

APPENDIX A

Site Photographs



Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 1

Date:

August 20, 2016

Description:

Aerial View of NHL (looking SE) - Feature E (Photo 12) is visible in the lower left corner of the photo

Location:

CAM-D

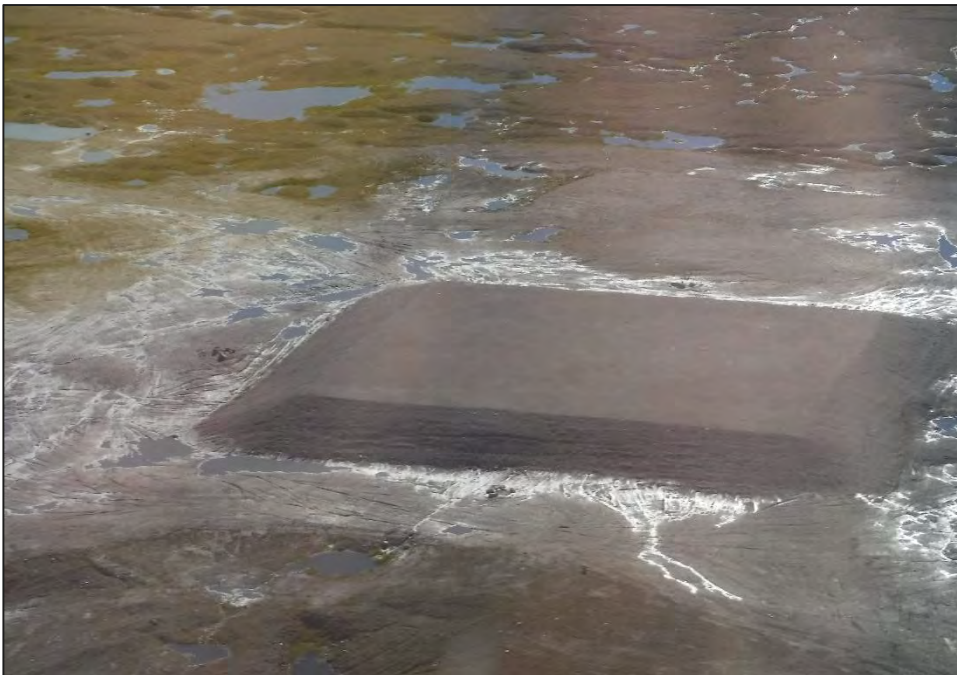


Photo: 2

Date:

August 20, 2016

Description:

Aerial View of NHL, looking SE

Location:

CAM-D

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 3

Date:

August 20, 2016

Description:

Looking NW at SE berm of
NHWL

Location:

Viewpoint 1



Photo: 4

Date:

August 20, 2016

Description:

Looking NE at SW berm of
NHWL

Location:

Viewpoint 31

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 5

Date:

August 20, 2016

Description:

Looking NW along NE berm

Location:

Viewpoint 8

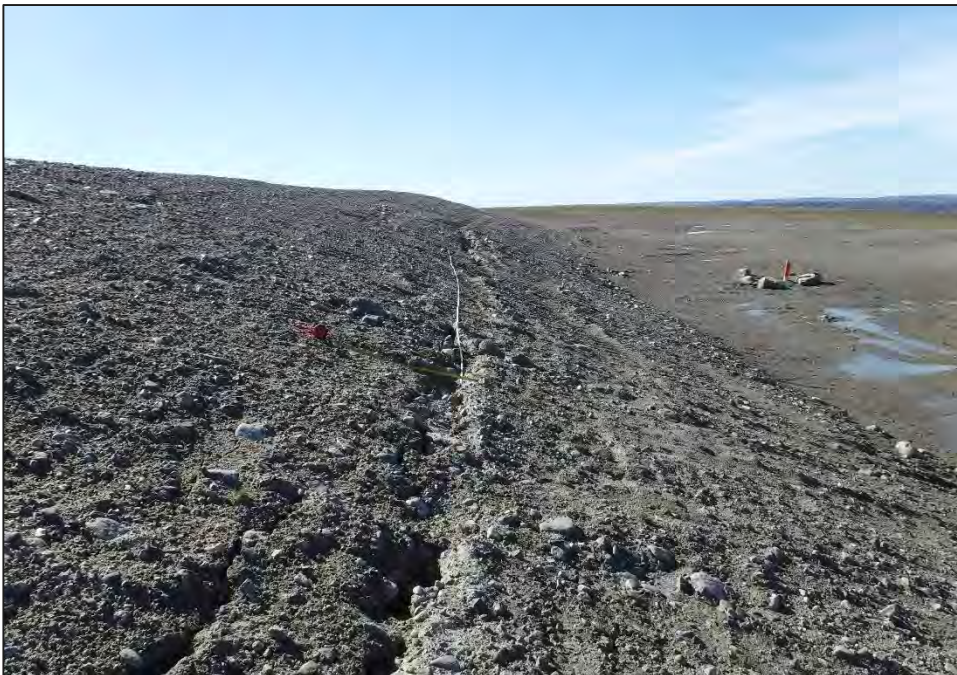


Photo: 6

Date:

August 20, 2016

Description:

Looking SW along NW berm

Location:

Viewpoint 18

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 7

Date:

August 20, 2016

Description:

Looking SE along SW berm

Location:

Viewpoint 28



Photo: 8

Date:

August 20, 2016

Description:

Looking NE along SE berm

Location:

Viewpoint 38

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 9

Date:

August 20, 2016

Description:

Feature A

Location:

Viewpoint 53



Photo: 10

Date:

August 20, 2016

Description:

Features B and N

Location:

Viewpoint 54

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 11

Date:

August 20, 2016

Description:

Features C and D

Location:

Viewpoint 55

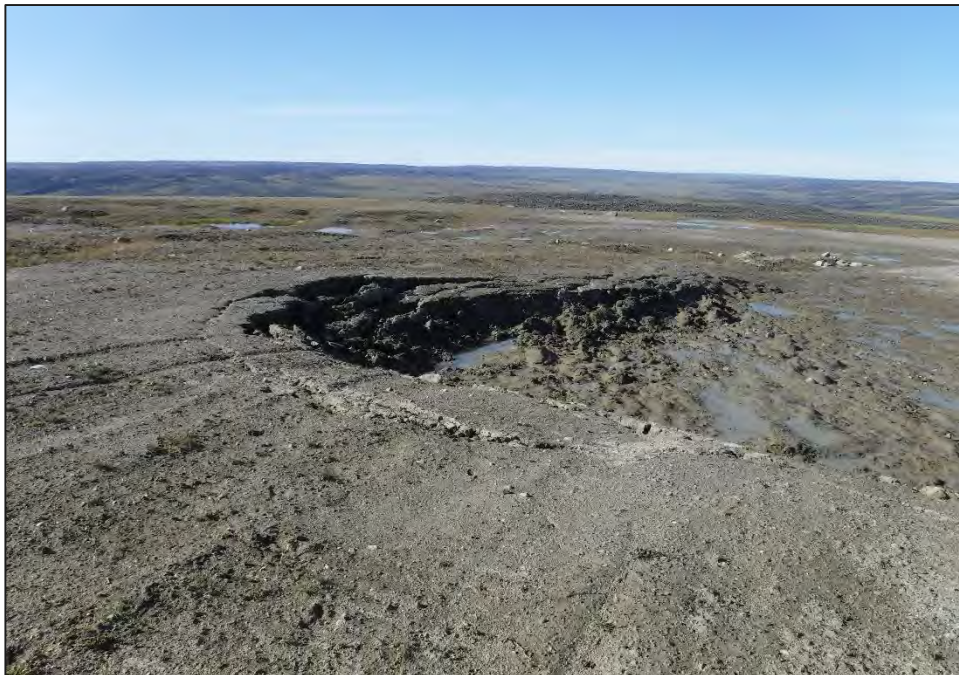


Photo: 12

Date:

August 20, 2016

Description:

Northwest end of Feature E

Location:

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake

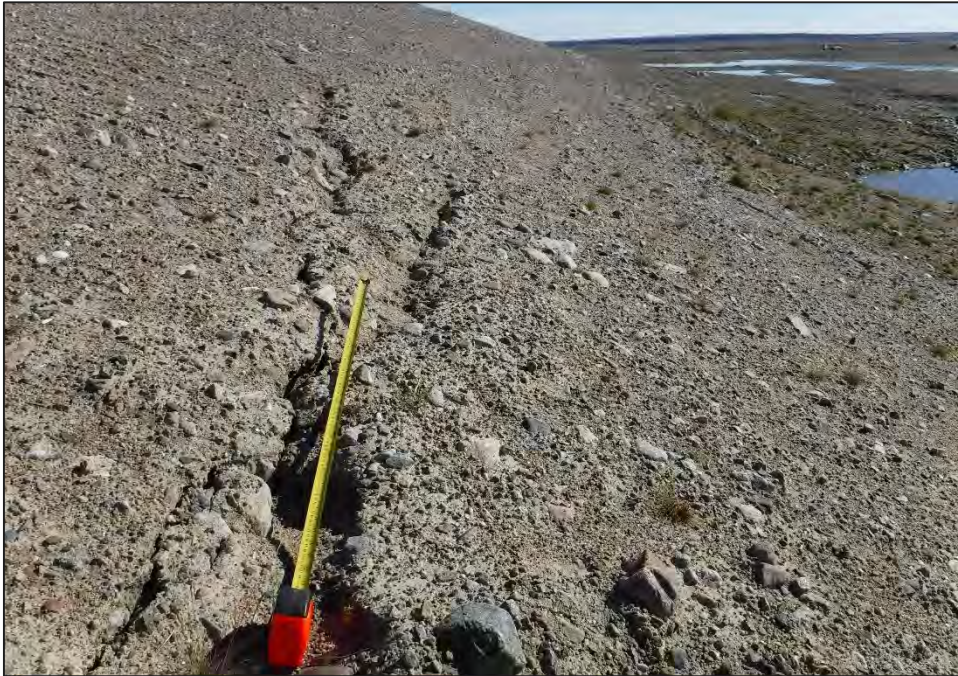


Photo: 13

Date:

August 20, 2016

Description:

Feature F

Location:

Viewpoint 61



Photo: 14

Date:

August 20, 2016

Description:

Feature G

Location:

Viewpoint 60

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 15

Date:
August 20, 2016

Description:
Feature I

Location:
Viewpoint 58



Photo: 16

Date:
August 20, 2016

Description:
Feature J

Location:
Viewpoint 57

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 17

Date:

August 20, 2016

Description:

Feature K

Location:

Viewpoint 62

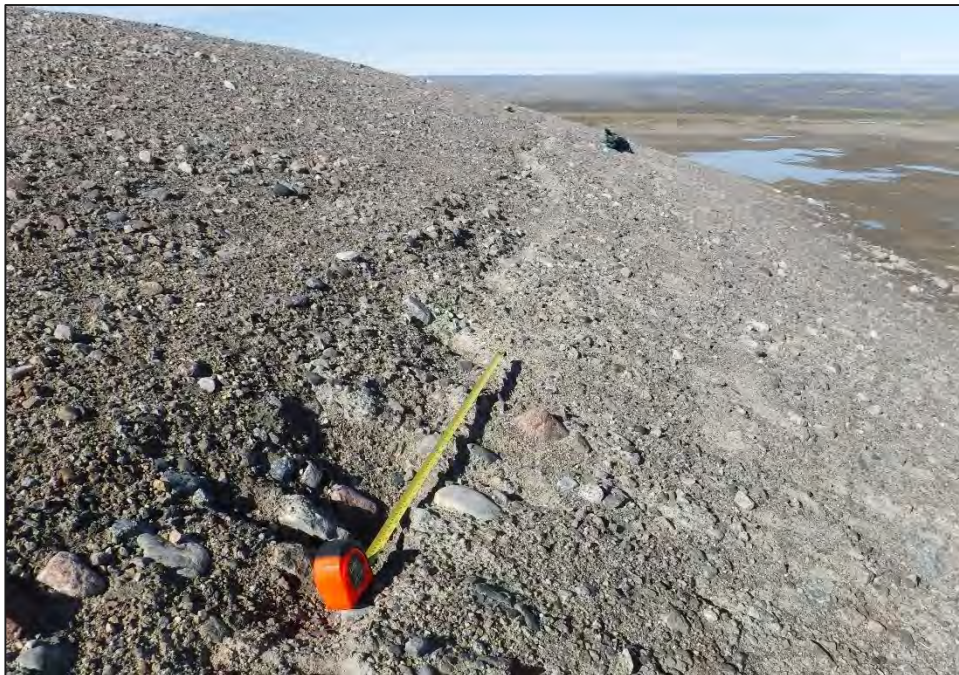


Photo: 18

Date:

August 20, 2016

Description:

Feature L

Location:

Viewpoint 63

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 19

Date:
August 20, 2016

Description:
Feature O

Location:
Viewpoint 67



Photo: 20

Date:
August 20, 2016

Description:
Feature P

Location:
Viewpoint 69

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 21

Date:

August 20, 2016

Description:

Caribou tracks

Location:

Viewpoint 68, on SE berm of
NHWL



Photo: 22

Date:

August 20, 2016

Description:

Caribou

Location:

NHWL south corner, looking
southwest

Project Photographs

Long Term Monitoring
CAM-D Simpson Lake



Photo: 23

Date:

August 20, 2016

Description:

Pooled water at northeast
end of airstrip

Location:

Aerial View from Dornier 228,
facing north



Photo: 24

Date:

August 20, 2016

Description:

Tracks made in airstrip by
Dornier 228 (2 pilots, 4
passengers, approximately
150 lbs of equipment, and no
ATVs)

Location: Approximately 340
m from southwest end of
airstrip, facing northeast

APPENDIX B

Certificates of Analysis



Your P.O. #: 100347-001
Your Project #: CAM-D
Your C.O.C. #: 501416-01-01

Attention: Elliott Holden

ARCADIS Canada
121 GRANTON DRIVE, UNIT 12
RICHMOND HILL, ON
CANADA T4B 3N4

Report Date: 2016/08/31

Report #: R2250988

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B672114

Received: 2016/08/23, 09:45

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO ₃ ,HCO ₃ ,OH	5	N/A	2016/08/25	AB SOP-00005	SM 22 2320 B m
BTEX/F1 in Water by HS GC/MS/FID	2	N/A	2016/08/29	AB SOP-00039	CCME CWS/EPA 8260c m
BTEX/F1 in Water by HS GC/MS/FID	3	N/A	2016/08/30	AB SOP-00039	CCME CWS/EPA 8260c m
Cadmium - low level CCME - Dissolved	5	N/A	2016/08/30	AB WI-00065	Auto Calc
Cadmium - low level CCME (Total)	5	N/A	2016/08/30	AB WI-00065	Auto Calc
Chloride by Automated Colourimetry	1	N/A	2016/08/25	AB SOP-00020	SM 22 4500-Cl G m
Chloride by Automated Colourimetry	4	N/A	2016/08/26	AB SOP-00020	SM 22 4500-Cl G m
True Colour	1	N/A	2016/08/25	EENVSOP-00065	SM 22 2120 C m
True Colour	4	N/A	2016/08/27	EENVSOP-00065	SM 22 2120 C m
Total Hexavalent Chromium	5	N/A	2016/08/26	AB SOP-00063	SM 22 3500-Cr B m
Conductivity @25C	5	N/A	2016/08/25	AB SOP-00005	SM 22 2510 B m
PCB in Water - Subcontract (1)	5	N/A	2016/08/29		
Fluoride	5	N/A	2016/08/25	AB SOP-00005	SM 22 4500-F C m
CCME Hydrocarbons (F2-F4 in water)	5	2016/08/28	2016/08/29	AB SOP-00037 / AB SOP-00040	CCME PHC-CWS m
Hardness	5	N/A	2016/08/31	AB WI-00065	Auto Calc
Mercury - Low Level (Dissolved)	5	2016/08/26	2016/08/26	EENVSOP-00031	EPA 1631E/245.1 R3 m
Mercury - Low Level (Total)	5	2016/08/26	2016/08/26	EENVSOP-00031	EPA 1631E/245.1 R3 m
Elements by ICP - Dissolved	5	N/A	2016/08/30	AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICP - Total	5	2016/08/30	2016/08/30	AB SOP-00014 / AB SOP-00042	EPA 200.7 CFR 2012 m
Elements by ICPMS - Dissolved	5	N/A	2016/08/30	AB SOP-00043	EPA 200.8 R5.4 m
Elements by ICPMS - Total	5	2016/08/30	2016/08/30	AB SOP-00014 / AB SOP-00043	EPA 200.8 R5.4 m
Ion Balance	5	N/A	2016/08/31	AB WI-00065	Auto Calc
Sum of cations, anions	5	N/A	2016/08/31	AB WI-00065	Auto Calc
Nitrate and Nitrite	5	N/A	2016/08/26	AB WI-00065	Auto Calc
Nitrate + Nitrite-N (calculated)	5	N/A	2016/08/26	AB WI-00065	Auto Calc
Nitrogen, (Nitrite, Nitrate) by IC	5	N/A	2016/08/25	AB SOP-00023	SM 22 4110 B m
pH @25°C	5	N/A	2016/08/25	AB SOP-00005	SM 22 4500 H+ B m
Sulphate by Automated Colourimetry	1	N/A	2016/08/25	AB SOP-00018	SM 22 4500-SO4 E m

Your P.O. #: 100347-001
Your Project #: CAM-D
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CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B672114

Received: 2016/08/23, 09:45

Sample Matrix: Water
Samples Received: 5

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Sulphate by Automated Colourimetry	4	N/A	2016/08/26	AB SOP-00018	SM 22 4500-SO4 E m
Total Dissolved Solids (Filt. Residue)	4	2016/08/26	2016/08/27	AB SOP-00065	SM 22 2540 C m
Total Dissolved Solids (Filt. Residue)	1	2016/08/27	2016/08/29	AB SOP-00065	SM 22 2540 C m
Total Dissolved Solids (Calculated)	5	N/A	2016/08/31	AB WI-00065	Auto Calc
Total Suspended Solids (NFR)	4	2016/08/26	2016/08/26	AB SOP-00061	SM 22 2540 D m
Total Suspended Solids (NFR)	1	2016/08/26	2016/08/29	AB SOP-00061	SM 22 2540 D m

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) This test was performed by Maxxam Ontario (From Edmonton)

Encryption Key

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

Parminder Virk, Project Manager

Email: PVirk@maxxam.ca

Phone# (780) 577-7100

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

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

AT1 BTEX AND F1-F4 IN WATER (WATER)

Maxxam ID		PI7088	PI7089	PI7090		PI7091	PI7092		
Sampling Date		2016/08/20 16:30	2016/08/20 14:10	2016/08/20 15:30		2016/08/20 16:10	2016/08/20		
COC Number		501416-01-01	501416-01-01	501416-01-01		501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	CAM-D MW02	CAM-D MW03	QC Batch	CAM-D MW04	CAM-D DUP	RDL	QC Batch
Ext. Pet. Hydrocarbon									
F2 (C10-C16 Hydrocarbons)	mg/L	<0.10	<0.10	<0.10	8379589	<0.10	<0.10	0.10	8379589
F3 (C16-C34 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	8379589	<0.20	<0.20	0.20	8379589
F4 (C34-C50 Hydrocarbons)	mg/L	<0.20	<0.20	<0.20	8379589	<0.20	<0.20	0.20	8379589
Reached Baseline at C50	mg/L	Yes	Yes	Yes	8379589	Yes	Yes		8379589
Volatiles									
Benzene	ug/L	<0.40	<0.40	<0.40	8380615	<0.40	<0.40	0.40	8380464
Toluene	ug/L	<0.40	<0.40	<0.40	8380615	<0.40	<0.40	0.40	8380464
Ethylbenzene	ug/L	<0.40	<0.40	<0.40	8380615	<0.40	<0.40	0.40	8380464
m & p-Xylene	ug/L	<0.80	<0.80	<0.80	8380615	<0.80	<0.80	0.80	8380464
o-Xylene	ug/L	<0.40	<0.40	<0.40	8380615	<0.40	<0.40	0.40	8380464
Xylenes (Total)	ug/L	<0.80	<0.80	<0.80	8380615	<0.80	<0.80	0.80	8380464
F1 (C6-C10) - BTEX	ug/L	<100	<100	<100	8380615	<100	<100	100	8380464
F1 (C6-C10)	ug/L	<100	<100	<100	8380615	<100	<100	100	8380464
Surrogate Recovery (%)									
1,4-Difluorobenzene (sur.)	%	96	97	96	8380615	94	102		8380464
4-Bromofluorobenzene (sur.)	%	93	92	92	8380615	100	104		8380464
D4-1,2-Dichloroethane (sur.)	%	98	97	99	8380615	108	105		8380464
O-TERPHENYL (sur.)	%	98	99	99	8379589	97	98		8379589
RDL = Reportable Detection Limit									

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		PI7088			PI7089	PI7090		
Sampling Date		2016/08/20 16:30			2016/08/20 14:10	2016/08/20 15:30		
COC Number		501416-01-01			501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	RDL	QC Batch	CAM-D MW02	CAM-D MW03	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	53	N/A	8375306	15	19	N/A	8375306
Cation Sum	meq/L	47	N/A	8375306	15	18	N/A	8375306
Hardness (CaCO ₃)	mg/L	430	0.50	8375154	640	410	0.50	8375154
Ion Balance	N/A	0.88	0.010	8375305	0.97	0.92	0.010	8375305
Dissolved Nitrate (NO ₃)	mg/L	5.8	0.044	8375530	1.1	1.4	0.044	8375530
Nitrate plus Nitrite (N)	mg/L	1.3	0.020	8375531	0.24	0.36	0.020	8375531
Dissolved Nitrite (NO ₂)	mg/L	<0.033	0.033	8375530	<0.033	0.18	0.033	8375530
Calculated Total Dissolved Solids	mg/L	3300	10	8375307	840	1100	10	8375307
Misc. Inorganics								
Conductivity	uS/cm	4400	1.0	8376231	1400	1800	1.0	8376231
pH	pH	7.96	N/A	8376229	7.60	7.86	N/A	8376229
Anions								
Alkalinity (PP as CaCO ₃)	mg/L	<0.50	0.50	8376230	<0.50	<0.50	0.50	8376230
Alkalinity (Total as CaCO ₃)	mg/L	460	0.50	8376230	350	260	0.50	8376230
Bicarbonate (HCO ₃)	mg/L	560	0.50	8376230	430	320	0.50	8376230
Carbonate (CO ₃)	mg/L	<0.50	0.50	8376230	<0.50	<0.50	0.50	8376230
Hydroxide (OH)	mg/L	<0.50	0.50	8376230	<0.50	<0.50	0.50	8376230
Dissolved Sulphate (SO ₄)	mg/L	1900 (1)	10	8376471	310 (1)	420 (1)	5.0	8377613
Dissolved Chloride (Cl)	mg/L	110	1.0	8376462	65	190	1.0	8377580
Nutrients								
Dissolved Nitrite (N)	mg/L	<0.010	0.010	8376885	<0.010	0.054	0.010	8376885
Dissolved Nitrate (N)	mg/L	1.3	0.010	8376885	0.24	0.31	0.010	8376885
Elements								
Dissolved Aluminum (Al)	mg/L	0.0079	0.0030	8381795	0.0061	0.023	0.0030	8381795
Dissolved Antimony (Sb)	mg/L	0.0014	0.00060	8381795	<0.00060	<0.00060	0.00060	8381795
Dissolved Arsenic (As)	mg/L	0.0026	0.00020	8381795	0.00029	0.0013	0.00020	8381795
Dissolved Barium (Ba)	mg/L	<0.010	0.010	8382195	<0.010	0.029	0.010	8382195
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	8381795	<0.0010	<0.0010	0.0010	8381795
Dissolved Boron (B)	mg/L	0.073	0.020	8382195	0.047	0.063	0.020	8382195
Dissolved Calcium (Ca)	mg/L	66	0.30	8382195	93	55	0.30	8382195
RDL = Reportable Detection Limit								
N/A = Not Applicable								
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		PI7088			PI7089	PI7090		
Sampling Date		2016/08/20 16:30			2016/08/20 14:10	2016/08/20 15:30		
COC Number		501416-01-01			501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	RDL	QC Batch	CAM-D MW02	CAM-D MW03	RDL	QC Batch
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	8381795	<0.0010	<0.0010	0.0010	8381795
Dissolved Cobalt (Co)	mg/L	0.00059	0.00030	8381795	0.00085	0.00031	0.00030	8381795
Dissolved Copper (Cu)	mg/L	0.012	0.00020	8381795	0.0076	0.0040	0.00020	8381795
Dissolved Iron (Fe)	mg/L	<0.060	0.060	8382195	<0.060	0.12	0.060	8382195
Dissolved Lead (Pb)	mg/L	0.00078 (1)	0.00020	8381795	<0.00020	<0.00020	0.00020	8381795
Dissolved Lithium (Li)	mg/L	0.14	0.020	8382195	0.047	0.068	0.020	8382195
Dissolved Magnesium (Mg)	mg/L	64	0.20	8382195	98	66	0.20	8382195
Dissolved Manganese (Mn)	mg/L	0.072	0.0040	8382195	0.70	0.075	0.0040	8382195
Dissolved Molybdenum (Mo)	mg/L	0.083	0.00020	8381795	0.0093	0.033	0.00020	8381795
Dissolved Nickel (Ni)	mg/L	0.026	0.00050	8381795	0.0028	0.0088	0.00050	8381795
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	8382195	<0.10	<0.10	0.10	8382195
Dissolved Potassium (K)	mg/L	18	0.30	8382195	9.0	26	0.30	8382195
Dissolved Selenium (Se)	mg/L	0.0060 (1)	0.00020	8381795	0.00030 (1)	0.00051 (1)	0.00020	8381795
Dissolved Silicon (Si)	mg/L	4.6	0.10	8382195	2.6	2.4	0.10	8382195
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	8381795	<0.00010	<0.00010	0.00010	8381795
Dissolved Sodium (Na)	mg/L	860 (2)	5.0	8382195	48	210	0.50	8382195
Dissolved Strontium (Sr)	mg/L	0.68	0.020	8382195	0.39	0.37	0.020	8382195
Dissolved Sulphur (S)	mg/L	590 (2)	2.0	8382195	100	130	0.20	8382195
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	8381795	<0.00020	<0.00020	0.00020	8381795
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	8381795	<0.0010	<0.0010	0.0010	8381795
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	8381795	<0.0010	<0.0010	0.0010	8381795
Dissolved Uranium (U)	mg/L	0.27	0.00010	8381795	0.19	0.064	0.00010	8381795
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	8381795	<0.0010	<0.0010	0.0010	8381795
Dissolved Zinc (Zn)	mg/L	0.0034	0.0030	8381795	<0.0030	0.0034	0.0030	8381795
RDL = Reportable Detection Limit								
(1) Dissolved greater than total. Results within acceptable limits of precision.								
(2) Detection limits raised due to dilution to bring analyte within the calibrated range.								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		PI7091		PI7092		
Sampling Date		2016/08/20 16:10		2016/08/20		
COC Number		501416-01-01		501416-01-01		
	UNITS	CAM-D MW04	RDL	CAM-D DUP	RDL	QC Batch
Calculated Parameters						
Anion Sum	meq/L	9.6	N/A	50	N/A	8375306
Cation Sum	meq/L	8.6	N/A	47	N/A	8375306
Hardness (CaCO ₃)	mg/L	110	0.50	430	0.50	8375154
Ion Balance	N/A	0.90	0.010	0.93	0.010	8375305
Dissolved Nitrate (NO ₃)	mg/L	1.4	0.044	5.8	0.044	8375530
Nitrate plus Nitrite (N)	mg/L	0.40	0.020	1.3	0.020	8375531
Dissolved Nitrite (NO ₂)	mg/L	0.25	0.033	<0.033	0.033	8375530
Calculated Total Dissolved Solids	mg/L	570	10	3200	10	8375307
Misc. Inorganics						
Conductivity	uS/cm	990	1.0	4400	1.0	8376231
pH	pH	8.47	N/A	7.98	N/A	8376229
Anions						
Alkalinity (PP as CaCO ₃)	mg/L	1.6	0.50	<0.50	0.50	8376230
Alkalinity (Total as CaCO ₃)	mg/L	99	0.50	460	0.50	8376230
Bicarbonate (HCO ₃)	mg/L	120	0.50	560	0.50	8376230
Carbonate (CO ₃)	mg/L	1.9	0.50	<0.50	0.50	8376230
Hydroxide (OH)	mg/L	<0.50	0.50	<0.50	0.50	8376230
Dissolved Sulphate (SO ₄)	mg/L	190	1.0	1800	1.0	8377633
Dissolved Chloride (Cl)	mg/L	130	1.0	110	1.0	8377620
Nutrients						
Dissolved Nitrite (N)	mg/L	0.077	0.010	<0.010	0.010	8376885
Dissolved Nitrate (N)	mg/L	0.33	0.010	1.3	0.010	8376885
Elements						
Dissolved Aluminum (Al)	mg/L	0.83	0.0030	0.0071	0.0030	8381795
Dissolved Antimony (Sb)	mg/L	<0.00060	0.00060	0.0014	0.00060	8381795
Dissolved Arsenic (As)	mg/L	0.0013	0.00020	0.0026	0.00020	8381795
Dissolved Barium (Ba)	mg/L	0.014	0.010	<0.010	0.010	8382195
Dissolved Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8381795
Dissolved Boron (B)	mg/L	0.058	0.020	0.072	0.020	8382195
Dissolved Calcium (Ca)	mg/L	24	0.30	66	0.30	8382195
Dissolved Chromium (Cr)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8381795
RDL = Reportable Detection Limit						
N/A = Not Applicable						

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		PI7091		PI7092		
Sampling Date		2016/08/20 16:10		2016/08/20		
COC Number		501416-01-01		501416-01-01		
	UNITS	CAM-D MW04	RDL	CAM-D DUP	RDL	QC Batch
Dissolved Cobalt (Co)	mg/L	<0.00030	0.00030	0.00059	0.00030	8381795
Dissolved Copper (Cu)	mg/L	0.0029	0.00020	0.012	0.00020	8381795
Dissolved Iron (Fe)	mg/L	<0.060	0.060	<0.060	0.060	8382195
Dissolved Lead (Pb)	mg/L	<0.00020	0.00020	0.00074	0.00020	8381795
Dissolved Lithium (Li)	mg/L	<0.020	0.020	0.15	0.020	8382195
Dissolved Magnesium (Mg)	mg/L	13	0.20	64	0.20	8382195
Dissolved Manganese (Mn)	mg/L	0.015	0.0040	0.074	0.0040	8382195
Dissolved Molybdenum (Mo)	mg/L	0.0083 (1)	0.00020	0.084	0.00020	8381795
Dissolved Nickel (Ni)	mg/L	0.00055	0.00050	0.027	0.00050	8381795
Dissolved Phosphorus (P)	mg/L	<0.10	0.10	<0.10	0.10	8382195
Dissolved Potassium (K)	mg/L	19	0.30	18	0.30	8382195
Dissolved Selenium (Se)	mg/L	0.00040 (1)	0.00020	0.0046	0.00020	8381795
Dissolved Silicon (Si)	mg/L	0.83	0.10	4.7	0.10	8382195
Dissolved Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	0.00010	8381795
Dissolved Sodium (Na)	mg/L	130	0.50	870 (2)	5.0	8382195
Dissolved Strontium (Sr)	mg/L	0.16	0.020	0.69	0.020	8382195
Dissolved Sulphur (S)	mg/L	61	0.20	600 (2)	2.0	8382195
Dissolved Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	0.00020	8381795
Dissolved Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8381795
Dissolved Titanium (Ti)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8381795
Dissolved Uranium (U)	mg/L	0.0047	0.00010	0.27	0.00010	8381795
Dissolved Vanadium (V)	mg/L	<0.0010	0.0010	<0.0010	0.0010	8381795
Dissolved Zinc (Zn)	mg/L	<0.0030	0.0030	<0.0030	0.0030	8381795

RDL = Reportable Detection Limit

(1) Dissolved greater than total. Results within acceptable limits of precision.

(2) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ROUTINE WATER & DISS. REGULATED METALS (WATER)

Maxxam ID		PI7088	PI7089	PI7090	PI7091	PI7092		
Sampling Date		2016/08/20 16:30	2016/08/20 14:10	2016/08/20 15:30	2016/08/20 16:10	2016/08/20		
COC Number		501416-01-01	501416-01-01	501416-01-01	501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	CAM-D MW02	CAM-D MW03	CAM-D MW04	CAM-D DUP	RDL	QC Batch
Low Level Elements								
Dissolved Cadmium (Cd)	ug/L	0.051	<0.020	<0.020	<0.020	0.063	0.020	8374379
RDL = Reportable Detection Limit								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		PI7088		PI7089	PI7090	PI7091		
Sampling Date		2016/08/20 16:30		2016/08/20 14:10	2016/08/20 15:30	2016/08/20 16:10		
COC Number		501416-01-01		501416-01-01	501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	RDL	CAM-D MW02	CAM-D MW03	CAM-D MW04	RDL	QC Batch
Low Level Elements								
Total Cadmium (Cd)	ug/L	0.043	0.020	0.026	<0.020	<0.020	0.020	8375553
Elements								
Total Aluminum (Al)	mg/L	0.022	0.0030	0.063	1.2	5.9	0.0030	8381251
Total Antimony (Sb)	mg/L	0.0016	0.00060	<0.00060	<0.00060	<0.00060	0.00060	8381251
Total Arsenic (As)	mg/L	0.0026	0.00020	0.00041	0.0017	0.0016	0.00020	8381251
Total Barium (Ba)	mg/L	0.011	0.010	0.011	0.039	0.039	0.010	8381254
Total Beryllium (Be)	mg/L	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	8381251
Total Boron (B)	mg/L	0.073	0.020	0.049	0.067	0.063	0.020	8381254
Total Calcium (Ca)	mg/L	67	0.30	96	60	26	0.30	8381254
Total Chromium (Cr)	mg/L	0.0011	0.0010	<0.0010	0.0029	0.0065	0.0010	8381251
Total Cobalt (Co)	mg/L	0.00063	0.00030	0.00089	0.0010	0.0015	0.00030	8381251
Total Copper (Cu)	mg/L	0.020	0.00020	0.0080	0.0071	0.013	0.00020	8381251
Total Iron (Fe)	mg/L	<0.060	0.060	0.10	2.0	4.1	0.060	8381254
Total Lead (Pb)	mg/L	0.00076	0.00020	0.0027	0.00083	0.00092	0.00020	8381251
Total Lithium (Li)	mg/L	0.15	0.020	0.051	0.078	0.029	0.020	8381254
Total Magnesium (Mg)	mg/L	65	0.20	99	72	15	0.20	8381254
Total Manganese (Mn)	mg/L	0.078	0.0040	0.73	0.11	0.075	0.0040	8381254
Total Molybdenum (Mo)	mg/L	0.085	0.00020	0.0093	0.036	0.0082	0.00020	8381251
Total Nickel (Ni)	mg/L	0.030	0.00050	0.0031	0.012	0.0037	0.00050	8381251
Total Phosphorus (P)	mg/L	<0.10	0.10	<0.10	<0.10	<0.10	0.10	8381254
Total Potassium (K)	mg/L	18	0.30	9.5	29	23	0.30	8381254
Total Selenium (Se)	mg/L	0.0049	0.00020	<0.00020	0.00039	0.00036	0.00020	8381251
Total Silicon (Si)	mg/L	4.9	0.10	2.8	4.5	7.6	0.10	8381254
Total Silver (Ag)	mg/L	<0.00010	0.00010	<0.00010	<0.00010	<0.00010	0.00010	8381251
Total Sodium (Na)	mg/L	910 (1)	5.0	51	230	140	0.50	8381254
Total Strontium (Sr)	mg/L	0.71	0.020	0.41	0.41	0.18	0.020	8381254
Total Sulphur (S)	mg/L	620 (1)	2.0	110	150	61	0.20	8381254
Total Thallium (Tl)	mg/L	<0.00020	0.00020	<0.00020	<0.00020	<0.00020	0.00020	8381251
Total Tin (Sn)	mg/L	<0.0010	0.0010	<0.0010	<0.0010	<0.0010	0.0010	8381251
Total Titanium (Ti)	mg/L	0.0014	0.0010	0.0052	0.11	0.27	0.0010	8381251
Total Uranium (U)	mg/L	0.27	0.00010	0.19	0.074	0.0048	0.00010	8381251
RDL = Reportable Detection Limit								
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		PI7088		PI7089	PI7090	PI7091		
Sampling Date		2016/08/20 16:30		2016/08/20 14:10	2016/08/20 15:30	2016/08/20 16:10		
COC Number		501416-01-01		501416-01-01	501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	RDL	CAM-D MW02	CAM-D MW03	CAM-D MW04	RDL	QC Batch
Total Vanadium (V)	mg/L	0.0010	0.0010	<0.0010	0.0047	0.0089	0.0010	8381251
Total Zinc (Zn)	mg/L	0.0052	0.0030	<0.0030	0.0069	0.011	0.0030	8381251
RDL = Reportable Detection Limit								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		PI7092		
Sampling Date		2016/08/20		
COC Number		501416-01-01		
	UNITS	CAM-D DUP	RDL	QC Batch
Low Level Elements				
Total Cadmium (Cd)	ug/L	0.072	0.020	8375553
Elements				
Total Aluminum (Al)	mg/L	0.023	0.0030	8381251
Total Antimony (Sb)	mg/L	0.0016	0.00060	8381251
Total Arsenic (As)	mg/L	0.0027	0.00020	8381251
Total Barium (Ba)	mg/L	0.011	0.010	8381254
Total Beryllium (Be)	mg/L	<0.0010	0.0010	8381251
Total Boron (B)	mg/L	0.072	0.020	8381254
Total Calcium (Ca)	mg/L	67	0.30	8381254
Total Chromium (Cr)	mg/L	0.0011	0.0010	8381251
Total Cobalt (Co)	mg/L	0.00062	0.00030	8381251
Total Copper (Cu)	mg/L	0.020	0.00020	8381251
Total Iron (Fe)	mg/L	<0.060	0.060	8381254
Total Lead (Pb)	mg/L	0.00079	0.00020	8381251
Total Lithium (Li)	mg/L	0.15	0.020	8381254
Total Magnesium (Mg)	mg/L	66	0.20	8381254
Total Manganese (Mn)	mg/L	0.080	0.0040	8381254
Total Molybdenum (Mo)	mg/L	0.086	0.00020	8381251
Total Nickel (Ni)	mg/L	0.030	0.00050	8381251
Total Phosphorus (P)	mg/L	<0.10	0.10	8381254
Total Potassium (K)	mg/L	18	0.30	8381254
Total Selenium (Se)	mg/L	0.0049	0.00020	8381251
Total Silicon (Si)	mg/L	4.9	0.10	8381254
Total Silver (Ag)	mg/L	<0.00010	0.00010	8381251
Total Sodium (Na)	mg/L	910 (1)	5.0	8381254
Total Strontium (Sr)	mg/L	0.72	0.020	8381254
Total Sulphur (S)	mg/L	610 (1)	2.0	8381254
Total Thallium (Tl)	mg/L	<0.00020	0.00020	8381251
Total Tin (Sn)	mg/L	<0.0010	0.0010	8381251
Total Titanium (Ti)	mg/L	0.0012	0.0010	8381251
RDL = Reportable Detection Limit				
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.				

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

REGULATED METALS (CCME/AT1) - TOTAL

Maxxam ID		PI7092		
Sampling Date		2016/08/20		
COC Number		501416-01-01		
	UNITS	CAM-D DUP	RDL	QC Batch
Total Uranium (U)	mg/L	0.28	0.00010	8381251
Total Vanadium (V)	mg/L	0.0011	0.0010	8381251
Total Zinc (Zn)	mg/L	0.0051	0.0030	8381251
RDL = Reportable Detection Limit				

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		PI7088			PI7089	PI7090	PI7091		
Sampling Date		2016/08/20 16:30			2016/08/20 14:10	2016/08/20 15:30	2016/08/20 16:10		
COC Number		501416-01-01			501416-01-01	501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	RDL	QC Batch	CAM-D MW02	CAM-D MW03	CAM-D MW04	RDL	QC Batch
Parameter									
Subcontract Parameter	N/A	ATTACHED	N/A	8383618	ATTACHED	ATTACHED	ATTACHED	N/A	8383618
Misc. Inorganics									
Total Dissolved Solids	mg/L	3100	10	8378619	870	1200	590	10	8378619
Total Suspended Solids	mg/L	8.0 (1)	1.5	8377550	4.0	21	61	1.0	8377616
Anions									
Dissolved Fluoride (F)	mg/L	0.64	0.050	8376232	0.93	1.4	1.1	0.050	8376232
Metals									
Total Hex. Chromium (Cr 6+)	mg/L	<0.0010	0.0010	8377393	<0.0010	<0.0010	<0.0010	0.0010	8377393
Physical Properties									
True Colour	PtCo units	18	2.0	8377619	7.1	9.1	5.1	2.0	8379456
RDL = Reportable Detection Limit									
N/A = Not Applicable									
(1) Detection limit raised based on sample volume used for analysis.									

Maxxam ID		PI7092		
Sampling Date		2016/08/20		
COC Number		501416-01-01		
	UNITS	CAM-D DUP	RDL	QC Batch
Parameter				
Subcontract Parameter	N/A	ATTACHED	N/A	8383618
Misc. Inorganics				
Total Dissolved Solids	mg/L	3100	10	8375988
Total Suspended Solids	mg/L	5.3	1.0	8377616
Anions				
Dissolved Fluoride (F)	mg/L	0.67	0.050	8376232
Metals				
Total Hex. Chromium (Cr 6+)	mg/L	<0.0010	0.0010	8377393
Physical Properties				
True Colour	PtCo units	17	2.0	8379456
RDL = Reportable Detection Limit				
N/A = Not Applicable				

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

ELEMENTS BY ATOMIC SPECTROSCOPY (WATER)

Maxxam ID		PI7088	PI7089	PI7090	PI7091	PI7092		
Sampling Date		2016/08/20 16:30	2016/08/20 14:10	2016/08/20 15:30	2016/08/20 16:10	2016/08/20		
COC Number		501416-01-01	501416-01-01	501416-01-01	501416-01-01	501416-01-01		
	UNITS	CAM-D MW01	CAM-D MW02	CAM-D MW03	CAM-D MW04	CAM-D DUP	RDL	QC Batch
Low Level Elements								
Dissolved Mercury (Hg)	ug/L	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0020	8377790
Total Mercury (Hg)	ug/L	0.0029	0.0028	0.0024	<0.0020	<0.0020	0.0020	8377810
RDL = Reportable Detection Limit								

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

GENERAL COMMENTS

Sample PI7088-01 : Dissolved greater than total for Cd. Reanalysis yields similar results. Cation anion balance investigated data quality confirmed.

Results relate only to the items tested.

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
	8375988	MPH	Matrix Spike	Total Dissolved Solids	2016/08/29		100	%	80 - 120
	8375988	MPH	Spiked Blank	Total Dissolved Solids	2016/08/29		98	%	80 - 120
	8375988	MPH	Method Blank	Total Dissolved Solids	2016/08/29	<10		mg/L	
	8375988	MPH	RPD	Total Dissolved Solids	2016/08/29	5.7		%	20
	8376229	MA4	Spiked Blank	pH	2016/08/25		100	%	97 - 103
	8376229	MA4	RPD [PI7092-01]	pH	2016/08/25	0.13		%	N/A
	8376230	MA4	Spiked Blank	Alkalinity (Total as CaCO3)	2016/08/25		100	%	80 - 120
	8376230	MA4	Method Blank	Alkalinity (PP as CaCO3)	2016/08/25	<0.50		mg/L	
				Alkalinity (Total as CaCO3)	2016/08/25	<0.50		mg/L	
				Bicarbonate (HCO3)	2016/08/25	<0.50		mg/L	
				Carbonate (CO3)	2016/08/25	<0.50		mg/L	
				Hydroxide (OH)	2016/08/25	<0.50		mg/L	
	8376230	MA4	RPD [PI7092-01]	Alkalinity (PP as CaCO3)	2016/08/25	NC		%	20
				Alkalinity (Total as CaCO3)	2016/08/25	0.77		%	20
				Bicarbonate (HCO3)	2016/08/25	0.77		%	20
				Carbonate (CO3)	2016/08/25	NC		%	20
				Hydroxide (OH)	2016/08/25	NC		%	20
	8376231	MA4	Spiked Blank	Conductivity	2016/08/25		100	%	90 - 110
	8376231	MA4	Method Blank	Conductivity	2016/08/25	<1.0		uS/cm	
	8376231	MA4	RPD [PI7092-01]	Conductivity	2016/08/25	0.23		%	20
	8376232	MA4	Matrix Spike [PI7092-01]	Dissolved Fluoride (F)	2016/08/25		103	%	80 - 120
	8376232	MA4	Spiked Blank	Dissolved Fluoride (F)	2016/08/25		98	%	80 - 120
	8376232	MA4	Method Blank	Dissolved Fluoride (F)	2016/08/25	<0.050		mg/L	
	8376232	MA4	RPD [PI7092-01]	Dissolved Fluoride (F)	2016/08/25	0.51		%	20
	8376462	CH7	Matrix Spike	Dissolved Chloride (Cl)	2016/08/25		106	%	80 - 120
	8376462	CH7	Spiked Blank	Dissolved Chloride (Cl)	2016/08/25		103	%	80 - 120
	8376462	CH7	Method Blank	Dissolved Chloride (Cl)	2016/08/25	<1.0		mg/L	
	8376462	CH7	RPD	Dissolved Chloride (Cl)	2016/08/25	NC		%	20
	8376471	CH7	Matrix Spike	Dissolved Sulphate (SO4)	2016/08/25		NC	%	80 - 120
	8376471	CH7	Spiked Blank	Dissolved Sulphate (SO4)	2016/08/25		112	%	80 - 120
	8376471	CH7	Method Blank	Dissolved Sulphate (SO4)	2016/08/25	<1.0		mg/L	
	8376471	CH7	RPD	Dissolved Sulphate (SO4)	2016/08/25	12		%	20
	8376885	LMD	Matrix Spike	Dissolved Nitrite (N)	2016/08/25		100	%	80 - 120
				Dissolved Nitrate (N)	2016/08/25		103	%	80 - 120
	8376885	LMD	Spiked Blank	Dissolved Nitrite (N)	2016/08/25		99	%	80 - 120
				Dissolved Nitrate (N)	2016/08/25		101	%	80 - 120
	8376885	LMD	Method Blank	Dissolved Nitrite (N)	2016/08/25	<0.010		mg/L	
				Dissolved Nitrate (N)	2016/08/25	<0.010		mg/L	
	8376885	LMD	RPD	Dissolved Nitrite (N)	2016/08/25	NC		%	20
				Dissolved Nitrate (N)	2016/08/25	NC		%	20
	8377393	AL2	Matrix Spike	Total Hex. Chromium (Cr 6+)	2016/08/26		98	%	80 - 120
	8377393	AL2	Spiked Blank	Total Hex. Chromium (Cr 6+)	2016/08/26		108	%	80 - 120
	8377393	AL2	Method Blank	Total Hex. Chromium (Cr 6+)	2016/08/26	0.0010, RDL=0.0010		mg/L	
	8377393	AL2	RPD	Total Hex. Chromium (Cr 6+)	2016/08/26	NC		%	20
	8377550	MPH	Matrix Spike [PI7088-02]	Total Suspended Solids	2016/08/29		87	%	80 - 120
	8377550	MPH	Spiked Blank	Total Suspended Solids	2016/08/29		100	%	80 - 120
	8377550	MPH	Method Blank	Total Suspended Solids	2016/08/29	<1.0		mg/L	
	8377550	MPH	RPD	Total Suspended Solids	2016/08/29	15		%	20
	8377580	CH7	Matrix Spike	Dissolved Chloride (Cl)	2016/08/26		NC	%	80 - 120
	8377580	CH7	Spiked Blank	Dissolved Chloride (Cl)	2016/08/26		101	%	80 - 120
	8377580	CH7	Method Blank	Dissolved Chloride (Cl)	2016/08/26	<1.0		mg/L	

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8377580	CH7	RPD		Dissolved Chloride (Cl)	2016/08/26	0.052		%	20
8377613	CH7	Matrix Spike		Dissolved Sulphate (SO4)	2016/08/26		NC	%	80 - 120
8377613	CH7	Spiked Blank		Dissolved Sulphate (SO4)	2016/08/26		104	%	80 - 120
8377613	CH7	Method Blank		Dissolved Sulphate (SO4)	2016/08/26	<1.0		mg/L	
8377613	CH7	RPD		Dissolved Sulphate (SO4)	2016/08/26	4.2		%	20
8377616	GM4	Matrix Spike		Total Suspended Solids	2016/08/26		97	%	80 - 120
8377616	GM4	Spiked Blank		Total Suspended Solids	2016/08/26		90	%	80 - 120
8377616	GM4	Method Blank		Total Suspended Solids	2016/08/26	<1.0		mg/L	
8377616	GM4	RPD		Total Suspended Solids	2016/08/26	15		%	20
8377619	KPG	Spiked Blank		True Colour	2016/08/25		101	%	80 - 120
8377619	KPG	Method Blank		True Colour	2016/08/25	<2.0		PtCo unit	
8377619	KPG	RPD [PI7088-01]		True Colour	2016/08/25	5.4		%	20
8377620	CH7	Matrix Spike		Dissolved Chloride (Cl)	2016/08/26		110	%	80 - 120
8377620	CH7	Spiked Blank		Dissolved Chloride (Cl)	2016/08/26		101	%	80 - 120
8377620	CH7	Method Blank		Dissolved Chloride (Cl)	2016/08/26	<1.0		mg/L	
8377620	CH7	RPD		Dissolved Chloride (Cl)	2016/08/26	NC		%	20
8377633	CH7	Matrix Spike		Dissolved Sulphate (SO4)	2016/08/26		NC	%	80 - 120
8377633	CH7	Spiked Blank		Dissolved Sulphate (SO4)	2016/08/26		104	%	80 - 120
8377633	CH7	Method Blank		Dissolved Sulphate (SO4)	2016/08/26	<1.0		mg/L	
8377633	CH7	RPD		Dissolved Sulphate (SO4)	2016/08/26	1.2		%	20
8377790	JLO	Matrix Spike		Dissolved Mercury (Hg)	2016/08/26		95	%	85 - 115
8377790	JLO	QC Standard		Dissolved Mercury (Hg)	2016/08/26		104	%	85 - 115
8377790	JLO	Spiked Blank		Dissolved Mercury (Hg)	2016/08/26		99	%	85 - 115
8377790	JLO	Method Blank		Dissolved Mercury (Hg)	2016/08/26	<0.0020		ug/L	
8377790	JLO	RPD		Dissolved Mercury (Hg)	2016/08/26	NC		%	20
8377810	JLO	Matrix Spike [PI7088-07]		Total Mercury (Hg)	2016/08/26		97	%	85 - 115
8377810	JLO	QC Standard		Total Mercury (Hg)	2016/08/26		110	%	85 - 115
8377810	JLO	Spiked Blank		Total Mercury (Hg)	2016/08/26		104	%	85 - 115
8377810	JLO	Method Blank		Total Mercury (Hg)	2016/08/26	<0.0020		ug/L	
8377810	JLO	RPD [PI7088-07]		Total Mercury (Hg)	2016/08/26	NC		%	20
8378619	MPH	Matrix Spike		Total Dissolved Solids	2016/08/27		101	%	80 - 120
8378619	MPH	Spiked Blank		Total Dissolved Solids	2016/08/27		101	%	80 - 120
8378619	MPH	Method Blank		Total Dissolved Solids	2016/08/27	<10		mg/L	
8378619	MPH	RPD		Total Dissolved Solids	2016/08/27	1.8		%	20
8379456	KPG	Spiked Blank		True Colour	2016/08/27		101	%	80 - 120
8379456	KPG	Method Blank		True Colour	2016/08/27	<2.0		PtCo unit	
8379456	KPG	RPD		True Colour	2016/08/27	1.4		%	20
8379589	JR1	Matrix Spike		O-TERPHENYL (sur.)	2016/08/29		101	%	50 - 130
				F2 (C10-C16 Hydrocarbons)	2016/08/29		101	%	50 - 130
				F3 (C16-C34 Hydrocarbons)	2016/08/29		101	%	50 - 130
				F4 (C34-C50 Hydrocarbons)	2016/08/29		94	%	50 - 130
8379589	JR1	Spiked Blank		O-TERPHENYL (sur.)	2016/08/29		98	%	50 - 130
				F2 (C10-C16 Hydrocarbons)	2016/08/29		100	%	70 - 130
				F3 (C16-C34 Hydrocarbons)	2016/08/29		99	%	70 - 130
				F4 (C34-C50 Hydrocarbons)	2016/08/29		92	%	70 - 130
8379589	JR1	Method Blank		O-TERPHENYL (sur.)	2016/08/29		100	%	50 - 130
				F2 (C10-C16 Hydrocarbons)	2016/08/29	<0.10		mg/L	
				F3 (C16-C34 Hydrocarbons)	2016/08/29	<0.20		mg/L	
				F4 (C34-C50 Hydrocarbons)	2016/08/29	<0.20		mg/L	
8379589	JR1	RPD		F2 (C10-C16 Hydrocarbons)	2016/08/29	NC		%	40
				F3 (C16-C34 Hydrocarbons)	2016/08/29	NC		%	40
				F4 (C34-C50 Hydrocarbons)	2016/08/29	NC		%	40

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8380464	SES	Matrix Spike		1,4-Difluorobenzene (sur.)	2016/08/29		96	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/29		99	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/29		107	%	70 - 130
				Benzene	2016/08/29		103	%	70 - 130
				Toluene	2016/08/29		97	%	70 - 130
				Ethylbenzene	2016/08/29		104	%	70 - 130
				m & p-Xylene	2016/08/29		101	%	70 - 130
				o-Xylene	2016/08/29		100	%	70 - 130
				F1 (C6-C10)	2016/08/29		86	%	70 - 130
8380464	SES	Spiked Blank		1,4-Difluorobenzene (sur.)	2016/08/29		96	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/29		97	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/29		105	%	70 - 130
				Benzene	2016/08/29		98	%	70 - 130
				Toluene	2016/08/29		94	%	70 - 130
				Ethylbenzene	2016/08/29		98	%	70 - 130
				m & p-Xylene	2016/08/29		94	%	70 - 130
				o-Xylene	2016/08/29		94	%	70 - 130
				F1 (C6-C10)	2016/08/29		100	%	70 - 130
8380464	SES	Method Blank		1,4-Difluorobenzene (sur.)	2016/08/29		98	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/29		100	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/29		102	%	70 - 130
				Benzene	2016/08/29	<0.40		ug/L	
				Toluene	2016/08/29	<0.40		ug/L	
				Ethylbenzene	2016/08/29	<0.40		ug/L	
				m & p-Xylene	2016/08/29	<0.80		ug/L	
				o-Xylene	2016/08/29	<0.40		ug/L	
				Xylenes (Total)	2016/08/29	<0.80		ug/L	
				F1 (C6-C10) - BTEX	2016/08/29	<100		ug/L	
8380464	SES	RPD		F1 (C6-C10)	2016/08/29	<100		ug/L	
				Benzene	2016/08/29	NC		%	40
				Toluene	2016/08/29	NC		%	40
				Ethylbenzene	2016/08/29	NC		%	40
				m & p-Xylene	2016/08/29	NC		%	40
				o-Xylene	2016/08/29	NC		%	40
				Xylenes (Total)	2016/08/29	NC		%	40
				F1 (C6-C10) - BTEX	2016/08/29	NC		%	40
				F1 (C6-C10)	2016/08/29	NC		%	40
8380615	HG3	Matrix Spike		1,4-Difluorobenzene (sur.)	2016/08/30		94	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/30		95	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/30		100	%	70 - 130
				Benzene	2016/08/30		98	%	70 - 130
				Toluene	2016/08/30		86	%	70 - 130
				Ethylbenzene	2016/08/30		NC	%	70 - 130
				o-Xylene	2016/08/30		NC	%	70 - 130
				F1 (C6-C10)	2016/08/30		NC	%	70 - 130
8380615	HG3	Spiked Blank		1,4-Difluorobenzene (sur.)	2016/08/30		97	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/30		93	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/30		101	%	70 - 130
				Benzene	2016/08/30		102	%	70 - 130
				Toluene	2016/08/30		90	%	70 - 130
				Ethylbenzene	2016/08/30		96	%	70 - 130
				m & p-Xylene	2016/08/30		95	%	70 - 130

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8380615	HG3	Method Blank		o-Xylene	2016/08/30		96	%	70 - 130
				F1 (C6-C10)	2016/08/30		101	%	70 - 130
				1,4-Difluorobenzene (sur.)	2016/08/30		96	%	70 - 130
				4-Bromofluorobenzene (sur.)	2016/08/30		92	%	70 - 130
				D4-1,2-Dichloroethane (sur.)	2016/08/30		97	%	70 - 130
				Benzene	2016/08/30	<0.40		ug/L	
				Toluene	2016/08/30	<0.40		ug/L	
				Ethylbenzene	2016/08/30	<0.40		ug/L	
				m & p-Xylene	2016/08/30	<0.80		ug/L	
				o-Xylene	2016/08/30	<0.40		ug/L	
				Xylenes (Total)	2016/08/30	<0.80		ug/L	
				F1 (C6-C10) - BTEX	2016/08/30	<100		ug/L	
				F1 (C6-C10)	2016/08/30	<100		ug/L	
8380615	HG3	RPD		Benzene	2016/08/30	6.3		%	40
				Toluene	2016/08/30	6.1		%	40
				Ethylbenzene	2016/08/30	6.8		%	40
				m & p-Xylene	2016/08/30	7.0		%	40
				o-Xylene	2016/08/30	6.7		%	40
				Xylenes (Total)	2016/08/30	6.9		%	40
				F1 (C6-C10) - BTEX	2016/08/30	4.1		%	40
				F1 (C6-C10)	2016/08/30	0.99		%	40
8381251	APY	Matrix Spike		Total Aluminum (Al)	2016/08/30		95	%	80 - 120
				Total Antimony (Sb)	2016/08/30		113	%	80 - 120
				Total Arsenic (As)	2016/08/30		110	%	80 - 120
				Total Beryllium (Be)	2016/08/30		106	%	80 - 120
				Total Chromium (Cr)	2016/08/30		110	%	80 - 120
				Total Cobalt (Co)	2016/08/30		106	%	80 - 120
				Total Copper (Cu)	2016/08/30		103	%	80 - 120
				Total Lead (Pb)	2016/08/30		106	%	80 - 120
				Total Molybdenum (Mo)	2016/08/30		118	%	80 - 120
				Total Nickel (Ni)	2016/08/30		106	%	80 - 120
				Total Selenium (Se)	2016/08/30		NC	%	80 - 120
				Total Silver (Ag)	2016/08/30		107	%	80 - 120
				Total Thallium (Tl)	2016/08/30		105	%	80 - 120
				Total Tin (Sn)	2016/08/30		119	%	80 - 120
				Total Titanium (Ti)	2016/08/30		108	%	80 - 120
				Total Uranium (U)	2016/08/30		108	%	80 - 120
				Total Vanadium (V)	2016/08/30		112	%	80 - 120
				Total Zinc (Zn)	2016/08/30		NC	%	80 - 120
8381251	APY	Spiked Blank		Total Aluminum (Al)	2016/08/30		96	%	80 - 120
				Total Antimony (Sb)	2016/08/30		100	%	80 - 120
				Total Arsenic (As)	2016/08/30		105	%	80 - 120
				Total Beryllium (Be)	2016/08/30		96	%	80 - 120
				Total Chromium (Cr)	2016/08/30		106	%	80 - 120
				Total Cobalt (Co)	2016/08/30		104	%	80 - 120
				Total Copper (Cu)	2016/08/30		105	%	80 - 120
				Total Lead (Pb)	2016/08/30		103	%	80 - 120
				Total Molybdenum (Mo)	2016/08/30		107	%	80 - 120
				Total Nickel (Ni)	2016/08/30		104	%	80 - 120
				Total Selenium (Se)	2016/08/30		101	%	80 - 120
				Total Silver (Ag)	2016/08/30		102	%	80 - 120
				Total Thallium (Tl)	2016/08/30		102	%	80 - 120

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8381251	APY	Method Blank		Total Tin (Sn)	2016/08/30		108	%	80 - 120
				Total Titanium (Ti)	2016/08/30		106	%	80 - 120
				Total Uranium (U)	2016/08/30		101	%	80 - 120
				Total Vanadium (V)	2016/08/30		107	%	80 - 120
				Total Zinc (Zn)	2016/08/30		103	%	80 - 120
				Total Aluminum (Al)	2016/08/30	0.0037, RDL=0.0030		mg/L	
				Total Antimony (Sb)	2016/08/30	<0.00060		mg/L	
				Total Arsenic (As)	2016/08/30	<0.00020		mg/L	
				Total Beryllium (Be)	2016/08/30	<0.0010		mg/L	
				Total Chromium (Cr)	2016/08/30	<0.0010		mg/L	
				Total Cobalt (Co)	2016/08/30	<0.00030		mg/L	
				Total Copper (Cu)	2016/08/30	<0.00020		mg/L	
				Total Lead (Pb)	2016/08/30	<0.00020		mg/L	
				Total Molybdenum (Mo)	2016/08/30	<0.00020		mg/L	
				Total Nickel (Ni)	2016/08/30	<0.00050		mg/L	
				Total Selenium (Se)	2016/08/30	<0.00020		mg/L	
				Total Silver (Ag)	2016/08/30	<0.00010		mg/L	
				Total Thallium (Tl)	2016/08/30	<0.00020		mg/L	
				Total Tin (Sn)	2016/08/30	<0.0010		mg/L	
				Total Titanium (Ti)	2016/08/30	<0.0010		mg/L	
8381251	APY	RPD		Total Uranium (U)	2016/08/30	<0.00010		mg/L	
				Total Vanadium (V)	2016/08/30	<0.0010		mg/L	
8381254	CJ5	Matrix Spike		Total Zinc (Zn)	2016/08/30	<0.0030		mg/L	
				Total Selenium (Se)	2016/08/30	4.5		%	20
				Total Barium (Ba)	2016/08/30		98	%	80 - 120
				Total Boron (B)	2016/08/30		105	%	80 - 120
				Total Calcium (Ca)	2016/08/30		NC	%	80 - 120
				Total Iron (Fe)	2016/08/30		101	%	80 - 120
				Total Lithium (Li)	2016/08/30		103	%	80 - 120
				Total Magnesium (Mg)	2016/08/30		101	%	80 - 120
				Total Manganese (Mn)	2016/08/30		99	%	80 - 120
				Total Phosphorus (P)	2016/08/30		95	%	80 - 120
				Total Potassium (K)	2016/08/30		105	%	80 - 120
				Total Silicon (Si)	2016/08/30		98	%	80 - 120
				Total Sodium (Na)	2016/08/30		100	%	80 - 120
				Total Strontium (Sr)	2016/08/30		97	%	80 - 120
8381254	CJ5	Spiked Blank		Total Barium (Ba)	2016/08/30		98	%	80 - 120
				Total Boron (B)	2016/08/30		104	%	80 - 120
				Total Calcium (Ca)	2016/08/30		100	%	80 - 120
				Total Iron (Fe)	2016/08/30		101	%	80 - 120
				Total Lithium (Li)	2016/08/30		101	%	80 - 120
				Total Magnesium (Mg)	2016/08/30		101	%	80 - 120
				Total Manganese (Mn)	2016/08/30		99	%	80 - 120
				Total Phosphorus (P)	2016/08/30		96	%	80 - 120
				Total Potassium (K)	2016/08/30		104	%	80 - 120
				Total Silicon (Si)	2016/08/30		98	%	80 - 120
				Total Sodium (Na)	2016/08/30		101	%	80 - 120
				Total Strontium (Sr)	2016/08/30		98	%	80 - 120
8381254	CJ5	Method Blank		Total Sulphur (S)	2016/08/30		101	%	80 - 120
				Total Barium (Ba)	2016/08/30	<0.010		mg/L	
				Total Boron (B)	2016/08/30	<0.020		mg/L	

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8381254	CJ5	RPD [PI7088-05]	Total Calcium (Ca)	2016/08/30	<0.30			mg/L	
			Total Iron (Fe)	2016/08/30	<0.060			mg/L	
			Total Lithium (Li)	2016/08/30	<0.020			mg/L	
			Total Magnesium (Mg)	2016/08/30	<0.20			mg/L	
			Total Manganese (Mn)	2016/08/30	<0.0040			mg/L	
			Total Phosphorus (P)	2016/08/30	<0.10			mg/L	
			Total Potassium (K)	2016/08/30	<0.30			mg/L	
			Total Silicon (Si)	2016/08/30	<0.10			mg/L	
			Total Sodium (Na)	2016/08/30	<0.50			mg/L	
			Total Strontium (Sr)	2016/08/30	<0.020			mg/L	
			Total Sulphur (S)	2016/08/30	<0.20			mg/L	
			Total Barium (Ba)	2016/08/30	NC			%	20
			Total Boron (B)	2016/08/30	NC			%	20
			Total Calcium (Ca)	2016/08/30	0.12			%	20
			Total Iron (Fe)	2016/08/30	NC			%	20
			Total Lithium (Li)	2016/08/30	0.093			%	20
			Total Magnesium (Mg)	2016/08/30	0.0055			%	20
			Total Manganese (Mn)	2016/08/30	1.2			%	20
			Total Phosphorus (P)	2016/08/30	NC			%	20
			Total Potassium (K)	2016/08/30	0.034			%	20
8381795	APY	Matrix Spike [PI7088-06]	Total Silicon (Si)	2016/08/30	0.80			%	20
			Total Sodium (Na)	2016/08/30	0.72			%	20
			Total Strontium (Sr)	2016/08/30	0.28			%	20
			Total Sulphur (S)	2016/08/30	0.42			%	20
			Dissolved Aluminum (Al)	2016/08/30		93		%	80 - 120
			Dissolved Antimony (Sb)	2016/08/30		103		%	80 - 120
			Dissolved Arsenic (As)	2016/08/30		103		%	80 - 120
			Dissolved Beryllium (Be)	2016/08/30		98		%	80 - 120
			Dissolved Chromium (Cr)	2016/08/30		99		%	80 - 120
			Dissolved Cobalt (Co)	2016/08/30		95		%	80 - 120
			Dissolved Copper (Cu)	2016/08/30		92		%	80 - 120
			Dissolved Lead (Pb)	2016/08/30		99		%	80 - 120
			Dissolved Molybdenum (Mo)	2016/08/30		NC		%	80 - 120
			Dissolved Nickel (Ni)	2016/08/30		NC		%	80 - 120
			Dissolved Selenium (Se)	2016/08/30		97		%	80 - 120
			Dissolved Silver (Ag)	2016/08/30		95		%	80 - 120
			Dissolved Thallium (Tl)	2016/08/30		97		%	80 - 120
			Dissolved Tin (Sn)	2016/08/30		114		%	80 - 120
			Dissolved Titanium (Ti)	2016/08/30		108		%	80 - 120
			Dissolved Uranium (U)	2016/08/30		NC		%	80 - 120
8381795	APY	Spiked Blank	Dissolved Vanadium (V)	2016/08/30		103		%	80 - 120
			Dissolved Zinc (Zn)	2016/08/30		103		%	80 - 120
			Dissolved Aluminum (Al)	2016/08/30		97		%	80 - 120
			Dissolved Antimony (Sb)	2016/08/30		94		%	80 - 120
			Dissolved Arsenic (As)	2016/08/30		103		%	80 - 120
			Dissolved Beryllium (Be)	2016/08/30		99		%	80 - 120
			Dissolved Chromium (Cr)	2016/08/30		105		%	80 - 120
			Dissolved Cobalt (Co)	2016/08/30		103		%	80 - 120
			Dissolved Copper (Cu)	2016/08/30		101		%	80 - 120
			Dissolved Lead (Pb)	2016/08/30		102		%	80 - 120
			Dissolved Molybdenum (Mo)	2016/08/30		105		%	80 - 120
			Dissolved Nickel (Ni)	2016/08/30		102		%	80 - 120

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8381795	APY	Method Blank		Dissolved Selenium (Se)	2016/08/30		102	%	80 - 120
				Dissolved Silver (Ag)	2016/08/30		101	%	80 - 120
				Dissolved Thallium (Tl)	2016/08/30		101	%	80 - 120
				Dissolved Tin (Sn)	2016/08/30		109	%	80 - 120
				Dissolved Titanium (Ti)	2016/08/30		105	%	80 - 120
				Dissolved Uranium (U)	2016/08/30		101	%	80 - 120
				Dissolved Vanadium (V)	2016/08/30		106	%	80 - 120
				Dissolved Zinc (Zn)	2016/08/30		104	%	80 - 120
				Dissolved Aluminum (Al)	2016/08/30	<0.0030		mg/L	
				Dissolved Antimony (Sb)	2016/08/30	<0.00060		mg/L	
				Dissolved Arsenic (As)	2016/08/30	<0.00020		mg/L	
				Dissolved Beryllium (Be)	2016/08/30	<0.0010		mg/L	
				Dissolved Chromium (Cr)	2016/08/30	<0.0010		mg/L	
				Dissolved Cobalt (Co)	2016/08/30	<0.00030		mg/L	
				Dissolved Copper (Cu)	2016/08/30	<0.00020		mg/L	
				Dissolved Lead (Pb)	2016/08/30	<0.00020		mg/L	
				Dissolved Molybdenum (Mo)	2016/08/30	<0.00020		mg/L	
				Dissolved Nickel (Ni)	2016/08/30	<0.00050		mg/L	
				Dissolved Selenium (Se)	2016/08/30	<0.00020		mg/L	
				Dissolved Silver (Ag)	2016/08/30	<0.00010		mg/L	
8381795	APY	RPD [PI7088-06]		Dissolved Thallium (Tl)	2016/08/30	<0.00020		mg/L	
				Dissolved Tin (Sn)	2016/08/30	<0.0010		mg/L	
				Dissolved Titanium (Ti)	2016/08/30	<0.0010		mg/L	
				Dissolved Uranium (U)	2016/08/30	<0.00010		mg/L	
				Dissolved Vanadium (V)	2016/08/30	<0.0010		mg/L	
				Dissolved Zinc (Zn)	2016/08/30	<0.0030		mg/L	
				Dissolved Aluminum (Al)	2016/08/30	NC		%	20
				Dissolved Antimony (Sb)	2016/08/30	NC		%	20
				Dissolved Arsenic (As)	2016/08/30	4.8		%	20
				Dissolved Beryllium (Be)	2016/08/30	NC		%	20
				Dissolved Chromium (Cr)	2016/08/30	NC		%	20
				Dissolved Cobalt (Co)	2016/08/30	NC		%	20
				Dissolved Copper (Cu)	2016/08/30	7.2		%	20
				Dissolved Lead (Pb)	2016/08/30	NC		%	20
				Dissolved Molybdenum (Mo)	2016/08/30	0.091		%	20
				Dissolved Nickel (Ni)	2016/08/30	1.3		%	20
				Dissolved Selenium (Se)	2016/08/30	21 (1)		%	20
				Dissolved Silver (Ag)	2016/08/30	NC		%	20
				Dissolved Thallium (Tl)	2016/08/30	NC		%	20
				Dissolved Tin (Sn)	2016/08/30	NC		%	20
8382195	CJ5	Matrix Spike [PI7089-06]		Dissolved Titanium (Ti)	2016/08/30	NC		%	20
				Dissolved Uranium (U)	2016/08/30	0.21		%	20
				Dissolved Vanadium (V)	2016/08/30	NC		%	20
				Dissolved Zinc (Zn)	2016/08/30	NC		%	20
				Dissolved Barium (Ba)	2016/08/30		95	%	80 - 120
				Dissolved Boron (B)	2016/08/30		104	%	80 - 120
				Dissolved Calcium (Ca)	2016/08/30		NC	%	80 - 120
				Dissolved Iron (Fe)	2016/08/30		98	%	80 - 120
				Dissolved Lithium (Li)	2016/08/30		98	%	80 - 120
				Dissolved Magnesium (Mg)	2016/08/30		NC	%	80 - 120
8382195	CJ5	Matrix Spike [PI7089-06]		Dissolved Manganese (Mn)	2016/08/30		93	%	80 - 120
				Dissolved Phosphorus (P)	2016/08/30		97	%	80 - 120

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8382195	CJ5	Spiked Blank		Dissolved Potassium (K)	2016/08/30		100	%	80 - 120
				Dissolved Silicon (Si)	2016/08/30		99	%	80 - 120
				Dissolved Sodium (Na)	2016/08/30		NC	%	80 - 120
				Dissolved Strontium (Sr)	2016/08/30		92	%	80 - 120
				Dissolved Barium (Ba)	2016/08/30		94	%	80 - 120
				Dissolved Boron (B)	2016/08/30		104	%	80 - 120
				Dissolved Calcium (Ca)	2016/08/30		96	%	80 - 120
				Dissolved Iron (Fe)	2016/08/30		99	%	80 - 120
				Dissolved Lithium (Li)	2016/08/30		97	%	80 - 120
				Dissolved Magnesium (Mg)	2016/08/30		101	%	80 - 120
				Dissolved Manganese (Mn)	2016/08/30		96	%	80 - 120
				Dissolved Phosphorus (P)	2016/08/30		98	%	80 - 120
				Dissolved Potassium (K)	2016/08/30		100	%	80 - 120
				Dissolved Silicon (Si)	2016/08/30		100	%	80 - 120
				Dissolved Sodium (Na)	2016/08/30		95	%	80 - 120
				Dissolved Strontium (Sr)	2016/08/30		94	%	80 - 120
8382195	CJ5	Method Blank		Dissolved Sulphur (S)	2016/08/30		101	%	80 - 120
				Dissolved Barium (Ba)	2016/08/30	<0.010		mg/L	
				Dissolved Boron (B)	2016/08/30	<0.020		mg/L	
				Dissolved Calcium (Ca)	2016/08/30	<0.30		mg/L	
				Dissolved Iron (Fe)	2016/08/30	<0.060		mg/L	
				Dissolved Lithium (Li)	2016/08/30	<0.020		mg/L	
				Dissolved Magnesium (Mg)	2016/08/30	<0.20		mg/L	
				Dissolved Manganese (Mn)	2016/08/30	<0.0040		mg/L	
				Dissolved Phosphorus (P)	2016/08/30	<0.10		mg/L	
				Dissolved Potassium (K)	2016/08/30	<0.30		mg/L	
				Dissolved Silicon (Si)	2016/08/30	<0.10		mg/L	
				Dissolved Sodium (Na)	2016/08/30	<0.50		mg/L	
				Dissolved Strontium (Sr)	2016/08/30	<0.020		mg/L	
				Dissolved Sulphur (S)	2016/08/30	<0.20		mg/L	
8382195	CJ5	RPD [PI7089-06]		Dissolved Barium (Ba)	2016/08/30	NC		%	20
				Dissolved Boron (B)	2016/08/30	NC		%	20
				Dissolved Calcium (Ca)	2016/08/30	0.11		%	20
				Dissolved Iron (Fe)	2016/08/30	NC		%	20
				Dissolved Lithium (Li)	2016/08/30	NC		%	20
				Dissolved Magnesium (Mg)	2016/08/30	0.22		%	20
				Dissolved Manganese (Mn)	2016/08/30	0.070		%	20
				Dissolved Phosphorus (P)	2016/08/30	NC		%	20
				Dissolved Potassium (K)	2016/08/30	0.071		%	20
				Dissolved Silicon (Si)	2016/08/30	0.49		%	20
				Dissolved Sodium (Na)	2016/08/30	0.68		%	20
				Dissolved Strontium (Sr)	2016/08/30	0.12		%	20

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
				Dissolved Sulphur (S)	2016/08/30	0.44		%	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. Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency. NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration). NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL). (1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.									

Maxxam Job #: B672114
Report Date: 2016/08/31

ARCADIS Canada
Client Project #: CAM-D
Your P.O. #: 100347-001
Sampler Initials: EH, JM, KL

VALIDATION SIGNATURE PAGE

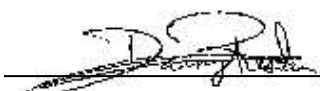
The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).



Amanda Dwyer, Project Manager Assistant



Anna Koksharova, M.Sc., Organics Senior Analyst



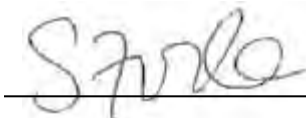
Daniel Reslan, cCT, QP, Organics Supervisor



Justin Geisel, B.Sc., Organics Supervisor



Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Senior Analyst



Suwan Fock, B.Sc., QP, Inorganics Senior Analyst

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Maxxam Analytics International Corporation o/a Maxxam Analytics

Your P.O. #: N/A
Your Project #: B672114
Your C.O.C. #: na

Attention:Parminder Virk

Maxxam Analytics
2021 41st Ave NE
Calgary, AB
T2E 6P2

Report Date: 2016/08/31

Report #: R4149023

Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6I0899

Received: 2016/08/25, 10:40

Sample Matrix: Water
Samples Received: 5

Analyses	Date		Date Analyzed	Laboratory Method	Reference
	Quantity	Extracted			
Polychlorinated Biphenyl in Water	1	2016/08/26	2016/08/26	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Water	1	2016/08/26	2016/08/27	CAM SOP-00309	EPA 8082A m
Polychlorinated Biphenyl in Water	3	2016/08/26	2016/08/29	CAM SOP-00309	EPA 8082A m

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.

Encryption Key

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

Andrea Rieth, Project Manager

Email: ARieth@maxxam.ca

Phone# (905)817-5806

=====

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POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		CYI605	CYI606	CYI607	CYI607		
Sampling Date		2016/08/20 16:30	2016/08/20 14:10	2016/08/20 15:30	2016/08/20 15:30		
COC Number		na	na	na	na		
	UNITS	PI7088\CAM-D MW01	PI7089\CAM-D MW02	PI7090\CAM-D MW03	PI7090\CAM-D MW03 Lab-Dup	RDL	QC Batch
PCBs							
Aroclor 1016	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1221	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1232	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1242	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1248	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1254	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1260	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1262	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Aroclor 1268	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Total PCB	ug/L	<0.05	<0.05	<0.05	<0.05	0.05	4636899
Surrogate Recovery (%)							
Decachlorobiphenyl	%	63	88	80	90	N/A	4636899
RDL = Reportable Detection Limit QC Batch = Quality Control Batch Lab-Dup = Laboratory Initiated Duplicate N/A = Not Applicable							

POLYCHLORINATED BIPHENYLS BY GC-ECD (WATER)

Maxxam ID		CYI608	CYI609		
Sampling Date		2016/08/20 16:10	2016/08/20		
COC Number		na	na		
	UNITS	PI7091\CAM-D MW04	PI7092\CAM-D DUP	RDL	QC Batch
PCBs					
Aroclor 1016	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1221	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1232	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1242	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1248	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1254	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1260	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1262	ug/L	<0.05	<0.05	0.05	4636899
Aroclor 1268	ug/L	<0.05	<0.05	0.05	4636899
Total PCB	ug/L	<0.05	<0.05	0.05	4636899
Surrogate Recovery (%)					
Decachlorobiphenyl	%	97	121	N/A	4636899
RDL = Reportable Detection Limit QC Batch = Quality Control Batch N/A = Not Applicable					

TEST SUMMARY

Maxxam ID: CYI605
Sample ID: PI7088\CAM-D MW01
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/29	Dawn Alarie

Maxxam ID: CYI606
Sample ID: PI7089\CAM-D MW02
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/27	Dawn Alarie

Maxxam ID: CYI607
Sample ID: PI7090\CAM-D MW03
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/26	Dawn Alarie

Maxxam ID: CYI607 Dup
Sample ID: PI7090\CAM-D MW03
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/26	Dawn Alarie

Maxxam ID: CYI608
Sample ID: PI7091\CAM-D MW04
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/29	Dawn Alarie

Maxxam ID: CYI609
Sample ID: PI7092\CAM-D DUP
Matrix: Water

Collected: 2016/08/20
Shipped:
Received: 2016/08/25

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Polychlorinated Biphenyl in Water	GC/ECD	4636899	2016/08/26	2016/08/29	Dawn Alarie

GENERAL COMMENTS

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

Package 1	8.7°C
Package 2	9.3°C

Results relate only to the items tested.

QUALITY ASSURANCE REPORT

QA/QC	Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4636899	DH	Matrix Spike		Decachlorobiphenyl	2016/08/27		87	%	60 - 130
				Aroclor 1260	2016/08/27		87	%	60 - 130
				Total PCB	2016/08/27		87	%	60 - 130
4636899	DH	Spiked Blank		Decachlorobiphenyl	2016/08/26		95	%	60 - 130
				Aroclor 1260	2016/08/26		83	%	60 - 130
				Total PCB	2016/08/26		83	%	60 - 130
4636899	DH	Method Blank		Decachlorobiphenyl	2016/08/26		82	%	60 - 130
				Aroclor 1016	2016/08/26	<0.05		ug/L	
				Aroclor 1221	2016/08/26	<0.05		ug/L	
				Aroclor 1232	2016/08/26	<0.05		ug/L	
				Aroclor 1242	2016/08/26	<0.05		ug/L	
				Aroclor 1248	2016/08/26	<0.05		ug/L	
				Aroclor 1254	2016/08/26	<0.05		ug/L	
				Aroclor 1260	2016/08/26	<0.05		ug/L	
				Aroclor 1262	2016/08/26	<0.05		ug/L	
				Aroclor 1268	2016/08/26	<0.05		ug/L	
				Total PCB	2016/08/26	<0.05		ug/L	
				Aroclor 1016	2016/08/26	NC		%	40
				Aroclor 1221	2016/08/26	NC		%	40
4636899	DH	RPD [CYI607-01]		Aroclor 1232	2016/08/26	NC		%	40
				Aroclor 1242	2016/08/26	NC		%	30
				Aroclor 1248	2016/08/26	NC		%	30
				Aroclor 1254	2016/08/26	NC		%	30
				Aroclor 1260	2016/08/26	NC		%	30
				Aroclor 1262	2016/08/26	NC		%	40
				Aroclor 1268	2016/08/26	NC		%	40
				Total PCB	2016/08/26	NC		%	40

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.

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.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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

VALIDATION SIGNATURE PAGE

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

Cristina Carriere

Cristina Carriere, Scientific Services

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APPENDIX C

Groundwater Sampling Logs



Ground Water Sampling Logs

Well ID: MW01
Project Number (Name): 100347-001 (CAM-D LTM)
Depth to Water: 0.494 m btoc
Depth to Bottom of Well: 1.963 m btoc
Volume of Water Purged: 5 L by bailer
Sample Date: Aug. 20, 2016
Sample Time: 4:30 PM
Sample Method: Peristaltic Pump (low flow setup)
Sample Note: Unable to stabilize draw down; well was dewatering at lowest pumping rate.

Time	Water Level (m btoc)	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)
16:45-17:00	-	4.89	2667	6.21	7.65	123.9

Note: Field parameters were collected using a YSI 556 MPS (calibrated by Arcadis field personnel on Aug. 19, 2016) after samples were collected. Field parameter readings stabilized after 15 minutes.

Water Observations: clear, colourless, no odour, and no Sheen
Comments: none

Well ID: MW02
Project Number (Name): 100347-001 (CAM-D LTM)
Depth to Water: 0.834 m btoc
Depth to Bottom of Well: 1.901 m btoc
Volume of Water Purged: 2.4 L
Sample Date: Aug. 20, 2016
Sample Time: 2:10 PM
Sample Method: Peristaltic Pump (low flow setup)
Sample Note: Unable to stabilize draw down; well was dewatering at lowest pumping rate.

Time	Water Level (m btoc)	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)
14:25-14:40	-	4.87	809	4.32	7.11	70.3

Note: Field parameters were collected using a YSI 556 MPS (calibrated by Arcadis field personnel on Aug. 19, 2016) after samples were collected. Field parameter readings stabilized after 15 minutes.

Water Observations: clear, colourless, no odour, and no sheen
Comments: none

Ground Water Sampling Logs

Well ID: MW03
Project Number (Name): 100347-001 (CAM-D LTM)
Depth to Water: 0.752 m btoc
Depth to Bottom of Well: 2.315 m btoc
Volume of Water Purged: 3.8 L
Sample Date: Aug. 20, 2016
Sample Time: 3:30 PM
Sample Method: Peristaltic Pump (low flow setup)
Sample Note: Unable to stabilize draw down; well was dewatering at lowest pumping rate.

Time	Water Level (m btoc)	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)
15:06	0.821	8.82	1110	8.08	7.31	57.7
15:10	0.857	8.36	1128	4.02	7.80	54.7
15:16	0.888	6.62	1114	3.11	7.77	46.2
15:21	0.932	5.52	1113	2.72	7.76	39.1
15:26	0.984	5.52	1113	2.61	7.76	38.9

Note: Field parameters were collected using a YSI 556 MPS (calibrated by Arcadis field personnel on Aug. 19, 2016) before samples were collected.

Water Observations: slightly cloudy, slight light grey colour, no odour, no sheen
Comments: Insufficient space between the top of riser and lid of the stick-up casing prevents use of J-plug

Well ID: MW04
Project Number (Name): 100347-001 (CAM-D LTM)
Depth to Water: 0.846 m btoc
Depth to Bottom of Well: 2.299 m btoc
Volume of Water Purged: 3 L
Sample Date: Aug. 20, 2016
Sample Time: 4:10 PM
Sample Method: Peristaltic Pump (low flow setup)
Sample Note: Unable to stabilize draw down; well was dewatering at lowest pumping rate.

Time	Water Level (m btoc)	Temperature (°C)	Conductivity (µS/cm)	DO (mg/L)	pH	ORP (mV)
16:15-16:30	-	4.6	600	9.7	7.32	79.2

Note: Field parameters were collected using a YSI 556 MPS (calibrated by Arcadis field personnel on Aug. 19, 2016) after samples were collected. Field parameter reading stabilized after 15 minutes.

Water Observations: slightly cloudy, slight light grey colour, no odour, no sheen
Comments: none