP		0	0	-	-	-
26-Feb-18	NO PUMP		0	0	-	-	-
27-Feb-18	NO PUMP		0	0	-	-	-
28-Feb-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
1-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
2-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
3-Mar-18	NO PUMP		0	0	-	-	-
4-Mar-18	NO PUMP		0	0	-	-	-
5-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
6-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
7-Mar-18	NO PUMP		0	0	-	-	-
8-Mar-18	8AM	5PM	32400	540	1,134,000	35	2,100
9-Mar-18	7AM	3PM	28800	480	1,008,000	35	2,100
10-Mar-18	NO PUMP		0	0	-	-	-
11-Mar-18	NO PUMP		0	0	-	-	-
12-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
13-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
14-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
15-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
16-Mar-18	7AM	3PM	28800	480	1,008,000	35	2,100
17-Mar-18	NO PUMP		0	0	-	-	-
18-Mar-18	NO PUMP		0	0	-	-	-
19-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
20-Mar-18	NO PUMP		0	0	-	-	-
21-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
22-Mar-18	NO PUMP		0	0	-	-	-
23-Mar-18	NO PUMP		0	0	-	-	-
24-Mar-18	NO PUMP		0	0	-	-	-
25-Mar-18	NO PUMP		0	0	-	-	-
26-Mar-18	NO PUMP		0	0	-	-	-
27-Mar-18	NO PUMP		0	0	-	-	-
28-Mar-18	NO PUMP		0	0	-	-	-
29-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
30-Mar-18	7AM	5PM	36000	600	1,260,000	35	2,100
31-Mar-18	NO PUMP		0	0	-	-	-
1-Apr-18	NO PUMP		0	0	-	-	-
2-Apr-18	NO PUMP		0	0	-	-	-
3-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
4-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
5-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
6-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
7-Apr-18	NO PUMP		0	0	-	-	-
8-Apr-18	NO PUMP		0	0	-	-	-
9-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
10-Apr-18	NO PUMP		0	0	-	-	-
11-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
12-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
13-Apr-18	7AM	3PM	28800	480	1,008,000	35	2,100
14-Apr-18	NO PUMP		0	0	-	-	-
15-Apr-18	NO PUMP		0	0	-	-	-
16-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
17-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
18-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
19-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
20-Apr-18	7AM	3PM	28800	480	1,008,000	35	2,100
21-Apr-18				0	-	-	-
22-Apr-18				0	-	-	-
23-Apr-18				0	-	-	-
24-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
25-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
26-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
27-Apr-18	7AM	4PM	32400	540	1,134,000	35	2,100
28-Apr-18				0	-	-	-
29-Apr-18				0	-	-	-
30-Apr-18	7AM	5PM	36000	600	1,260,000	35	2,100
1-May-18	NO PUMP		0	0	-	-	-
2-May-18	NO PUMP		0	0	-	-	-
3-May-18	NO PUMP		0	0	-	-	-
4-May-18	NO PUMP		0	0	-	-	-
5-May-18	NO PUMP		0	0	-	-	-
6-May-18	NO PUMP		0	0	-	-	-
7-May-18	NO PUMP		0	0	-	-	-
8-May-18	NO PUMP		0	0	-	-	-
9-May-18	NO PUMP		0	0	-	-	-
10-May-18	NO PUMP		0	0	-	-	-
11-May-18	NO PUMP		0	0	-	-	-
12-May-18	NO PUMP		0	0	-	-	-
13-May-18	NO PUMP		0	0	-	-	-
14-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
15-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
16-May-18	7AM	12PM	18000	300	630,000	35	2,100
17-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
18-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
19-May-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
20-May-18	NO PUMP		0	0	-	-	-
21-May-18	NO PUMP		0	0	-	-	-
22-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
23-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
24-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
25-May-18	NO PUMP		0	0	-	-	-
26-May-18	7AM	12PM	18000	300	630,000	35	2,100
27-May-18	NO PUMP		0	0	-	-	-
28-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
29-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
30-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
31-May-18	7AM	5PM	36000	600	1,260,000	35	2,100
1-Jun-18	7AM	4PM	32400	540	1,134,000	35	2,100
2-Jun-18	NO PUMP		0	0	-	-	-
3-Jun-18	NO PUMP		0	0	-	-	-
4-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
5-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
6-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
7-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
8-Jun-18	7AM	4PM	32400	540	1,134,000	35	2,100
9-Jun-18	NO PUMP		0	0	-	-	-
10-Jun-18	NO PUMP		0	0	-	-	-
11-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
12-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
13-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
14-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
15-Jun-18	7AM	4PM	32400	540	1,134,000	35	2,100
16-Jun-18	NO PUMP		0	0	-	-	-
17-Jun-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
18-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
19-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
20-Jun-18	7AM	4PM	32400	540	1,134,000	35	2,100
21-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
22-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
23-Jun-18	NO PUMP		0	0	-	-	-
24-Jun-18	NO PUMP		0	0	-	-	-
25-Jun-18	7AM	5PM	36000	600	1,260,000	35	2,100
26-Jun-18	7AM	2PM	25200	420	882,000	35	2,100
27-Jun-18	NO PUMP		0	0	-	-	-
28-Jun-18	NO PUMP		0	0	-	-	-
29-Jun-18	NO PUMP		0	0	-	-	-
30-Jun-18	NO PUMP		0	0	-	-	-
1-Jul-18	NO PUMP		0	0	-	-	-
2-Jul-18	7AM	12PM	18000	300	630,000	35	2,100
3-Jul-18	NO PUMP		0	0	-	-	-
4-Jul-18	NO PUMP		0	0	-	-	-
5-Jul-18	NO PUMP		0	0	-	-	-
6-Jul-18	NO PUMP		0	0	-	-	-
7-Jul-18	NO PUMP		0	0	-	-	-
8-Jul-18	NO PUMP		0	0	-	-	-
9-Jul-18	NO PUMP		0	0	-	-	-
10-Jul-18	NO PUMP		0	0	-	-	-
11-Jul-18	NO PUMP		0	0	-	-	-
12-Jul-18	NO PUMP		0	0	-	-	-
13-Jul-18	NO PUMP		0	0	-	-	-
14-Jul-18	NO PUMP		0	0	-	-	-
15-Jul-18	NO PUMP		0	0	-	-	-
16-Jul-18	NO PUMP		0	0	-	-	-
17-Jul-18	NO PUMP		0	0	-	-	-
18-Jul-18	NO PUMP		0	0	-	-	-
19-Jul-18	NO PUMP		0	0	-	-	-
20-Jul-18	NO PUMP		0	0	-	-	-
21-Jul-18	NO PUMP		0	0	-	-	-
22-Jul-18	NO PUMP		0	0	-	-	-
23-Jul-18	NO PUMP		0	0	-	-	-
24-Jul-18	NO PUMP		0	0	-	-	-
25-Jul-18	7AM	5PM	36000	600	1,260,000	35	2,100

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
26-Jul-18	7AM	5PM	36000	600	1,260,000	35	2,100
27-Jul-18	7AM	5PM	36000	600	1,260,000	35	2,100
28-Jul-18	NO PUMP		0	0	-	-	-
29-Jul-18	NO PUMP		0	0	-	-	-
30-Jul-18	7AM	5PM	36000	600	1,260,000	35	2,100
31-Jul-18	7AM	5PM	36000	600	1,260,000	35	2,100
1-Aug-18	NO PUMP		0	0	-	-	-
2-Aug-18	NO PUMP		0	0	-	-	-
3-Aug-18	NO PUMP		0	0	-	-	-
4-Aug-18	NO PUMP		0	0	-	-	-
5-Aug-18	NO PUMP		0	0	-	-	-
6-Aug-18	NO PUMP		0	0	-	-	-
7-Aug-18	NO PUMP		0	0	-	-	-
8-Aug-18	9AM	5PM	28800	480	1,008,000	35	2,100
9-Aug-18	NO PUMP		0	0	-	-	-
10-Aug-18	NO PUMP		0	0	-	-	-
11-Aug-18	NO PUMP		0	0	-	-	-
12-Aug-18	NO PUMP		0	0	-	-	-
13-Aug-18	8AM	4PM	28800	480	1,008,000	35	2,100
14-Aug-18	NO PUMP		0	0	-	-	-
15-Aug-18	NO PUMP		0	0	-	-	-
16-Aug-18	NO PUMP		0	0	-	-	-
17-Aug-18	6AM	4PM	36000	600	1,260,000	35	2,100
18-Aug-18	NO PUMP		0	0	-	-	-
19-Aug-18	NO PUMP		0	0	-	-	-
20-Aug-18	NO PUMP		0	0	-	-	-
21-Aug-18	NO PUMP		0	0	-	-	-
22-Aug-18	NO PUMP		0	0	-	-	-
23-Aug-18	NO PUMP		0	0	-	-	-
24-Aug-18	NO PUMP		0	0	-	-	-
25-Aug-18	NO PUMP		0	0	-	-	-
26-Aug-18	NO PUMP		0	0	-	-	-
27-Aug-18	NO PUMP		0	0	-	-	-
28-Aug-18	NO PUMP		0	0	-	-	-
29-Aug-18	NO PUMP		0	0	-	-	-
30-Aug-18	7AM	4PM	32400	540	1,134,000	35	2,100
31-Aug-18	NO PUMP		0	0	-	-	-
1-Sep-18	NO PUMP		0	0	-	-	-
2-Sep-18	NO PUMP		0	0	-	-	-
3-Sep-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
4-Sep-18	NO PUMP		0	0	-	-	-
5-Sep-18	NO PUMP		0	0	-	-	-
6-Sep-18	NO PUMP		0	0	-	-	-
7-Sep-18	7AM	4PM	32400	540	1,134,000	35	2,100
8-Sep-18	NO PUMP		0	0	-	-	-
9-Sep-18	NO PUMP		0	0	-	-	-
10-Sep-18	NO PUMP		0	0	-	-	-
11-Sep-18	NO PUMP		0	0	-	-	-
12-Sep-18	NO PUMP		0	0	-	-	-
13-Sep-18	NO PUMP		0	0	-	-	-
14-Sep-18	7AM	4PM	32400	540	1,134,000	35	2,100
15-Sep-18	NO PUMP		0	0	-	-	-
16-Sep-18	NO PUMP		0	0	-	-	-
17-Sep-18	NO PUMP		0	0	-	-	-
18-Sep-18	NO PUMP		0	0	-	-	-
19-Sep-18	NO PUMP		0	0	-	-	-
20-Sep-18	NO PUMP		0	0	-	-	-
21-Sep-18	NO PUMP		0	0	-	-	-
22-Sep-18	NO PUMP		0	0	-	-	-
23-Sep-18	NO PUMP		0	0	-	-	-
24-Sep-18	8AM	3PM	25200	420	882,000	35	2,100
25-Sep-18	NO PUMP		0	0	-	-	-
26-Sep-18	7:30AM	5:30PM	36000	600	1,260,000	35	2,100
27-Sep-18	NO PUMP		0	0	-	-	-
28-Sep-18	NO PUMP		0	0	-	-	-
29-Sep-18	NO PUMP		0	0	-	-	-
30-Sep-18	NO PUMP		0	0	-	-	-
1-Oct-18	NO PUMP		0	0	-	-	-
2-Oct-18	NO PUMP		0	0	-	-	-
3-Oct-18	NO PUMP		0	0	-	-	-
4-Oct-18	NO PUMP		0	0	-	-	-
5-Oct-18	NO PUMP		0	0	-	-	-
6-Oct-18	NO PUMP		0	0	-	-	-
7-Oct-18	NO PUMP		0	0	-	-	-
8-Oct-18	NO PUMP		0	0	-	-	-
9-Oct-18	NO PUMP		0	0	-	-	-
10-Oct-18	NO PUMP		0	0	-	-	-
11-Oct-18	NO PUMP		0	0	-	-	-
12-Oct-18	NO PUMP		0	0	-	-	-
13-Oct-18	NO PUMP		0	0	-	-	-

Table 7: Measured Water Volume and Rate of Discharge from Quarry Sump

Date	Start	Stop	Total Sec.	Total Min.	Total Litres	Rate of Taking (L/sec)	Rate of Taking (L/min)
ECA Permitted Rate					**6,550,000**	**76**	**4,545**
14-Oct-18	NO PUMP		0	0	-	-	-
15-Oct-18	NO PUMP		0	0	-	-	-
16-Oct-18	6AM	6PM	43200	720	1,512,000	35	2,100
17-Oct-18	6AM	6PM	43200	720	1,512,000	35	2,100
18-Oct-18	NO PUMP		0	0	-	-	-
19-Oct-18	7AM	5PM	36000	600	1,260,000	35	2,100
20-Oct-18	NO PUMP		0	0	-	-	-
21-Oct-18	NO PUMP		0	0	-	-	-
22-Oct-18	NO PUMP		0	0	-	-	-
23-Oct-18	7AM	5PM	36000	600	1,260,000	35	2,100
24-Oct-18	NO PUMP		0	0	-	-	-
25-Oct-18	7AM	5PM	36000	600	1,260,000	35	2,100
26-Oct-18	7AM	5PM	36000	600	1,260,000	35	2,100
27-Oct-18	NO PUMP		0	0	-	-	-
28-Oct-18	NO PUMP		0	0	-	-	-
29-Oct-18	NO PUMP		0	0	-	-	-
30-Oct-18	7AM	5PM	36000	600	1,260,000	35	2,100
31-Oct-18	NO PUMP		0	0	-	-	-

APPENDIX A

Environmental Compliance Approval No. 4731-987KM8

- AKossi
- GQ.

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 4731-987KM8
Issue Date: October 15, 2013

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

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

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

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

- one (1) sump, measuring 20 metres long, 10 metres wide and 3 metres deep, located at the base of the quarry floor, equipped with two (2) submersible pumps each rated at 38 litres per second with a suction intake approximately one (1) metre above the bottom of the sump, discharging to a settling pond via a 203 millimetre diameter pipeline;

- one (1) horse-shoe shaped settling pond with an approximate volume of 14,000 cubic metres (at elevation 248.2 metres), with a Hickenbottom control structure equipped with a 150 millimetre diameter orifice plate, discharging to the roadside ditch along Concession Road 1 with ultimate discharge to the Talbot River via a private ditch;

- all other controls, electrical equipment, instrumentation, piping, pumps, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

TERMS AND CONDITIONS

1. GENERAL CONDITION

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

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

2. CHANGE OF OWNER

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

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

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

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

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

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

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

3. CHANGES IN PROCESSES OR PROCESS MATERIALS

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

4. OPERATIONS MANUAL

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

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

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

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

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

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

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

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

5. EFFLUENT LIMITS

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

Table 1 - Effluent Limits

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

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

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

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

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

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

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

6. EFFLUENT - VISUAL OBSERVATIONS

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

7. EFFLUENT MONITORING AND RECORDING

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

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

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

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

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

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

(a) Outfall of settling pond approximately 150 metres north of Concession 1(i.e. end of pipe discharge);

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

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

Table 3 - Effluent and Surface Water Monitoring	
Frequency	Weekly
Sample Type	Grab
Parameters	Total Suspended Solids, Copper, Lead, Nickel, Zinc, Arsenic, Oil and Grease, Phenolics (4AAP), Hardness (as CaCO3), Alkalinity(as CaCO3), Conductivity, pH, Fluoride, Chloride, Nitrate (N), Nitrite (N), Sulphate, Calcium, Magnesium, Sodium, Potassium, Ammonia (N), Dissolved Organic Carbon, Iron, Total Kjeldahl Nitrogen, Phosphorus (Total), Cadmium, Chromium, Manganese, Anion (Sum), Cation (Sum) and Total Dissolved Solids

(4) There shall be at least **four days** between successive sampling.

(5) The methods and protocols for sampling, analysis, and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (August 1994), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions;

(b) the publication "Standard Methods for the Examination of Water and Wastewater" (17th edition) as amended from time to time by more recently published editions; and,

(c) in respect of any parameters not mentioned in (a) and (b), the written approval of the *District Manager* , shall be obtained prior to sampling.

(6) The measurement frequencies specified in subsection (2) in respect of any parameter are minimum requirements which may, **after 48 months** of monitoring in accordance with this Condition, be modified by the *District Manager* in writing from time to time.

(7) The measurement frequencies specified in subsection (3) in respect of any parameter shall be changed to semi-annually after one year of quarry operation.

(8) A continuous flow measuring device shall be installed and maintained to measure the flowrate of the effluent from the sewage works, with an accuracy to within plus or minus 15 per cent of the actual flowrate for the entire design range of the flow measuring device and the *Owner* shall measure, record and calculate the flowrate for each effluent stream on each day of sampling.

(9) The *Owner* shall retain for a minimum of **three (3) years** from the date of their creation, all records

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

8. LETHALITY MONITORING

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

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

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

9. RECEIVER INSPECTION

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

10. REPORTING

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

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

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

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

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

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5, including an overview of the success and adequacy of the sewage works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the sewage works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period; and

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment.

Schedule A

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Approval of Industrial Sewage Works submitted by Thomas S. McCarthy dated July 21, 2001 and revised January 25, 2002;

2. McCarthy Property - Certificate of Approval Application prepared by Dixon Hydrogeology Limited dated July 2001;

3. Revised Permit to Take Water - McCarthy Property prepared by Dixon Hydrogeology Limited dated April 11, 2002;

4. Letter and attachments dated January 25, 2002 from John Easton of Dixon Hydrogeology Limited to Mohamed Dhalla of the Ministry of the Environment;

5. Letter and attachments dated April 1, 2002 from Dave Hulme of Dave T. Hulme Enterprises Inc. to Stefanos Habtom of the Ministry of the Environment;

6. Letter dated April 10, 2002 from John Easton of Dixon Hydrogeology Limited to Stefanos Habtom of the Ministry of the Environment;

7. Environmental Review Amended Tribunal Decision: 02-214/02-217 and 03-188/03-189, dated May 25, 2006 - Trent Talbot River Property Owners Association, Marchand Lamarre and Jodi McIntosh v. Director, Ministry of the Environment; and

8. Notification of Change of Address/Ownership dated June 29, 2012, MOE Reference Number 3620-8VQPTZ acknowledging change in company address/ownership from Thomas S. McCarty, Rural Route No.1 Brechin, Ontario, L0K 1B0 to QBJR Aggregates Inc., 949 Wilson Ave., Toronto, Ontario, M3K 1G.

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 15th day of October, 2013

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

APPENDIX B

Permit To Take Water No. 7818-9QJNL4

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

PERMIT TO TAKE WATER

Ground Water
NUMBER 7818-9QJNL4

Pursuant to Section 34 of the Ontario Water Resources Act, R.S.O. 1990 this Permit To Take Water is hereby issued to:

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

For the water taking from: Quarry Sump, McCarthy Quarry

Located at: Lot 1, Concession 1, Geographic Township of Mara
Ramara, County of Simcoe

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

(a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.

(b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.

(c) "Ministry" means Ontario Ministry of the Environment and Climate Change.

(d) "District Office" means the Barrie District Office.

(e) "Permit" means this Permit to Take Water No. 7818-9QJNL4 including its Schedules, if any, issued in accordance with Section 34 of the OWRA.

(f) "Permit Holder" means QBJR Aggregates Inc..

(g) "OWRA " means the *Ontario Water Resources Act,* R.S.O. 1990, c. O. 40, as amended.

You are hereby notified that this Permit is issued subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. Compliance with Permit

1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated October 7, 2014 and signed by Jenny Coco, and all Schedules included in this Permit.

1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.

1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.

1.4 This Permit is not transferable to another person.

1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.

1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.

1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act* , R.S.O. 1990, the *Pesticides Act* , R.S.O. 1990, or the *Safe Drinking Water Act,* S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act* , and the *Environmental Protection Act* , and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

(a) an approval, waiver or justification by the Ministry of any act or omission of any person that contravenes this Permit or other legal requirement; or

(b) acceptance by the Ministry of the information's completeness or accuracy.

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

The requirements of this Permit are severable. If any requirements of this Permit, or the application of any requirements of this Permit to any circumstance, is held invalid or unenforceable, the application of such requirements to other circumstances and the remainder of this Permit shall not be affected thereby.

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 **Expiry**

This Permit expires on **December 31, 2019**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Quarry Sump	Pond Connected	Pits and Quarries	Dewatering	4,545	24	6,544,800	150	17 650950 4933500
						Total Taking:	6,544,800		

3.3 There is an additional water taking limitation per year for Source 1 described as Quarry Sump within Table A. The maximum taking per year from the Quarry Sump is 196,500,000 litres.

4. Monitoring

4.1 The Permit Holder shall not lower the water in the quarry below an elevation of 232.0 metres above sea level.

4.2 The Permit Holder shall establish and maintain a weather station within 1 km of the McCarthy Quarry property that collects and records, at a minimum, the following climatic data on a daily basis:

a) Precipitation (rain and/or snow); and
b) Temperature (maximum and minimum).

4.3 The Permit Holder shall conduct daily water level monitoring with the use of pressure transducers and data loggers at:

a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
b) The monitoring wells named OW4-1, OW4-2, OW5-1, OW6-1, OW6-2, OW9-1, OW9-2, and Bored Well (shown on Figure 2, in Item 2 of Schedule A of this Permit).
c) The City of Kwartha Lakes monitoring well CKL-1, if granted permission by the property owner .

These pressure transducers and data loggers shall be inspected and downloaded at least every 6 months.

4.4 The Permit Holder shall conduct monthly water level monitoring with the use of a manual water level meter at:

a) The residential well known by the MOE Water Well Record Number 5727662 and identified as well DW3 on Figure 2 in Item 2 of Schedule A of this Permit, if granted permission by the property owner.
b) The residential wells named DW1, DW2, and DW4, if granted permission by the property owner (shown on Figure 2, in Item 2 of Schedule A of this Permit).

c) The monitoring wells named AM1b, AMx, TW1-1, OW4-1, OW4-2, OW5-1, OW5-2, OW5-3, OW6-1, OW6-2, OW6-3, OW7-1, OW7-2, OW7-3, OW8-1, OW8-2, OW8-3, OW9-1, OW9-2, and Bored Well (shown on Figure 2 in Item 2 of Schedule A of this Permit).

d) The City of Kwartha Lakes monitoring wells CKL-1 and CKL-2, if granted permission by the property owner .

The Permit Holder may suspend monthly water level monitoring under Condition 4.4 for the months of January and/or February if no water is taken from the quarry on those months.

4.5 The Permit Holder shall, if granted permission by the property owner, measure and record static water levels in the residential wells named DW5, DW6, DW7, and DW8, as shown on Figure 2 in Item 2 of Schedule A of this Permit, at least once in every two (2) month period during which water is taken from the quarry. The Permit Holder may suspend monthly water level monitoring under Condition 4.5 for the months of January and/or February if no water is taken from the quarry on those months.

4.6 The Permit Holder shall, if granted permission by the property owner, on a semi-annual basis collect raw water samples from the residential wells named DW1, DW2, and the well identified in condition 4.3(a). Each sample shall be tested, at a minimum, for the parameters listed in Table 1 below:

Table 1: Water Quality Parameters for Residential Wells

pH	Sulphate	DOC	Copper
Alkalinity (CaCO3)	Magnesium	Colour	Iron
Bicarbonate	Calcium	Turbidity	Lead
Conductivity	Sodium	Aluminium	Manganese
Fluoride	Potassium	Arsenic	Selenium
Chloride	Ammonia (N)	Barium	Zinc
Nitrate	Phosphate	Boron	Hardness (CaCO3)
Nitrite	Phosphorus	Cadmium	TDS (iron sum calc.)
Chromium	Anion Sum	Ion Ratio	Langelier Index
Tannins	Cation Sum	% Difference	

The Permit Holder shall immediately report to the respective well owner, the Director, and District Office any sampling result that exceeds the Ontario Drinking Water Quality Standards as prescribed by O.Reg. 169/03, as amended.

4.7 The Permit Holder shall on a semi-annual basis conduct the groundwater quality monitoring from the on-site groundwater monitors listed in Table 2. Each sample shall be tested, at a minimum, for the parameters listed in Table 3.

Table 2: On-Site Groundwater Monitors for Water Quality Sampling

AM1b	OW4-I	OW5-III	OW8-I
AMx	OW4-II	OW6-II	OW8-II
TW1-1	OW5-I	OW7-I	OW9-I
Bored Well	OW5-II	OW7-II	OW9-II

Table 3: Water Quality Parameters for On-Site Groundwater Monitors

pH	Magnesium	Sulphate	Conductivity
Alkalinity	Calcium	Nitrate	DOC
Bicarbonate	Sodium	Nitrite	Colour
Fluoride	Potassium	Phosphate	TDS
Chloride	Ammonia	Phosphorus	Hardness

4.8 Monitoring well AMx is within the quarry extraction area and will be mined out as the quarry face advances to the south. The Permit Holder shall continue to monitor AMx as listed in Conditions 4.4 and 4.7 until such monitoring is either deemed unsafe or the monitoring is not possible due to damage to AMx. Once monitoring of AMx is not possible under Conditions 4.4 and/or 4.7, then a replacement monitoring well must be established along the western property boundary between the quarry face and OW4. This replacement well shall be monitored as per Conditions 4.4 and 4.7 instead of AMx.

4.9 The Permit Holder shall notify the Director, in writing, within 30 days if the groundwater level or groundwater quality monitoring of any well listed under conditions 4.3, 4.4, 4.5, 4.6, and 4.7 is not possible, including being denied access to a private well. In the event of damage or loss of any monitoring well, monitoring devices or related equipment, the Permit Holder shall be allowed 30 calendar days from the date of discovery of the occurrence to repair or replace equipment. If a well is too damaged to be repaired or monitored, or if the well is deemed unsafe to be monitored, then the Director will decide if a replacement well is required and will modify the appropriate monitoring conditions in a written letter to the Permit Holder.

4.10 The Permit Holder shall maintain a record of all water takings. This record shall include the dates and times of water takings, and the total measured or calculated amounts for water pumped per day for each day that water is taken under the authorization of this Permit.

4.11 The Permit Holder shall keep all required records up to date and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request.

4.12 The Permit Holder shall provide to the Director an annual monitoring report no

later than March 1 each year during the life of this Permit. The annual monitoring report shall be prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:

a) The review and assessment of all monitoring data required by this Permit.
b) An up-date of the quarry operations and predicted quarrying and dewatering for the next twelve (12) months.
c) An assessment of the groundwater trends using the on-site on off-site monitoring data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.
d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.
e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.
f) Any groundwater interference complaints.
g) Description of all communication with the public.
h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report.

4.13 The Permit Holder shall make available on a publicly-accessible site on the internet the water quality and quantity data that it is required to monitor and record under this Permit and O.Reg. 387/04, as amended, and a copy of every report that is required to be prepared under this Permit. For greater clarity, the Permit Holder shall not publish any personal information as defined by the *Freedom of Information and Protection of Privacy Act,* R.S.O. 1990, c. F.31, as amended.

4.14 The Permit Holder shall maintain a Public Liaison Committee ("PLC") comprised of not more than seven (7) members that will meet at least once every four (4) months, unless the majority of the PLC decide that more or less frequent meetings are required. The PLC shall be comprised of: two (2) members appointed by the Permit Holder - one of whom shall act as Chairperson; one (1) member from each of the Township and the County, if they wish to have representatives; and three (3) members appointed by the public, if they wish to have representatives, who must be permanent residents within a 3 kilometre radius of the quarry property. The PLC shall serve in an advisory / community liaison role and shall have no powers to direct the Permit Holder or the Ministry.

4.15 Any request for an amendment or renewal of this Permit must be accompanied by a report prepared by an individual with P.Geo. or equivalent qualifications and shall include, at a minimum:

a) The review and assessment of all monitoring data required by this Permit.
b) An up-date of the quarry operations and predicted quarrying and dewatering for the duration of the requested permit.
c) An assessment of the groundwater trends using the on-site on off-site monitoring

data. This analysis should state the actual impact area of quarry dewatering and determine the potential for off-site impacts. If any impacts are predicted then a detailed mitigation plan shall be included within this report.

d) Analysis that includes amount of water pumped, precipitation data, and an estimate of how much groundwater was pumped versus surface water.

e) Figures that include site maps with current quarry depths, groundwater contour maps, impact area of quarry dewatering, groundwater elevation graphs, and geological cross-sections.

f) Any groundwater interference complaints.

g) Description of all communication with the public.

h) Conclusions and recommendations, if any, to improve the monitoring and reporting at the site.

An electronic copy of the data collected must also accompany the report. Any application for renewal of this Permit must be submitted to the Ministry at least ninety (90) days prior to the expiry of this Permit.

4.16 The Permit Holder shall, as directed by the Ministry, participate in a cumulative impact assessment for the Carden Plain Area with other quarry operators who have been issued a permit to take water in this area.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

5.2.1 Where the water supply provided by the well known by MOE Water Well Record Number 5727662 is restored in accordance with Condition 5.2, the Permit Holder shall

restore the supply in a manner satisfactory to the Director, taking into account the residential needs, requirements and preferences of the persons serviced by the well.

5.3 Upon the receipt of a groundwater interference complaint, the Permit Holder shall:

a) Implement the McCarthy Quarry Complaint Resolution Process as described in Item 3 of Schedule A of this Permit.

b) In addition, appropriate notification and actions must be taken as described in conditions 5.1 and 5.2 of this Permit. The provisions of conditions 5.1 and 5.2 shall take precedence over the provisions of condition 5.3(a) if there is a conflict.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act* , Section 100 (4).

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.

2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.

3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, ***Environmental Bill of Rights****, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the Ontario Water Resources Act, as amended provides that the Notice requiring a hearing shall state:*

1. The portions of the Permit or each term or condition in the Permit 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.

In addition to these legal requirements, the Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Permit to Take Water number;
6. The date of the Permit to Take Water;
7. The name of the Director;
8. The municipality within which the works are located;

This notice must be served upon:

The Secretary
Environmental Review Tribunal
655 Bay Street, 15th Floor
Toronto ON
M5G 1E5
Fax: (416) 314-4506
Email:
ERTTribunalsecretary@ontario.ca

AND

The Environmental Commissioner
1075 Bay Street
6th Floor, Suite 605
Toronto, Ontario M5S 2W5

AND

The Director, Section 34,
Ministry of the Environment and Climate Change
8th Floor
5775 Yonge St
Toronto ON M2M 4J1
Fax: (416) 325-6347

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600 ***by fax at (416) 314-4506*** ***by e-mail at www.ert.gov.on.ca***

This instrument is subject to Section 38 of the ***Environmental Bill of Rights*** *that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.*

This Permit cancels and replaces Permit Number 8271-8VQJGU, issued on 2012/07/11.

Dated at Toronto this 30th day of December, 2014.

H. Zhang

Helen Zhang, P.Eng.
Director, Section 34
Ontario Water Resources Act , R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 7818-9QJNL4, dated December 30, 2014.

1. Permit To Take Water Application, signed by Jenny Coco, October 7, 2014.

2. Permit To Take Water Application - Renewal Application for McCarthy Quarry, Township of Ramara. Golder Associates Ltd. October 2014.

3. McCarthy Quarry Complaint Resolution Process, Golder Associates Ltd. November 2014.

4. Further Changes to PTTW No. 8271-8VQJGU. Golder Associates Ltd. November 11, 2014.

APPENDIX C (ON CD)

Water Quality Results

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/09
Report #: R4841466
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7O7483
Received: 2017/11/03, 09:31

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil & Grease	1	N/A	2017/11/07	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/11/07	2017/11/07	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/11/07	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/11/08	CAM SOP-00444	OMOE E3179 m
TPH (Heavy Oil) (1)	1	2017/11/07	2017/11/07	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/11/06	2017/11/08	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-07-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/05/24
Report #: R5169247
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B8396
Received: 2018/05/18, 09:33

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2018/05/24	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/05/24	2018/05/24	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2018/05/22	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/05/23	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2018/05/24	2018/05/24	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2018/05/22	2018/05/23	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-07-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/05/24
Report #: R5169247
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8B8396
Received: 2018/05/18, 09:33

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

Maxxam Job #: B8B8396
Report Date: 2018/05/24

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		GST311		
Sampling Date		2018/05/18		
COC Number		628645-07-01		
	UNITS	**POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	0.90	0.50	5537711
Inorganics				
pH	pH	8.19	N/A	5540023
Phenols-4AAP	mg/L	<0.0010	0.0010	5544420
Total Suspended Solids	mg/L	3	1	5541439
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	0.90	0.50	5545156
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5545159

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

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

Maxxam Job #: B8B8396
Report Date: 2018/05/24

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

GENERAL COMMENTS

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

Package 1	5.3°C

Results relate only to the items tested.

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

Maxxam Job #: B8B8396
Report Date: 2018/05/24

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5540023	GTO	Spiked Blank	pH	2018/05/22		102	%	98 - 103
5540023	GTO	RPD	pH	2018/05/22	0.15		%	N/A
5541439	MJ1	QC Standard	Total Suspended Solids	2018/05/23		100	%	85 - 115
5541439	MJ1	Method Blank	Total Suspended Solids	2018/05/23	<1		mg/L	
5541439	MJ1	RPD	Total Suspended Solids	2018/05/23	5.7		%	25
5544420	ZSK	Matrix Spike	Phenols-4AAP	2018/05/23		96	%	80 - 120
5544420	ZSK	Spiked Blank	Phenols-4AAP	2018/05/23		96	%	80 - 120
5544420	ZSK	Method Blank	Phenols-4AAP	2018/05/23	<0.0010		mg/L	
5544420	ZSK	RPD	Phenols-4AAP	2018/05/23	NC		%	20
5545156	FA	Spiked Blank	Total Oil & Grease	2018/05/24		94	%	85 - 115
5545156	FA	RPD	Total Oil & Grease	2018/05/24	2.9		%	25
5545156	FA	Method Blank	Total Oil & Grease	2018/05/24	<0.50		mg/L	
5545159	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2018/05/24		95	%	85 - 115
5545159	FA	RPD	Total Oil & Grease Mineral/Synthetic	2018/05/24	3.2		%	25
5545159	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2018/05/24	<0.50		mg/L	

N/A = Not Applicable

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

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

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

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

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

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

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Maxxam Job #: B8B8396
Report Date: 2018/05/24

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 641481-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/05/30
Report #: R5184893
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8C4915
Received: 2018/05/25, 11:35

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2018/05/29	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/05/29	2018/05/29	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2018/05/29	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/05/29	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2018/05/29	2018/05/29	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2018/05/28	2018/05/29	CAM SOP-00428	SM 23 2540D m

Remarks:

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 641481-04-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/05/30
Report #: R5184893
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8C4915
Received: 2018/05/25, 11:35

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 #: B8C4915
Report Date: 2018/05/30

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			GUE378		
Sampling Date			2018/05/24 13:32		
COC Number			641481-04-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	5549703
Inorganics					
pH	pH	**6.5:8.5**	8.38	N/A	5552962
Phenols-4AAP	mg/L	**0.001**	0.0010	0.0010	5553922
Total Suspended Solids	mg/L	**-**	3	1	5550961
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	5553105
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	5553112

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B8C4915
Report Date: 2018/05/30

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

GENERAL COMMENTS

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

Package 1	16.7°C

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

Results relate only to the items tested.

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

Maxxam Job #: B8C4915
Report Date: 2018/05/30

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5550961	MJ1	QC Standard	Total Suspended Solids	2018/05/29		98	%	85 - 115
5550961	MJ1	Method Blank	Total Suspended Solids	2018/05/29	<1		mg/L	
5550961	MJ1	RPD	Total Suspended Solids	2018/05/29	12		%	25
5552962	GTO	Spiked Blank	pH	2018/05/29		102	%	98 - 103
5552962	GTO	RPD	pH	2018/05/29	0.12		%	N/A
5553105	MA4	Spiked Blank	Total Oil & Grease	2018/05/29		97	%	85 - 115
5553105	MA4	RPD	Total Oil & Grease	2018/05/29	2.8		%	25
5553105	MA4	Method Blank	Total Oil & Grease	2018/05/29	<0.50		mg/L	
5553112	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2018/05/29		96	%	85 - 115
5553112	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2018/05/29	1.6		%	25
5553112	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2018/05/29	<0.50		mg/L	
5553922	ZSK	Matrix Spike	Phenols-4AAP	2018/05/29		94	%	80 - 120
5553922	ZSK	Spiked Blank	Phenols-4AAP	2018/05/29		96	%	80 - 120
5553922	ZSK	Method Blank	Phenols-4AAP	2018/05/29	<0.0010		mg/L	
5553922	ZSK	RPD	Phenols-4AAP	2018/05/29	NC		%	20

N/A = Not Applicable

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

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

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

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

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Maxxam Job #: B8C4915
Report Date: 2018/05/30

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

VALIDATION SIGNATURE PAGE

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Brad Newman, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 661829-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/07
Report #: R5220975
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D1367
Received: 2018/06/01, 09:26

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2018/06/05	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/06/04	2018/06/04	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2018/06/04	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/06/06	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2018/06/05	2018/06/05	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2018/06/04	2018/06/05	CAM SOP-00428	SM 23 2540D m

Remarks:

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 661829-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/07
Report #: R5220975
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D1367
Received: 2018/06/01, 09:26

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 #: B8D1367
Report Date: 2018/06/07

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			GVQ055		
Sampling Date			2018/05/31 11:56		
COC Number			661829-01-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	0.60	0.50	5559212
Inorganics					
pH	pH	**6.5:8.5**	8.31	N/A	5561584
Phenols-4AAP	mg/L	**0.001**	**0.0011**	0.0010	5566472
Total Suspended Solids	mg/L	**-**	3	1	5562721
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	0.60	0.50	5562512
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	5564462

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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

Maxxam Job #: B8D1367
Report Date: 2018/06/07

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

GENERAL COMMENTS

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

Package 1	17.3°C

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

Results relate only to the items tested.

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

Maxxam Job #: B8D1367
Report Date: 2018/06/07

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5561584	TA1	Spiked Blank	pH	2018/06/04		101	%	98 - 103
5561584	TA1	RPD	pH	2018/06/04	1.2		%	N/A
5562512	AMJ	Spiked Blank	Total Oil & Grease	2018/06/04		99	%	85 - 115
5562512	AMJ	RPD	Total Oil & Grease	2018/06/04	2.0		%	25
5562512	AMJ	Method Blank	Total Oil & Grease	2018/06/04	<0.50		mg/L	
5562721	NNA	QC Standard	Total Suspended Solids	2018/06/05		97	%	85 - 115
5562721	NNA	Method Blank	Total Suspended Solids	2018/06/05	<1		mg/L	
5562721	NNA	RPD	Total Suspended Solids	2018/06/05	0		%	25
5564462	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2018/06/05		96	%	85 - 115
5564462	FA	RPD	Total Oil & Grease Mineral/Synthetic	2018/06/05	4.8		%	25
5564462	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2018/06/05	<0.50		mg/L	
5566472	ZSK	Matrix Spike	Phenols-4AAP	2018/06/06		96	%	80 - 120
5566472	ZSK	Spiked Blank	Phenols-4AAP	2018/06/06		97	%	80 - 120
5566472	ZSK	Method Blank	Phenols-4AAP	2018/06/06	<0.0010		mg/L	
5566472	ZSK	RPD	Phenols-4AAP	2018/06/06	NC		%	20

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Maxxam Job #: B8D1367
Report Date: 2018/06/07

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

VALIDATION SIGNATURE PAGE

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/12
Report #: R5233576
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D8843
Received: 2018/06/08, 08:49

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2018/06/11	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/06/11	2018/06/11	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2018/06/11	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/06/11	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2018/06/11	2018/06/11	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2018/06/09	2018/06/09	CAM SOP-00428	SM 23 2540D m

Remarks:

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* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-02-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/12
Report #: R5233576
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D8843
Received: 2018/06/08, 08:49

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

Maxxam Job #: B8D8843
Report Date: 2018/06/12

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			GXE959		
Sampling Date			2018/06/07 12:34		
COC Number			635365-02-01		
	UNITS	**Criteria**	**POND**	**RDL**	**QC Batch**
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	2.1	0.50	5571232
Inorganics					
pH	pH	**6.5:8.5**	**8.73**	N/A	5572990
Phenols-4AAP	mg/L	**0.001**	<0.0010	0.0010	5574592
Total Suspended Solids	mg/L	**-**	5	1	5573043
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	2.7	0.50	5573524
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	**0.60**	0.50	5573531

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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

Maxxam Job #: B8D8843
Report Date: 2018/06/12

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

GENERAL COMMENTS

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

Package 1	2.7°C

Results relate only to the items tested.

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

Maxxam Job #: B8D8843
Report Date: 2018/06/12

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5572990	SAU	Spiked Blank	pH	2018/06/11		102	%	98 - 103
5572990	SAU	RPD	pH	2018/06/11	0.53		%	N/A
5573043	MKX	QC Standard	Total Suspended Solids	2018/06/09		96	%	85 - 115
5573043	MKX	Method Blank	Total Suspended Solids	2018/06/09	<1		mg/L	
5573043	MKX	RPD	Total Suspended Solids	2018/06/09	3.1		%	25
5573524	FA	Spiked Blank	Total Oil & Grease	2018/06/11		100	%	85 - 115
5573524	FA	RPD	Total Oil & Grease	2018/06/11	6.2		%	25
5573524	FA	Method Blank	Total Oil & Grease	2018/06/11	<0.50		mg/L	
5573531	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2018/06/11		91	%	85 - 115
5573531	FA	RPD	Total Oil & Grease Mineral/Synthetic	2018/06/11	4.8		%	25
5573531	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2018/06/11	<0.50		mg/L	
5574592	ZSK	Matrix Spike	Phenols-4AAP	2018/06/11		96	%	80 - 120
5574592	ZSK	Spiked Blank	Phenols-4AAP	2018/06/11		97	%	80 - 120
5574592	ZSK	Method Blank	Phenols-4AAP	2018/06/11	<0.0010		mg/L	
5574592	ZSK	RPD	Phenols-4AAP	2018/06/11	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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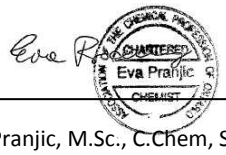
Maxxam Job #: B8D8843
Report Date: 2018/06/12

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

VALIDATION SIGNATURE PAGE

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



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

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/22
Report #: R5261815
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8E6670
Received: 2018/06/15, 10:18

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2018/06/18	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2018/06/18	2018/06/18	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2018/06/19	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2018/06/20	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2018/06/18	2018/06/18	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2018/06/18	2018/06/18	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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

Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-01-01

Attention: Dawn Hoyle/Jamie Bonany

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

Report Date: 2018/06/22
Report #: R5261815
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8E6670
Received: 2018/06/15, 10:18

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 #: B8E6670
Report Date: 2018/06/22

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			GYX220	GYX220		
Sampling Date			2018/06/14 12:22	2018/06/14 12:22		
COC Number			628645-01-01	628645-01-01		
	UNITS	Criteria	POND	POND Lab-Dup	RDL	QC Batch
Calculated Parameters						
Total Animal/Vegetable Oil and Grease	mg/L	-	2.4	N/A	0.50	5583588
Inorganics						
pH	pH	**6.5:8.5**	**8.81**	N/A	N/A	5586216
Phenols-4AAP	mg/L	**0.001**	<0.0010	<0.0010	0.0010	5590108
Total Suspended Solids	mg/L	-	5	N/A	1	5585771
Petroleum Hydrocarbons						
Total Oil & Grease	mg/L	-	3.1	N/A	0.50	5585568
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	**0.70**	N/A	0.50	5585573

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B8E6670
Report Date: 2018/06/22

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

GENERAL COMMENTS

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

Package 1	16.3°C

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

Results relate only to the items tested.

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

Maxxam Job #: B8E6670
Report Date: 2018/06/22

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5585568	FA	Spiked Blank	Total Oil & Grease	2018/06/18		94	%	85 - 115
5585568	FA	RPD	Total Oil & Grease	2018/06/18	4.4		%	25
5585568	FA	Method Blank	Total Oil & Grease	2018/06/18	<0.50		mg/L	
5585573	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2018/06/18		94	%	85 - 115
5585573	FA	RPD	Total Oil & Grease Mineral/Synthetic	2018/06/18	3.2		%	25
5585573	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2018/06/18	<0.50		mg/L	
5585771	MKX	QC Standard	Total Suspended Solids	2018/06/18		95	%	85 - 115
5585771	MKX	Method Blank	Total Suspended Solids	2018/06/18	<1		mg/L	
5585771	MKX	RPD	Total Suspended Solids	2018/06/18	15		%	25
5586216	SAU	Spiked Blank	pH	2018/06/19		102	%	98 - 103
5586216	SAU	RPD	pH	2018/06/19	1.6		%	N/A
5590108	ZSK	Matrix Spike [GYX220-04]	Phenols-4AAP	2018/06/20		95	%	80 - 120
5590108	ZSK	Spiked Blank	Phenols-4AAP	2018/06/20		98	%	80 - 120
5590108	ZSK	Method Blank	Phenols-4AAP	2018/06/20	<0.0010		mg/L	
5590108	ZSK	RPD [GYX220-04]	Phenols-4AAP	2018/06/20	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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Maxxam Job #: B8E6670
Report Date: 2018/06/22

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 665337-01-01

Attention: Jamie Bonany

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

Report Date: 2018/06/07
Report #: R5220189
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D1259
Received: 2018/06/01, 09:20

Sample Matrix: Water
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Alkalinity	3	N/A	2018/06/05	CAM SOP-00448	SM 23 2320 B m
Chloride by Automated Colourimetry	3	N/A	2018/06/05	CAM SOP-00463	EPA 325.2 m
Conductivity	3	N/A	2018/06/05	CAM SOP-00414	SM 23 2510 m
Dissolved Organic Carbon (DOC) (1)	3	N/A	2018/06/05	CAM SOP-00446	SM 23 5310 B m
Fluoride	3	2018/06/02	2018/06/05	CAM SOP-00449	SM 23 4500-F C m
Hardness (calculated as CaCO3)	3	N/A	2018/06/06	CAM SOP 00102/00408/00447	SM 2340 B
Lab Filtered Metals Analysis by ICP	2	2018/06/04	2018/06/06	CAM SOP-00408	EPA 6010D m
Lab Filtered Metals Analysis by ICP	1	2018/06/05	2018/06/06	CAM SOP-00408	EPA 6010D m
Total Metals Analysis by ICPMS	3	N/A	2018/06/06	CAM SOP-00447	EPA 6020B m
Total Ammonia-N	3	N/A	2018/06/06	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	3	N/A	2018/06/05	CAM SOP-00440	SM 23 4500-NO3I/NO2B
Total Oil and Grease	3	2018/06/04	2018/06/04	CAM SOP-00326	EPA1664B m,SM5520A m
pH	3	N/A	2018/06/05	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	3	N/A	2018/06/05	CAM SOP-00444	OMOE E3179 m
Sulphate by Automated Colourimetry	3	N/A	2018/06/04	CAM SOP-00464	EPA 375.4 m
Total Dissolved Solids	3	2018/06/04	2018/06/06	CAM SOP-00428	SM 23 2540C m
Total Kjeldahl Nitrogen in Water	2	2018/06/02	2018/06/06	CAM SOP-00938	OMOE E3516 m
Total Kjeldahl Nitrogen in Water	1	2018/06/02	2018/06/07	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	3	2018/06/05	2018/06/05	CAM SOP-00407	SM 23 4500 P B H m
Total Suspended Solids	3	2018/06/04	2018/06/05	CAM SOP-00428	SM 23 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

Your Project #: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 665337-01-01

Attention: Jamie Bonany

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

Report Date: 2018/06/07
Report #: R5220189
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8D1259
Received: 2018/06/01, 09:20

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

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.

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

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

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.
(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

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

==========

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			GVP562	GVP563		GVP564		
Sampling Date			2018/05/30 01:15	2018/05/30 01:00		2018/05/30 11:30		
COC Number			665337-01-01	665337-01-01		665337-01-01		
	UNITS	Criteria	POND	SW1	RDL	SW2	RDL	QC Batch
Calculated Parameters								
Hardness (CaCO3)	mg/L	-	240	240	1.0	340	1.0	5559633
Inorganics								
Total Ammonia-N	mg/L	-	0.16	0.14	0.050	0.095	0.050	5561665
Conductivity	mS/cm	-	0.848	0.841	0.001	0.683	0.001	5561484
Total Dissolved Solids	mg/L	-	525	520	10	425	10	5562689
Fluoride (F-)	mg/L	-	0.50	0.49	0.10	<0.10	0.10	5561483
Total Kjeldahl Nitrogen (TKN)	mg/L	-	0.60	0.57	0.10	0.63	0.10	5561612
Dissolved Organic Carbon	mg/L	-	7.5	7.9	0.50	20	0.50	5561441
pH	pH	6.5:8.5	8.21	8.20		8.11		5561485
Phenols-4AAP	mg/L	0.001	<0.0010	<0.0010	0.0010	<0.0010	0.0010	5565033
Total Phosphorus	mg/L	0.01	**<0.020 (1)**	**0.021**	0.020	<0.10 (2)	0.10	5564214
Total Suspended Solids	mg/L	-	<10	<10	10	<10	10	5562682
Dissolved Sulphate (SO4)	mg/L	-	230	220	1.0	20	1.0	5561803
Alkalinity (Total as CaCO3)	mg/L	-	110	120	1.0	330	1.0	5561481
Dissolved Chloride (Cl)	mg/L	-	60	50	1.0	21	1.0	5561801
Nitrite (N)	mg/L	-	<0.010	<0.010	0.010	<0.010	0.010	5561682
Nitrate (N)	mg/L	-	<0.10	<0.10	0.10	<0.10	0.10	5561682
Nitrate + Nitrite (N)	mg/L	-	<0.10	<0.10	0.10	<0.10	0.10	5561682
Petroleum Hydrocarbons								
Total Oil & Grease	mg/L	-	<0.50	<0.50	0.50	<0.50	0.50	5562512

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
(1) RDL exceeds criteria
(2) Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.

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

Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			GVP562		GVP563			GVP563		
Sampling Date			2018/05/30 01:15		2018/05/30 01:00			2018/05/30 01:00		
COC Number			665337-01-01		665337-01-01			665337-01-01		
	UNITS	Criteria	POND	QC Batch	SW1	RDL	QC Batch	SW1 Lab-Dup	RDL	QC Batch
Metals										
Dissolved Calcium (Ca)	mg/L	-	53	5562457	54	0.05	5564433	55	0.05	5564433
Dissolved Magnesium (Mg)	mg/L	-	26	5562457	25	0.05	5564433	25	0.05	5564433
Dissolved Potassium (K)	mg/L	-	10	5562457	9	1	5564433	9	1	5564433
Dissolved Sodium (Na)	mg/L	-	78	5562457	74	0.5	5564433	75	0.5	5564433
Total Arsenic (As)	ug/L	100	<1.0	5564615	<1.0	1.0	5564615			
Total Cadmium (Cd)	ug/L	0.2	<0.10	5564615	<0.10	0.10	5564615			
Total Calcium (Ca)	ug/L	-	51000	5564615	53000	200	5564615			
Total Chromium (Cr)	ug/L	-	<5.0	5564615	<5.0	5.0	5564615			
Total Copper (Cu)	ug/L	5	<1.0	5564615	<1.0	1.0	5564615			
Total Iron (Fe)	ug/L	300	<100	5564615	160	100	5564615			
Total Lead (Pb)	ug/L	5	<0.50	5564615	<0.50	0.50	5564615			
Total Magnesium (Mg)	ug/L	-	25000	5564615	24000	50	5564615			
Total Manganese (Mn)	ug/L	-	64	5564615	47	2.0	5564615			
Total Nickel (Ni)	ug/L	25	1.5	5564615	1.3	1.0	5564615			
Total Potassium (K)	ug/L	-	9300	5564615	8800	200	5564615			
Total Sodium (Na)	ug/L	-	74000	5564615	71000	100	5564615			
Total Zinc (Zn)	ug/L	30	<5.0	5564615	<5.0	5.0	5564615			

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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

Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID			GVP564		
Sampling Date			2018/05/30 11:30		
COC Number			665337-01-01		
	UNITS	Criteria	SW2	RDL	QC Batch
Metals					
Dissolved Calcium (Ca)	mg/L	-	120	0.05	5562457
Dissolved Magnesium (Mg)	mg/L	-	7.0	0.05	5562457
Dissolved Potassium (K)	mg/L	-	4	1	5562457
Dissolved Sodium (Na)	mg/L	-	18	0.5	5562457
Total Arsenic (As)	ug/L	100	1.0	1.0	5564615
Total Cadmium (Cd)	ug/L	0.2	<0.10	0.10	5564615
Total Calcium (Ca)	ug/L	-	120000	200	5564615
Total Chromium (Cr)	ug/L	-	<5.0	5.0	5564615
Total Copper (Cu)	ug/L	5	<1.0	1.0	5564615
Total Iron (Fe)	ug/L	300	**370**	100	5564615
Total Lead (Pb)	ug/L	5	<0.50	0.50	5564615
Total Magnesium (Mg)	ug/L	-	7100	50	5564615
Total Manganese (Mn)	ug/L	-	150	2.0	5564615
Total Nickel (Ni)	ug/L	25	1.2	1.0	5564615
Total Potassium (K)	ug/L	-	4200	200	5564615
Total Sodium (Na)	ug/L	-	17000	100	5564615
Total Zinc (Zn)	ug/L	30	<5.0	5.0	5564615

No Fill	No Exceedance
Grey	Exceeds 1 criteria policy/level
Black	Exceeds both criteria/levels

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

TEST SUMMARY

Maxxam ID: GVP562
Sample ID: POND
Matrix: Water

Collected: 2018/05/30
Shipped:
Received: 2018/06/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5561481	N/A	2018/06/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	5561801	N/A	2018/06/05	Deonarine Ramnarine
Conductivity	AT	5561484	N/A	2018/06/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5561441	N/A	2018/06/05	Nimarta Singh
Fluoride	ISE	5561483	2018/06/02	2018/06/05	Surinder Rai
Hardness (calculated as CaCO3)		5559633	N/A	2018/06/06	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5562457	2018/06/04	2018/06/06	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5564615	N/A	2018/06/06	Thao Nguyen
Total Ammonia-N	LACH/NH4	5561665	N/A	2018/06/06	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5561682	N/A	2018/06/05	Chandra Nandlal
Total Oil and Grease	BAL	5562512	2018/06/04	2018/06/04	Amjad Mir
pH	AT	5561485	N/A	2018/06/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5565033	N/A	2018/06/05	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5561803	N/A	2018/06/04	Alina Dobreanu
Total Dissolved Solids	BAL	5562689	2018/06/04	2018/06/06	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	5561612	2018/06/02	2018/06/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5564214	2018/06/05	2018/06/05	Amanpreet Sappal
Total Suspended Solids	BAL	5562682	2018/06/04	2018/06/05	Massarat Jan

Maxxam ID: GVP563
Sample ID: SW1
Matrix: Water

Collected: 2018/05/30
Shipped:
Received: 2018/06/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5561481	N/A	2018/06/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	5561801	N/A	2018/06/05	Deonarine Ramnarine
Conductivity	AT	5561484	N/A	2018/06/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5561441	N/A	2018/06/05	Nimarta Singh
Fluoride	ISE	5561483	2018/06/02	2018/06/05	Surinder Rai
Hardness (calculated as CaCO3)		5559633	N/A	2018/06/06	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5564433	2018/06/05	2018/06/06	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5564615	N/A	2018/06/06	Thao Nguyen
Total Ammonia-N	LACH/NH4	5561665	N/A	2018/06/06	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5561682	N/A	2018/06/05	Chandra Nandlal
Total Oil and Grease	BAL	5562512	2018/06/04	2018/06/04	Amjad Mir
pH	AT	5561485	N/A	2018/06/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5565033	N/A	2018/06/05	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5561803	N/A	2018/06/04	Alina Dobreanu
Total Dissolved Solids	BAL	5562689	2018/06/04	2018/06/06	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	5561612	2018/06/02	2018/06/06	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5564214	2018/06/05	2018/06/05	Amanpreet Sappal
Total Suspended Solids	BAL	5562682	2018/06/04	2018/06/05	Massarat Jan

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

TEST SUMMARY

Maxxam ID: GVP563 Dup
Sample ID: SW1
Matrix: Water

Collected: 2018/05/30
Shipped:
Received: 2018/06/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Lab Filtered Metals Analysis by ICP	ICP	5564433	2018/06/05	2018/06/06	Azita Fazaeli

Maxxam ID: GVP564
Sample ID: SW2
Matrix: Water

Collected: 2018/05/30
Shipped:
Received: 2018/06/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity	AT	5561481	N/A	2018/06/05	Surinder Rai
Chloride by Automated Colourimetry	KONE	5561801	N/A	2018/06/05	Deonarine Ramnarine
Conductivity	AT	5561484	N/A	2018/06/05	Surinder Rai
Dissolved Organic Carbon (DOC)	TOCV/NDIR	5561441	N/A	2018/06/05	Nimarta Singh
Fluoride	ISE	5561483	2018/06/02	2018/06/05	Surinder Rai
Hardness (calculated as CaCO3)		5559633	N/A	2018/06/06	Automated Statchk
Lab Filtered Metals Analysis by ICP	ICP	5562457	2018/06/04	2018/06/06	Azita Fazaeli
Total Metals Analysis by ICPMS	ICP/MS	5564615	N/A	2018/06/06	Thao Nguyen
Total Ammonia-N	LACH/NH4	5561665	N/A	2018/06/06	Parminder Sangha
Nitrate (NO3) and Nitrite (NO2) in Water	LACH	5561682	N/A	2018/06/05	Chandra Nandlal
Total Oil and Grease	BAL	5562512	2018/06/04	2018/06/04	Amjad Mir
pH	AT	5561485	N/A	2018/06/05	Surinder Rai
Phenols (4AAP)	TECH/PHEN	5565033	N/A	2018/06/05	Zahid Soikot
Sulphate by Automated Colourimetry	KONE	5561803	N/A	2018/06/04	Alina Dobreanu
Total Dissolved Solids	BAL	5562689	2018/06/04	2018/06/06	Mandeep Kaur
Total Kjeldahl Nitrogen in Water	SKAL	5561612	2018/06/02	2018/06/07	Rajni Tyagi
Total Phosphorus (Colourimetric)	LACH/P	5564214	2018/06/05	2018/06/05	Amanpreet Sappal
Total Suspended Solids	BAL	5562682	2018/06/04	2018/06/05	Massarat Jan

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

GENERAL COMMENTS

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

Package 1	5.7°C
Package 2	7.7°C
Package 3	4.7°C

Results relate only to the items tested.

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5561441	NS3	Matrix Spike	Dissolved Organic Carbon	2018/06/04		NC	%	80 - 120
5561441	NS3	Spiked Blank	Dissolved Organic Carbon	2018/06/04		99	%	80 - 120
5561441	NS3	Method Blank	Dissolved Organic Carbon	2018/06/04	<0.50		mg/L	
5561441	NS3	RPD	Dissolved Organic Carbon	2018/06/04	0.74		%	20
5561481	SAU	Spiked Blank	Alkalinity (Total as CaCO3)	2018/06/04		98	%	85 - 115
5561481	SAU	Method Blank	Alkalinity (Total as CaCO3)	2018/06/04	<1.0		mg/L	
5561481	SAU	RPD	Alkalinity (Total as CaCO3)	2018/06/04	0.95		%	20
5561483	SAU	Matrix Spike	Fluoride (F-)	2018/06/04		98	%	80 - 120
5561483	SAU	Spiked Blank	Fluoride (F-)	2018/06/04		97	%	80 - 120
5561483	SAU	Method Blank	Fluoride (F-)	2018/06/04	<0.10		mg/L	
5561483	SAU	RPD	Fluoride (F-)	2018/06/04	NC		%	20
5561484	SAU	Spiked Blank	Conductivity	2018/06/04		100	%	85 - 115
5561484	SAU	Method Blank	Conductivity	2018/06/04	<0.001		mS/cm	
5561484	SAU	RPD	Conductivity	2018/06/04	0.59		%	25
5561485	SAU	Spiked Blank	pH	2018/06/04		102	%	98 - 103
5561485	SAU	RPD	pH	2018/06/04	0.083		%	N/A
5561612	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2018/06/06		98	%	80 - 120
5561612	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2018/06/06		96	%	80 - 120
5561612	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2018/06/06		99	%	80 - 120
5561612	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2018/06/06	<0.10		mg/L	
5561612	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2018/06/06	3.8		%	20
5561665	SAN	Matrix Spike	Total Ammonia-N	2018/06/06		87	%	75 - 125
5561665	SAN	Spiked Blank	Total Ammonia-N	2018/06/06		102	%	80 - 120
5561665	SAN	Method Blank	Total Ammonia-N	2018/06/06	<0.050		mg/L	
5561665	SAN	RPD	Total Ammonia-N	2018/06/06	0.60		%	20
5561682	C_N	Matrix Spike	Nitrite (N)	2018/06/05		98	%	80 - 120
			Nitrate (N)	2018/06/05		105	%	80 - 120
5561682	C_N	Spiked Blank	Nitrite (N)	2018/06/05		97	%	80 - 120
			Nitrate (N)	2018/06/05		104	%	80 - 120
5561682	C_N	Method Blank	Nitrite (N)	2018/06/05	<0.010		mg/L	
			Nitrate (N)	2018/06/05	<0.10		mg/L	
5561682	C_N	RPD	Nitrite (N)	2018/06/05	NC		%	20
			Nitrate (N)	2018/06/05	0.90		%	20
5561801	DRM	Matrix Spike	Dissolved Chloride (Cl)	2018/06/05		108	%	80 - 120
5561801	DRM	Spiked Blank	Dissolved Chloride (Cl)	2018/06/05		103	%	80 - 120
5561801	DRM	Method Blank	Dissolved Chloride (Cl)	2018/06/05	<1.0		mg/L	
5561801	DRM	RPD	Dissolved Chloride (Cl)	2018/06/05	1.3		%	20
5561803	ADB	Matrix Spike	Dissolved Sulphate (SO4)	2018/06/04		119	%	75 - 125
5561803	ADB	Spiked Blank	Dissolved Sulphate (SO4)	2018/06/04		100	%	80 - 120
5561803	ADB	Method Blank	Dissolved Sulphate (SO4)	2018/06/04	<1.0		mg/L	
5561803	ADB	RPD	Dissolved Sulphate (SO4)	2018/06/04	1.7		%	20
5562457	AFZ	Matrix Spike	Dissolved Calcium (Ca)	2018/06/06		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/06		NC	%	80 - 120
			Dissolved Potassium (K)	2018/06/06		106	%	80 - 120
			Dissolved Sodium (Na)	2018/06/06		NC	%	80 - 120
5562457	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2018/06/06		101	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/06		100	%	80 - 120
			Dissolved Potassium (K)	2018/06/06		102	%	80 - 120
			Dissolved Sodium (Na)	2018/06/06		101	%	80 - 120
5562457	AFZ	Method Blank	Dissolved Calcium (Ca)	2018/06/06	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2018/06/06	<0.05		mg/L	
			Dissolved Potassium (K)	2018/06/06	<1		mg/L	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sodium (Na)	2018/06/06	<0.5		mg/L	
5562457	AFZ	RPD	Dissolved Calcium (Ca)	2018/06/06	1.3		%	25
			Dissolved Magnesium (Mg)	2018/06/06	1.8		%	25
			Dissolved Potassium (K)	2018/06/06	1.1		%	25
			Dissolved Sodium (Na)	2018/06/06	0.84		%	25
5562512	AMJ	Spiked Blank	Total Oil & Grease	2018/06/04		99	%	85 - 115
5562512	AMJ	RPD	Total Oil & Grease	2018/06/04	2.0		%	25
5562512	AMJ	Method Blank	Total Oil & Grease	2018/06/04	<0.50		mg/L	
5562682	MJ1	QC Standard	Total Suspended Solids	2018/06/05		98	%	85 - 115
5562682	MJ1	Method Blank	Total Suspended Solids	2018/06/05	<10		mg/L	
5562682	MJ1	RPD	Total Suspended Solids	2018/06/05	NC		%	25
5562689	MKX	QC Standard	Total Dissolved Solids	2018/06/06		97	%	90 - 110
5562689	MKX	Method Blank	Total Dissolved Solids	2018/06/06	<10		mg/L	
5562689	MKX	RPD	Total Dissolved Solids	2018/06/06	3.2		%	25
5564214	ASP	Matrix Spike	Total Phosphorus	2018/06/05		97	%	80 - 120
5564214	ASP	QC Standard	Total Phosphorus	2018/06/05		97	%	80 - 120
5564214	ASP	Spiked Blank	Total Phosphorus	2018/06/05		95	%	80 - 120
5564214	ASP	Method Blank	Total Phosphorus	2018/06/05	<0.020		mg/L	
5564214	ASP	RPD	Total Phosphorus	2018/06/05	NC		%	20
5564433	AFZ	Matrix Spike [GVP563-01]	Dissolved Calcium (Ca)	2018/06/06		NC	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/06		NC	%	80 - 120
			Dissolved Potassium (K)	2018/06/06		102	%	80 - 120
			Dissolved Sodium (Na)	2018/06/06		NC	%	80 - 120
5564433	AFZ	Spiked Blank	Dissolved Calcium (Ca)	2018/06/06		100	%	80 - 120
			Dissolved Magnesium (Mg)	2018/06/06		99	%	80 - 120
			Dissolved Potassium (K)	2018/06/06		101	%	80 - 120
			Dissolved Sodium (Na)	2018/06/06		100	%	80 - 120
5564433	AFZ	Method Blank	Dissolved Calcium (Ca)	2018/06/06	<0.05		mg/L	
			Dissolved Magnesium (Mg)	2018/06/06	<0.05		mg/L	
			Dissolved Potassium (K)	2018/06/06	<1		mg/L	
			Dissolved Sodium (Na)	2018/06/06	<0.5		mg/L	
5564433	AFZ	RPD [GVP563-01]	Dissolved Calcium (Ca)	2018/06/06	0.74		%	25
			Dissolved Magnesium (Mg)	2018/06/06	0.41		%	25
			Dissolved Potassium (K)	2018/06/06	0.40		%	25
			Dissolved Sodium (Na)	2018/06/06	0.73		%	25
5564615	TNG	Matrix Spike	Total Arsenic (As)	2018/06/06		99	%	80 - 120
			Total Cadmium (Cd)	2018/06/06		101	%	80 - 120
			Total Calcium (Ca)	2018/06/06		NC	%	80 - 120
			Total Chromium (Cr)	2018/06/06		96	%	80 - 120
			Total Copper (Cu)	2018/06/06		101	%	80 - 120
			Total Iron (Fe)	2018/06/06		97	%	80 - 120
			Total Lead (Pb)	2018/06/06		94	%	80 - 120
			Total Magnesium (Mg)	2018/06/06		96	%	80 - 120
			Total Manganese (Mn)	2018/06/06		96	%	80 - 120
			Total Nickel (Ni)	2018/06/06		97	%	80 - 120
			Total Potassium (K)	2018/06/06		94	%	80 - 120
			Total Sodium (Na)	2018/06/06		NC	%	80 - 120
			Total Zinc (Zn)	2018/06/06		98	%	80 - 120
5564615	TNG	Spiked Blank	Total Arsenic (As)	2018/06/06		98	%	80 - 120
			Total Cadmium (Cd)	2018/06/06		99	%	80 - 120
			Total Calcium (Ca)	2018/06/06		96	%	80 - 120
			Total Chromium (Cr)	2018/06/06		95	%	80 - 120

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Copper (Cu)	2018/06/06		97	%	80 - 120
			Total Iron (Fe)	2018/06/06		96	%	80 - 120
			Total Lead (Pb)	2018/06/06		95	%	80 - 120
			Total Magnesium (Mg)	2018/06/06		97	%	80 - 120
			Total Manganese (Mn)	2018/06/06		96	%	80 - 120
			Total Nickel (Ni)	2018/06/06		97	%	80 - 120
			Total Potassium (K)	2018/06/06		96	%	80 - 120
			Total Sodium (Na)	2018/06/06		96	%	80 - 120
			Total Zinc (Zn)	2018/06/06		102	%	80 - 120
5564615	TNG	Method Blank	Total Arsenic (As)	2018/06/06	<1.0		ug/L	
			Total Cadmium (Cd)	2018/06/06	<0.10		ug/L	
			Total Calcium (Ca)	2018/06/06	<200		ug/L	
			Total Chromium (Cr)	2018/06/06	<5.0		ug/L	
			Total Copper (Cu)	2018/06/06	<1.0		ug/L	
			Total Iron (Fe)	2018/06/06	<100		ug/L	
			Total Lead (Pb)	2018/06/06	<0.50		ug/L	
			Total Magnesium (Mg)	2018/06/06	<50		ug/L	
			Total Manganese (Mn)	2018/06/06	<2.0		ug/L	
			Total Nickel (Ni)	2018/06/06	<1.0		ug/L	
			Total Potassium (K)	2018/06/06	<200		ug/L	
			Total Sodium (Na)	2018/06/06	<100		ug/L	
			Total Zinc (Zn)	2018/06/06	<5.0		ug/L	
5564615	TNG	RPD	Total Cadmium (Cd)	2018/06/06	NC		%	20
			Total Chromium (Cr)	2018/06/06	0.21		%	20
			Total Copper (Cu)	2018/06/06	0.72		%	20
			Total Iron (Fe)	2018/06/06	0.95		%	20
			Total Lead (Pb)	2018/06/06	1.3		%	20
			Total Nickel (Ni)	2018/06/06	2.2		%	20
			Total Zinc (Zn)	2018/06/06	2.2		%	20
5565033	ZSK	Matrix Spike	Phenols-4AAP	2018/06/05		94	%	80 - 120
5565033	ZSK	Spiked Blank	Phenols-4AAP	2018/06/05		97	%	80 - 120
5565033	ZSK	Method Blank	Phenols-4AAP	2018/06/05	<0.0010		mg/L	
5565033	ZSK	RPD	Phenols-4AAP	2018/06/05	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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

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Maxxam Job #: B8D1259
Report Date: 2018/06/07

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

Exceedence Summary Table – Prov. Water Quality Obj.

Result Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
SW1	GVP563-04	Total Phosphorus	0.01	0.021	0.020	mg/L
SW2	GVP564-05	Total Iron (Fe)	300	370	100	ug/L

Detection Limit Exceedences

Sample ID	Maxxam ID	Parameter	Criteria	Result	DL	Units
POND	GVP562-04	Total Phosphorus	0.01	<0.020	0.020	mg/L
SW2	GVP564-04	Total Phosphorus	0.01	<0.10	0.10	mg/L

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

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/09
Report #: R4841466
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7O7483
Received: 2017/11/03, 09:31

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 #: B7O7483
Report Date: 2017/11/09

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		FMF334		
Sampling Date		2017/11/02 12:00		
COC Number		635365-05-01		
	UNITS	POND	RDL	QC Batch
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	5248706
Inorganics				
pH	pH	8.19	N/A	5250805
Phenols-4AAP	mg/L	<0.0010	0.0010	5255419
Total Suspended Solids	mg/L	3	1	5250861
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	5252389
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5252393

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

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Maxxam Job #: B7O7483
Report Date: 2017/11/09

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

GENERAL COMMENTS

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

Package 1	14.0°C

Results relate only to the items tested.

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

Maxxam Job #: B7O7483
Report Date: 2017/11/09

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5250805	TA1	Spiked Blank	pH	2017/11/07		102	%	98 - 103
5250805	TA1	RPD	pH	2017/11/07	0.074		%	N/A
5250861	XZH	QC Standard	Total Suspended Solids	2017/11/08		99	%	85 - 115
5250861	XZH	Method Blank	Total Suspended Solids	2017/11/08	<1		mg/L	
5250861	XZH	RPD	Total Suspended Solids	2017/11/08	3.0		%	25
5252389	MA4	Spiked Blank	Total Oil & Grease	2017/11/07		98	%	85 - 115
5252389	MA4	RPD	Total Oil & Grease	2017/11/07	3.8		%	25
5252389	MA4	Method Blank	Total Oil & Grease	2017/11/07	<0.50		mg/L	
5252393	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/11/07		97	%	85 - 115
5252393	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2017/11/07	4.1		%	25
5252393	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/11/07	<0.50		mg/L	
5255419	ZSK	Matrix Spike	Phenols-4AAP	2017/11/08		94	%	80 - 120
5255419	ZSK	Spiked Blank	Phenols-4AAP	2017/11/08		96	%	80 - 120
5255419	ZSK	Method Blank	Phenols-4AAP	2017/11/08	<0.0010		mg/L	
5255419	ZSK	RPD	Phenols-4AAP	2017/11/08	NC		%	20

N/A = Not Applicable

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

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

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

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

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

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

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Maxxam Job #: B7O7483
Report Date: 2017/11/09

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

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-06-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/17
Report #: R4863154
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P3110
Received: 2017/11/10, 09:33

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2017/11/17	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/11/17	2017/11/17	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/11/13	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/11/16	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2017/11/17	2017/11/17	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/11/13	2017/11/13	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-06-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/17
Report #: R4863154
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P3110
Received: 2017/11/10, 09:33

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 #: B7P3110
Report Date: 2017/11/17

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			FNJ710		
Sampling Date			2017/11/09 12:48		
COC Number			635365-06-01		
	UNITS	**Criteria**	**POND**	**RDL**	**QC Batch**
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	1.1	0.50	5259239
Inorganics					
pH	pH	**6.5:8.5**	7.63	N/A	5261642
Phenols-4AAP	mg/L	**0.001**	0.0010	0.0010	5269718
Total Suspended Solids	mg/L	**-**	3	1	5263096
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	1.1	0.50	5271204
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	5271225

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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Maxxam Job #: B7P3110
Report Date: 2017/11/17

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

GENERAL COMMENTS

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

Package 1	11.3°C

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

Results relate only to the items tested.

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

Maxxam Job #: B7P3110
Report Date: 2017/11/17

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5261642	TA1	Spiked Blank	pH	2017/11/13		101	%	98 - 103
5261642	TA1	RPD	pH	2017/11/13	0.18		%	N/A
5263096	XZH	QC Standard	Total Suspended Solids	2017/11/13		95	%	85 - 115
5263096	XZH	Method Blank	Total Suspended Solids	2017/11/13	<1		mg/L	
5263096	XZH	RPD	Total Suspended Solids	2017/11/13	18		%	25
5269718	ZSK	Matrix Spike	Phenols-4AAP	2017/11/16		101	%	80 - 120
5269718	ZSK	Spiked Blank	Phenols-4AAP	2017/11/16		96	%	80 - 120
5269718	ZSK	Method Blank	Phenols-4AAP	2017/11/16	<0.0010		mg/L	
5269718	ZSK	RPD	Phenols-4AAP	2017/11/16	NC		%	20
5271204	FA	Spiked Blank	Total Oil & Grease	2017/11/17		101	%	85 - 115
5271204	FA	RPD	Total Oil & Grease	2017/11/17	2.8		%	25
5271204	FA	Method Blank	Total Oil & Grease	2017/11/17	<0.50		mg/L	
5271225	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/11/17		92	%	85 - 115
5271225	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/11/17	1.8		%	25
5271225	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/11/17	<0.50		mg/L	

N/A = Not Applicable

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

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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 (absolute difference <= 2x RDL).

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Maxxam Job #: B7P3110
Report Date: 2017/11/17

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

VALIDATION SIGNATURE PAGE

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Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/24
Report #: R4874172
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P9258
Received: 2017/11/17, 09:49

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2017/11/23	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/11/23	2017/11/23	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/11/20	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/11/22	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2017/11/23	2017/11/23	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/11/20	2017/11/20	CAM SOP-00428	SM 22 2540D m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-03-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/24
Report #: R4874172
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7P9258
Received: 2017/11/17, 09:49

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 #: B7P9258
Report Date: 2017/11/24

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

RESULTS OF ANALYSES OF WATER

Maxxam ID			FOQ241		
Sampling Date			2017/11/16 09:50		
COC Number			635365-03-01		
	UNITS	Criteria	POND	RDL	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	-	<0.50	0.50	5270959
Inorganics					
pH	pH	**6.5:8.5**	7.59	N/A	5273022
Phenols-4AAP	mg/L	**0.001**	**0.0012**	0.0010	5278680
Total Suspended Solids	mg/L	**-**	3	1	5273825
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	**-**	<0.50	0.50	5281331
Total Oil & Grease Mineral/Synthetic	mg/L	**0.5**	<0.50	0.50	5281334

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Criteria: Ontario Provincial Water Quality Objectives
Ref. to MOEE Water Management document dated Feb.1999
N/A = Not Applicable

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

Maxxam Job #: B7P9258
Report Date: 2017/11/24

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

GENERAL COMMENTS

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

Package 1	12.3°C

Results relate only to the items tested.

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

Maxxam Job #: B7P9258
Report Date: 2017/11/24

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5273022	TA1	Spiked Blank	pH	2017/11/20		102	%	98 - 103
5273022	TA1	RPD	pH	2017/11/20	1.5		%	N/A
5273825	XZH	QC Standard	Total Suspended Solids	2017/11/20		96	%	85 - 115
5273825	XZH	Method Blank	Total Suspended Solids	2017/11/20	<1		mg/L	
5273825	XZH	RPD	Total Suspended Solids	2017/11/20	5.4		%	25
5278680	ZSK	Matrix Spike	Phenols-4AAP	2017/11/22		96	%	80 - 120
5278680	ZSK	Spiked Blank	Phenols-4AAP	2017/11/22		100	%	80 - 120
5278680	ZSK	Method Blank	Phenols-4AAP	2017/11/22	<0.0010		mg/L	
5278680	ZSK	RPD	Phenols-4AAP	2017/11/22	NC		%	20
5281331	MA4	Spiked Blank	Total Oil & Grease	2017/11/23		98	%	85 - 115
5281331	MA4	RPD	Total Oil & Grease	2017/11/23	1.4		%	25
5281331	MA4	Method Blank	Total Oil & Grease	2017/11/23	<0.50		mg/L	
5281334	MA4	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/11/23		96	%	85 - 115
5281334	MA4	RPD	Total Oil & Grease Mineral/Synthetic	2017/11/23	2.4		%	25
5281334	MA4	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/11/23	<0.50		mg/L	

N/A = Not Applicable

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

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

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

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

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

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

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Maxxam Job #: B7P9258
Report Date: 2017/11/24

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

VALIDATION SIGNATURE PAGE

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

Brad Newman, Scientific Service Specialist

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

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/30
Report #: R4882567
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7Q5674
Received: 2017/11/24, 10:02

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2017/11/30	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/11/30	2017/11/30	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/11/28	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/11/28	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2017/11/30	2017/11/30	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/11/27	2017/11/27	CAM SOP-00428	SM 22 2540D m

Remarks:

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 635365-04-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/11/30
Report #: R4882567
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7Q5674
Received: 2017/11/24, 10:02

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 #: B7Q5674
Report Date: 2017/11/30

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		FPV963		FPV963	
Sampling Date		2017/11/23 12:20		2017/11/23 12:20	
COC Number		635365-04-01		635365-04-01	
	UNITS	POND	RDL	POND Lab-Dup	QC Batch
Calculated Parameters					
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	N/A	5282934
Inorganics					
pH	pH	8.04	N/A	8.08	5286355
Phenols-4AAP	mg/L	<0.0010	0.0010	N/A	5288331
Total Suspended Solids	mg/L	3	1	N/A	5286279
Petroleum Hydrocarbons					
Total Oil & Grease	mg/L	<0.50	0.50	N/A	5292203
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	N/A	5292204

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

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Maxxam Job #: B7Q5674
Report Date: 2017/11/30

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

GENERAL COMMENTS

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

Package 1	11.3°C

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

Results relate only to the items tested.

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Maxxam Job #: B7Q5674
Report Date: 2017/11/30

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5286279	RAY	QC Standard	Total Suspended Solids	2017/11/27		95	%	85 - 115
5286279	RAY	Method Blank	Total Suspended Solids	2017/11/27	<1		mg/L	
5286279	RAY	RPD	Total Suspended Solids	2017/11/27	3.2		%	25
5286355	TA1	Spiked Blank	pH	2017/11/28		102	%	98 - 103
5286355	TA1	RPD [FPV963-02]	pH	2017/11/28	0.53		%	N/A
5288331	ZSK	Matrix Spike	Phenols-4AAP	2017/11/28		93	%	80 - 120
5288331	ZSK	Spiked Blank	Phenols-4AAP	2017/11/28		99	%	80 - 120
5288331	ZSK	Method Blank	Phenols-4AAP	2017/11/28	<0.0010		mg/L	
5288331	ZSK	RPD	Phenols-4AAP	2017/11/28	NC		%	20
5292203	AMJ	Spiked Blank	Total Oil & Grease	2017/11/30		96	%	85 - 115
5292203	AMJ	RPD	Total Oil & Grease	2017/11/30	3.7		%	25
5292203	AMJ	Method Blank	Total Oil & Grease	2017/11/30	<0.50		mg/L	
5292204	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/11/30		93	%	85 - 115
5292204	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2017/11/30	3.0		%	25
5292204	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/11/30	<0.50		mg/L	

N/A = Not Applicable

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

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

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

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

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

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

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Maxxam Job #: B7Q5674
Report Date: 2017/11/30

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/12/08
Report #: R4902117
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R1669
Received: 2017/12/01, 11:04

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2017/12/07	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/12/06	2017/12/07	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/12/04	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/12/06	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2017/12/06	2017/12/07	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/12/02	2017/12/02	CAM SOP-00428	SM 22 2540D m

Remarks:

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) Note: TPH (Heavy Oil) is equivalent to Mineral / Synthetic Oil & Grease

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 628645-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/12/08
Report #: R4902117
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R1669
Received: 2017/12/01, 11:04

Encryption Key

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

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Maxxam Job #: B7R1669
Report Date: 2017/12/08

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		FRB729		
Sampling Date		2017/11/30 13:18		
COC Number		628645-05-01		
	UNITS	**POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	<0.50	0.50	5294520
Inorganics				
pH	pH	8.16	N/A	5296515
Phenols-4AAP	mg/L	<0.0010	0.0010	5302604
Total Suspended Solids	mg/L	2	1	5296360
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	<0.50	0.50	5301404
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5301411

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

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Maxxam Job #: B7R1669
Report Date: 2017/12/08

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

GENERAL COMMENTS

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

Package 1	13.0°C

Results relate only to the items tested.

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Maxxam Job #: B7R1669
Report Date: 2017/12/08

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5296360	XZH	QC Standard	Total Suspended Solids	2017/12/02		99	%	85 - 115
5296360	XZH	Method Blank	Total Suspended Solids	2017/12/02	<1		mg/L	
5296360	XZH	RPD	Total Suspended Solids	2017/12/02	15		%	25
5296515	TA1	Spiked Blank	pH	2017/12/04		102	%	98 - 103
5296515	TA1	RPD	pH	2017/12/04	0.11		%	N/A
5301404	AMJ	Spiked Blank	Total Oil & Grease	2017/12/07		98	%	85 - 115
5301404	AMJ	RPD	Total Oil & Grease	2017/12/07	2.8		%	25
5301404	AMJ	Method Blank	Total Oil & Grease	2017/12/07	<0.50		mg/L	
5301411	AMJ	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/12/07		94	%	85 - 115
5301411	AMJ	RPD	Total Oil & Grease Mineral/Synthetic	2017/12/07	1.2		%	25
5301411	AMJ	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/12/07	<0.50		mg/L	
5302604	ZSK	Matrix Spike	Phenols-4AAP	2017/12/06		99	%	80 - 120
5302604	ZSK	Spiked Blank	Phenols-4AAP	2017/12/06		98	%	80 - 120
5302604	ZSK	Method Blank	Phenols-4AAP	2017/12/06	<0.0010		mg/L	
5302604	ZSK	RPD	Phenols-4AAP	2017/12/06	NC		%	20

N/A = Not Applicable

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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.

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Maxxam Job #: B7R1669
Report Date: 2017/12/08

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

VALIDATION SIGNATURE PAGE

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Cristina Carriere

Cristina Carriere, Scientific Service Specialist

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Maxxam
A Bureau Veritas Group Company

Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 641481-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/12/13
Report #: R4908671
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R8903
Received: 2017/12/08, 09:35

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Animal and Vegetable Oil and Grease	1	N/A	2017/12/13	CAM SOP-00326	EPA1664B m,SM5520B m
Total Oil and Grease	1	2017/12/13	2017/12/13	CAM SOP-00326	EPA1664B m,SM5520A m
pH	1	N/A	2017/12/12	CAM SOP-00413	SM 4500H+ B m
Phenols (4AAP)	1	N/A	2017/12/12	CAM SOP-00444	OMOE E3179 m
Mineral/Synthetic O & G (TPH Heavy Oil) (1)	1	2017/12/13	2017/12/13	CAM SOP-00326	EPA1664B m,SM5520F m
Low Level Total Suspended Solids	1	2017/12/11	2017/12/11	CAM SOP-00428	SM 22 2540D m

Remarks:

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

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Maxxam
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Your Project #: 1407634
Site#: 1407634
Site Location: MCCARTHY
Your C.O.C. #: 641481-05-01

Attention:Dawn Hoyle/Jamie Bonany

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

Report Date: 2017/12/13
Report #: R4908671
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7R8903
Received: 2017/12/08, 09:35

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

Maxxam Job #: B7R8903
Report Date: 2017/12/13

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

RESULTS OF ANALYSES OF WATER

Maxxam ID		FSM780		
Sampling Date		2017/12/07 14:48		
COC Number		641481-05-01		
	UNITS	**POND**	**RDL**	**QC Batch**
Calculated Parameters				
Total Animal/Vegetable Oil and Grease	mg/L	2.7	0.50	5307843
Inorganics				
pH	pH	8.20	N/A	5310122
Phenols-4AAP	mg/L	<0.0010	0.0010	5309785
Total Suspended Solids	mg/L	4	1	5309195
Petroleum Hydrocarbons				
Total Oil & Grease	mg/L	2.7	0.50	5312824
Total Oil & Grease Mineral/Synthetic	mg/L	<0.50	0.50	5312830

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

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Maxxam Job #: B7R8903
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Golder Associates Ltd
Client Project #: 1407634
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GENERAL COMMENTS

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

Package 1	9.0°C

Results relate only to the items tested.

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Maxxam Job #: B7R8903
Report Date: 2017/12/13

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

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5309195	XZH	QC Standard	Total Suspended Solids	2017/12/11		96	%	85 - 115
5309195	XZH	Method Blank	Total Suspended Solids	2017/12/11	<1		mg/L	
5309195	XZH	RPD	Total Suspended Solids	2017/12/11	8.0		%	25
5309785	ZSK	Matrix Spike	Phenols-4AAP	2017/12/12		101	%	80 - 120
5309785	ZSK	Spiked Blank	Phenols-4AAP	2017/12/12		99	%	80 - 120
5309785	ZSK	Method Blank	Phenols-4AAP	2017/12/12	<0.0010		mg/L	
5309785	ZSK	RPD	Phenols-4AAP	2017/12/12	NC		%	20
5310122	TA1	Spiked Blank	pH	2017/12/12		102	%	98 - 103
5310122	TA1	RPD	pH	2017/12/12	0.65		%	N/A
5312824	FA	Matrix Spike	Total Oil & Grease	2017/12/13		89	%	75 - 125
5312824	FA	Spiked Blank	Total Oil & Grease	2017/12/13		94	%	85 - 115
5312824	FA	RPD	Total Oil & Grease	2017/12/13	4.4		%	25
5312824	FA	Method Blank	Total Oil & Grease	2017/12/13	<0.50		mg/L	
5312830	FA	Spiked Blank	Total Oil & Grease Mineral/Synthetic	2017/12/13		94	%	85 - 115
5312830	FA	RPD	Total Oil & Grease Mineral/Synthetic	2017/12/13	3.0		%	25
5312830	FA	Method Blank	Total Oil & Grease Mineral/Synthetic	2017/12/13	<0.50		mg/L	

N/A = Not Applicable

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

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

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

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

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

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

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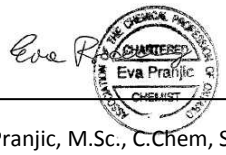
Maxxam Job #: B7R8903
Report Date: 2017/12/13

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

VALIDATION SIGNATURE PAGE

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



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

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AGAT Laboratories

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

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

ATTENTION TO: **Scott Patrick**

PROJECT: **1407634**

AGAT WORK ORDER: **18M344734**

ECOTOX ANALYSIS REVIEWED BY: **Marie-Lou Cuerrier, Lab Coordinator**

DATE REPORTED: **2018-06-12**

VERSION*: **1**

PAGES (INCLUDING COVER): **4**

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

*NOTES

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

AGAT Laboratories

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Certificate of Analysis

AGAT WORK ORDER: 18M344734

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:SDP/QEH

SAMPLING SITE:McCarthy

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

DATE RECEIVED: 2018-05-31

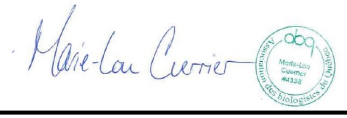
DATE REPORTED: 2018-06-12

				SAMPLE DESCRIPTION:	POND
				SAMPLE TYPE:	SW
				DATE SAMPLED:	2018-05-30
Parameter	Unit	G / S	RDL	9284919	
Mortality 100% v/v	% mortality-48h			0	
Acute Lethality				NO	

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

9284919 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 18M344734

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Scott Patrick

SAMPLED BY:SDP/QEH

SAMPLING SITE:McCarthy

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

DATE RECEIVED: 2018-05-31

DATE REPORTED: 2018-06-12

			SAMPLE DESCRIPTION:		POND
			SAMPLE TYPE:		SW
			DATE SAMPLED:		2018-05-30
Parameter	**Unit**	**G / S**	**RDL**		**9284919**
Mortality 100% v/v	% mortality-96h				0
Acute Lethality					NO

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

9284919 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:

AGAT Laboratories
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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 18M344734

PROJECT: 1407634

ATTENTION TO: Scott Patrick

SAMPLED BY:SDP/QEH

SAMPLING SITE:McCarthy

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

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

ATTENTION TO: Jamie Bonany

PROJECT: 1407634

AGAT WORK ORDER: 18M314072

ECOTOX ANALYSIS REVIEWED BY: Marie-Lou Cuerrier, Lab Coordinator

DATE REPORTED: 2018-03-15

VERSION*: 1

PAGES (INCLUDING COVER): 4

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

*NOTES

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

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Certificate of Analysis

AGAT WORK ORDER: 18M314072

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-15

		SAMPLE DESCRIPTION:		POND
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2018-02-22
Parameter	Unit	G / S	RDL	9082439
Mortality 100% v/v	% mortality-48h			0
Acute Lethality				NO

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

9082439 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%

Certified By:

AGAT Laboratories
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Certificate of Analysis

AGAT WORK ORDER: 18M314072

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

DATE RECEIVED: 2018-02-23

DATE REPORTED: 2018-03-15

		SAMPLE DESCRIPTION:		POND
		SAMPLE TYPE:		SW
		DATE SAMPLED:		2018-02-22
Parameter	Unit	G / S	RDL	9082439
Mortality 100% v/v	% mortality-96h			0
Acute Lethality				NO

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

9082439 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:

AGAT Laboratories

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http://www.agatlabs.com

Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 18M314072

PROJECT: 1407634

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

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

ATTENTION TO: Jamie Bonany

PROJECT: 1407634

AGAT WORK ORDER: 18M325121

ECOTOX ANALYSIS REVIEWED BY: Virginie Bérubé, biologiste

DATE REPORTED: 2018-04-11

VERSION*: 1

PAGES (INCLUDING COVER): 4

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

*NOTES

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

AGAT Laboratories

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FAX (514)333-3046
http://www.agatlabs.com

Certificate of Analysis

AGAT WORK ORDER: 18M325121

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

Daphnia Lethality (D. magna) LC50-48h

DATE RECEIVED: 2018-03-31

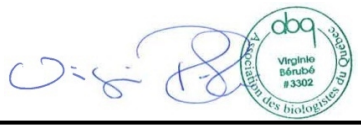
DATE REPORTED: 2018-04-11

				SAMPLE TYPE:	SW
				DATE SAMPLED:	2018-03-29
Parameter	Unit	G / S	RDL		9157695
Mortality 100% v/v	% mortality-48h				0
LC50-48h	% v/v				>100
95% LCL	% v/v				NA
95% UCL	% v/v				NA
Statistics					NONE
Toxic Unit	T.U.				<1.0
Acute Lethality					NO

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

9157695 Refer to the annex for analysis details.
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:



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Certificate of Analysis

AGAT WORK ORDER: 18M325121

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

DATE RECEIVED: 2018-03-31

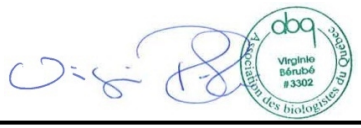
DATE REPORTED: 2018-04-11

				SAMPLE TYPE:	SW
				DATE SAMPLED:	2018-03-29
Parameter	Unit	G / S	RDL	9157695	
Mortality 100% v/v	% mortality-96h			0	
Acute Lethality				NO	

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

9157695 Refer to the annex for analysis details.
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:



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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 18M325121

PROJECT: 1407634

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

PARAMETER	DATE PREPARED	DATE ANALYZED	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
ECOTOX Analysis					
Mortality 100% v/v					
LC50-48h				EPS1/RM/11, 05/1996; EPS1/RM/14, 12/2000	
95% LCL				EPS1/RM/11, 05/1996; EPS1/RM/14, 12/2000	
95% UCL				EPS1/RM/11, 05/1996; EPS1/RM/14, 12/2000	
Statistics				EPS1/RM/11, 05/1996; EPS1/RM/14, 12/2000	
Toxic Unit				EPS1/RM/11, 05/1996; EPS1/RM/14, 12/2000	
Acute Lethality					
Mortality 100% v/v			ECO-152-20000F	EPS1/RM/13	
Acute Lethality					

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

ATTENTION TO: Jamie Bonany

PROJECT: 1407634

AGAT WORK ORDER: 18M335117

DATE REPORTED: 2018-05-15

VERSION*: 1

PAGES (INCLUDING COVER): 5

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

*NOTES

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

AGAT Laboratories

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

Certificate of Analysis

AGAT WORK ORDER: 18M335117

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

DATE RECEIVED: 2018-05-03

DATE REPORTED: 2018-05-15

				SAMPLE DESCRIPTION:	POND
				SAMPLE TYPE:	SW
				DATE SAMPLED:	2018-04-30
Parameter	Unit	G / S	RDL	9217741	
Mortality 100% v/v	% mortality-48h			0	
Acute Lethality				NO	

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

9217741 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%

Certified By:

AGAT Laboratories

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

Certificate of Analysis

AGAT WORK ORDER: 18M335117

PROJECT: 1407634

CLIENT NAME: GOLDER ASSOCIATES LTD.

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

DATE RECEIVED: 2018-05-03

DATE REPORTED: 2018-05-15

				SAMPLE DESCRIPTION:	POND
				SAMPLE TYPE:	SW
				DATE SAMPLED:	2018-04-30
Parameter	Unit	G / S	RDL	9217741	
Mortality 100% v/v	% mortality-96h			0	
Acute Lethality				NO	

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

9217741 Refer to the annex for analysis details.
Conclusion legend:
Acute lethality: NO (mortality: 50% or less)
Acute lethality: YES (mortality: more than 50%)

Certified By:

AGAT Laboratories

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Method Summary

CLIENT NAME: GOLDER ASSOCIATES LTD.

AGAT WORK ORDER: 18M335117

PROJECT: 1407634

ATTENTION TO: Jamie Bonany

SAMPLED BY:

SAMPLING SITE:

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

AGAT Laboratories

5835 Coopers Avenue
Mississauga, Ontario L4Z 1Y2
Ph: 905.712.5100 Fax: 905.712.5122
webearth.agatlabs.com

Chain of Custody Record

If this is a Drinking Water sample, please use Drinking Water Chain of Custody Form (potable water intended for human consumption)

Laboratory Use Only

Work Order #: 18433S 117

Cooler Quantity:

Arrival Temperatures: 20.8°C.

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Notes:

Report Information:

Company: Golder Associates
Contact: & Jamie Bonany
Address: 121 Commerce Park Drive unit C, Barrie, ON
Phone: 705 722 4492 Fax:
Reports to be sent to:
1. Email: Jamie-bonany@golder.com
2. Email: Scott-patrick@golder.com

Regulatory Requirements: ☐ No Regulatory Requirement

(Please check all applicable boxes)

☐ Regulation 153/04
Table (Indicate One) ☐ Ind/Com ☐ Res/Park ☐ Agriculture
Soil Texture (Check One) ☐ Coarse ☐ Fine

☐ Sewer Use
☐ Sanitary ☐ Storm
Region (Indicate One)

☐ Regulation 558
☐ CCME
☒ Prov. Water Quality Objectives (PWQO)
☐ Other
(Indicate One)

Turnaround Time (TAT) Required:

Regular TAT ☒ 5 to 7 Business Days

Rush TAT (Rush Surcharges Apply)

☐ 3 Business Days ☐ 2 Business Days ☐ Next Business Day

OR Date Required (Rush Surcharges May Apply):

Please provide prior notification for rush TAT
*TAT is exclusive of weekends and statutory holidays

For 'Same Day' analysis, please contact your AGAT CPM

Project Information:

Project: 1407634
Site Location: McCarthy (Brechin)
Sampled By: SDP
AGAT Quote #: 60738 PO:
Please note: If quotation number is not provided, client will be billed full price for analysis.

Is this submission for a **Record of Site Condition?** ☐ Yes ☒ No

Report Guideline on Certificate of Analysis ☒ Yes ☐ No

Invoice Information:

Bill To Same: Yes ☒ No ☐

Company:
Contact: Patti Chypde
Address:
Email:

Sample Matrix Legend

B	Biota
GW	Ground Water
O	Oil
P	Paint
S	Soil
SD	Sediment
SW	Surface Water

Sample Identification	Date Sampled	Time Sampled	# of Containers	Sample Matrix	Comments/ Special Instructions	Field Filtered - Metals, Hg, CrVI (Y/N)	O. Reg 153: Metals and Inorganics (☐ All Metals ☐ 153 Metals (excl. Hydrides) ☐ Hydride Metals)	O. Reg 153: ORPs: ☐ B-HWS ☐ Cl⁻ ☐ CN ☐ Cr⁶⁺ ☐ EC ☐ FOC ☐ Hg ☐ pH ☐ SAR	Full Metals Scan	Regulation/Custom Metals	Nutrients: ☐ TP ☐ NH_3 ☐ TKN ☐ NO_3 ☐ NO_2 ☐ NO_3+NO_2	Volatiles: ☐ VOC ☐ BTEX ☐ THM	CCME Fractions 1 to 4	ABNs	PAHs	PCBs: ☐ Total ☐ Aroclors	Organochlorine Pesticides	TCLP: ☐ M&I ☐ VOCs ☐ ABNs ☐ B(a)P ☐ PCBs	Sewer Use	X Single Daphnia	X Single C. Trout
POND	30-April-18	2:00 PM	1	SW																	

Samples Relinquished By (Print Name and Sign)	Date	Time	Samples Received By (Print Name and Sign)	Date	Time
SCOTT PATRICK	30-Apr-18	8:00pm			
			SP.	18-05-01	9H00

Page 1 of 1

Nº: T 068249

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http://www.agatlabs.com

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

À L'ATTENTION DE: Dawn Hoyle

N° DE PROJET: 1407634

N° BON DE TRAVAIL: 17M290835

ÉCOTOX VÉRIFIÉ PAR: Virginie Bérubé, biologiste

DATE DU RAPPORT: 2017-12-11

VERSION*: 1

NOMBRE DE PAGES: 4

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

*NOTES

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AGAT Laboratoires

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Certificat d'analyse

N° BON DE TRAVAIL: 17M290835

N° DE PROJET: 1407634

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Létalité-Daphnie (D. magna) CU-48h

DATE DE RÉCEPTION: 2017-12-02

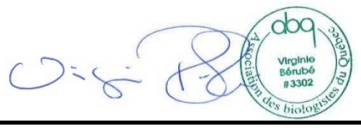
DATE DU RAPPORT: 2017-12-11

			IDENTIFICATION DE L'ÉCHANTILLON:	Pond
			MATRICE:	Eau de surface
			DATE D'ÉCHANTILLONNAGE:	2017-11-30
Paramètre	Unités	C / N	LDR	8949073
Mortalité 100% v/v	% mort-48h			0
Létalité aiguë				NO

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

8949073 Détails de l'analyse en annexe.
Légende conclusion:
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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N° BON DE TRAVAIL: 17M290835

N° DE PROJET: 1407634

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

DATE DE RÉCEPTION: 2017-12-02

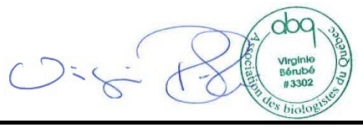
DATE DU RAPPORT: 2017-12-11

		IDENTIFICATION DE L'ÉCHANTILLON:		Pond
		MATRICE:		Eau de surface
		DATE D'ÉCHANTILLONNAGE:		2017-11-30
Paramètre	Unités	C / N	LDR	8949073
Mortalité 100% v/v	% mort-96h			0
Létalité aiguë				NO

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

8949073 Détails de l'analyse en annexe.
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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Sommaire de méthode

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

N° BON DE TRAVAIL: 17M290835

N° DE PROJET: 1407634

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

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À L'ATTENTION DE: Dawn Hoyle

N° DE PROJET:

N° BON DE TRAVAIL: 17M294826

ÉCOTOX VÉRIFIÉ PAR: Virginie Bérubé, biologiste

DATE DU RAPPORT: 2017-12-28

VERSION*: 1

NOMBRE DE PAGES: 4

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

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Certificat d'analyse

N° BON DE TRAVAIL: 17M294826

N° DE PROJET:

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Létalité-Daphnie (D. magna) CU-48h

DATE DE RÉCEPTION: 2017-12-14

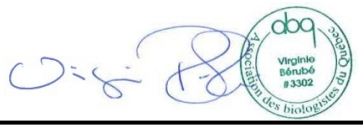
DATE DU RAPPORT: 2017-12-28

				IDENTIFICATION DE L'ÉCHANTILLON:	POND
				MATRICE:	Eau de surface
				DATE D'ÉCHANTILLONNAGE:	2017-12-13
Paramètre	Unités	C / N	LDR	8974192	
Mortalité 100% v/v	% mort-48h			0	
Létalité aiguë				NO	

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

8974192 Détails de l'analyse en annexe.
Légende conclusion:
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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N° BON DE TRAVAIL: 17M294826

N° DE PROJET:

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

DATE DE RÉCEPTION: 2017-12-14

DATE DU RAPPORT: 2017-12-28

		IDENTIFICATION DE L'ÉCHANTILLON:		POND
		MATRICE:		Eau de surface
		DATE D'ÉCHANTILLONNAGE:		2017-12-13
Paramètre	Unités	C / N	LDR	8974192
Mortalité 100% v/v	% mort-96h			0
Létalité aiguë				NO

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

8974192 Détails de l'analyse en annexe.
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

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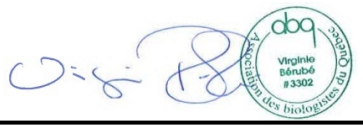

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NOM DU CLIENT: GOLDER ASSOCIATES LTD.

N° BON DE TRAVAIL: 17M294826

N° DE PROJET:

À L'ATTENTION DE: Dawn Hoyle

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

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(705) 722-4492

À L'ATTENTION DE: Jamie Bonany

N° DE PROJET: 1407634

N° BON DE TRAVAIL: 18M305604

ÉCOTOX VÉRIFIÉ PAR: Virginie Bérubé, biologiste

DATE DU RAPPORT: 2018-02-08

VERSION*: 1

NOMBRE DE PAGES: 4

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

*NOTES

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N° BON DE TRAVAIL: 18M305604

N° DE PROJET: 1407634

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Jamie Bonany

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

Létalité-Daphnie (D. magna) CU-48h

DATE DE RÉCEPTION: 2018-01-26

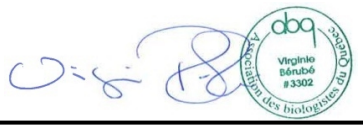
DATE DU RAPPORT: 2018-02-08

			IDENTIFICATION DE L'ÉCHANTILLON:	POND
			MATRICE:	Eau de surface
			DATE D'ÉCHANTILLONNAGE:	2018-01-25
Paramètre	Unités	C / N	LDR	9030270
Mortalité 100% v/v	% mort-48h			0
Létalité aiguë				NO

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

9030270 Détails de l'analyse en annexe.
Légende conclusion:
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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N° BON DE TRAVAIL: 18M305604

N° DE PROJET: 1407634

NOM DU CLIENT: GOLDER ASSOCIATES LTD.

À L'ATTENTION DE: Jamie Bonany

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

DATE DE RÉCEPTION: 2018-01-26

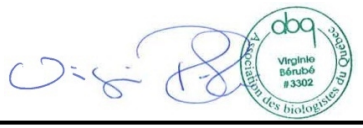
DATE DU RAPPORT: 2018-02-08

			IDENTIFICATION DE L'ÉCHANTILLON:	POND
			MATRICE:	Eau de surface
			DATE D'ÉCHANTILLONNAGE:	2018-01-25
Paramètre	Unités	C / N	LDR	9030270
Mortalité 100% v/v	% mort-96h			0
Létalité aiguë				NO

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

9030270 Détails de l'analyse en annexe.
Létalité aiguë : non (50% mortalité ou moins)
Létalité aiguë : oui (plus de 50% mortalité)

Certifié par:



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N° DE PROJET: 1407634

À L'ATTENTION DE: Jamie Bonany

PRÉLEVÉ PAR:

LIEU DE PRÉLÈVEMENT:

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

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