Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake Sample ID: TPN
Crew: Jamie K. Kathleen N. Andrade Date: 2019-02-14 Time: 15:49
Weather: Clear sky, light winds
Observations:
UTM Coordinates: 14W Easting: 0635149 Northing: 7212737 Waypoint: TPN-FEB
Total Water Depth: 14 meters Secchi Depth:
Phytoplankton collected?: Yes No Volume Filtered:
Field DUP collected?: Yes No Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0	8.15	42.6	19.05		
2	0.22	8.02	39.1	19.42		
3	0.52	7.94	35.1	18.96		
4	0.66	7.88	33.2	18.40		
5	0.77	7.83	31.8	17.69		
6	0.86	7.77	31.3	16.81		
7	0.93	7.73	30.2	16.28		
8	1.00	7.68	30.1	15.64		
9	1.03	7.63	30.0	15.20		
10	1.08	7.55	31.7	14.90		
11	1.15	7.51	30.7	14.67		
12	1.22	7.45	31.4	14.46		
13	1.44	7.37	30.8	13.73		
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Wally Lake
Sample ID:
Crew: Jamie K / Isabelle C
Date: 2019-02-21
Time: 14:32
Weather: clear skies, light winds
Observations:
UTM Coordinates: 15W
Easting: 0360835
Northing: 7220772
Waypoint:
Total Water Depth: 12.5 meters
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0.12	6.78	67.6	17.15		
2	0.90	6.72	62.6	17.01		
3	2.02	6.67	59.4	16.75		
4	2.47	6.61	56.7	16.27		
5	2.63	6.57	56.0	16.02		
6	2.74	6.51	55.1	15.48		
7	2.80	6.48	55.2	14.67		
8	2.89	6.46	54.7	13.59		
9	2.95	6.43	54.4	11.97		
10	3.01	6.43	55.4	10.40		
11	3.06	6.42	57.3	9.54		
12	3.17	6.42	59.0	8.88		
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Whale tail South
Sample ID: WTS -37
Crew: FANNY L. & JOE A
Date: 2019-03-02
Time: 13:30
Weather: WINDY - low visibility
Observations:

UTM Coordinates: Easting: Northing: Waypoint: WTS-37

Total Water Depth: 56
Secchi Depth: Ø

Phytoplankton collected?: (Yes) No
Volume Filtered: 500ML

Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.88		57.5	17.40	0	
3	1.47	6.36	54	17.72	0	
4	1.92		50.4	17.43	0	
5	2.21		48.6	17.07	0	
6	2.36		47.1	16.47	0	
7	2.46		46	15.50	0	
8	2.54		46.2	14.67	0	
9	2.57		46.5	13.24	0	
10	2.61		48	12.67	0	
11	2.64		49.7	12.05	0	
12	2.67		49.8	10.86	0	
13	2.75		49.6	10.05	0	
14	2.79		51.1	9.54	0	
15	2.90		50.9	8.87	0	
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with NO HEADSPACE.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: * our Eureka probe PH did not work, we took PH at the office with OAKTON from the water treatement plant.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Whaletail South
Sample ID: WTS-38
Crew: FANNY L. & JOE A
Date: 2019-03-02
Time: 15:00
Weather: WINDY - BAD VISIBILITY
Observations:

UTM Coordinates: Easting: Northing: Waypoint: WTS-38
Total Water Depth: 5.90
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.76		57.8	18.09	1.6	
3	1.25	6.52	53.9	17.95	1.1	
4	1.92		53.2	17.94	0	
5	2.15		51.9	17.91	0	
6						
7						
8						
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12						
13						
14						
15						
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18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: * OUR PH DID NOT WORK ON EUREKA probe, taken at the office with OAKTON probe from WTP.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A-20 Sample ID: A20-31

Crew: Fanny L. Sam Q. Date: 2019-03-04 Time: 12:30

Weather:

Observations: SUNNY - 26

UTM Coordinates: Easting: Northing: / Waypoint: /

Total Water Depth: 5.85 Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	/	/	/	/		
1	/	/	/	/		
2	1.27	7.08	22.7	17.68		
3	1.89	6.99	19.6	18.01		
4	2.21	6.93	18.3	17.60		
5	2.27	6.83	17.7	16.88		
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with NO HEADSPACE.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE A-20 Sample ID: A20-32

Crew: Fanny L., SAMQ. Date: 2019-03-04 Time: 13:00

Weather: SUNNY -26

Observations:

UTM Coordinates: Easting: Northing: Waypoint: A20-32

Total Water Depth: Secchi Depth: 8

Phytoplankton collected?: (Yes) No Volume Filtered: 500ML

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.99	6.8	23.2	18.56		
3	1.81	6.69	19.7	19.19		
4	2.17	6.67	18.4	18.68		
5	2.27	6.6	17.6	16.42		
6	2.29	6.53	17.2	16.03		
7	2.3	6.45	17.7	15.03		
8	2.31	6.43	17.9	14.46		
9	2.32	6.38	18.1	14.15		
10	2.34	6.41	18.1	14.06		
11	2.35	6.4	18.1	14.07		
12	2.36	6.42	18.5	14.06		
13	2.37	6.43	18.5	14.22		
14	2.38	6.41	18.5	14.16		
15	2.4	6.4	18.4	14.11		
16	2.43	6.38	17.8	13.91		
17	2.44	6.32	18	13.88		
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: MAM-38
Crew: Fanny & SAMQ
Date: 2019-03-04
Time: 15:40
Weather:
Observations: SUNNY -26°C

UTM Coordinates: Easting: / Northing: / Waypoint: /
Total Water Depth: 6.3
Secchi Depth: X
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ML
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	/	/	/	/		
1	/	/	/	/		
2	1.54	6.43	107.0	16.09		
3	2.26	6.44	100	16.29		
4	2.69	6.43	96.5	16.36		
5	2.79	6.36	95.5	16		
6	2.84	6.29	98	15.27		
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: MAM-37
Crew: Fanny L. Sam Q.
Date: 2019-03-04
Time: 15:15
Weather:
Observations: SUNNY -26°C
UTM Coordinates: Easting: / Northing: / Waypoint: /
Total Water Depth: 8.7
Secchi Depth: X
Phytoplankton collected?: (Yes) No
Volume Filtered: 500mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.97	6.46	179.8	15.27		
3	1.92	6.54	174.8	16.12		
4	2.46	6.52	172.4	16.63		
5	2.79	6.40	180.4	16.07		
6	2.88	6.32	187.4	14.79		
7	2.99	6.28	195.7	13.60		
8	3.74	6.21	210.1	12.38		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

March DUP-3

Area: Nemo Lake
Sample ID: NEM-37
Crew: L.D - N.S
Date: 2019-03-07
Time: 12h18
Weather: -25 cloudy
Observations:
UTM Coordinates: Easting: 0725 7398
Northing: 606220
Waypoint:
Total Water Depth: 9,30
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0,9	7,34	43,5	18,65	} more than 2 m of ICE	
2	0,85	7,25	41,2	18,93		
3	1,78	7,22	36,7	18,68		
4	2,11	7,19	34,2	18,34		
5	2,26	7,15	33,2	17,88		
6	2,37	7,09	32,3	17,42		
7	2,41	6,98	33,6	16,70		
8	2,44	6,89	36,6	16,38		
9	2,53	6,85	37,4	16,47		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Nemo Lake
Sample ID: NEM-38
Crew: LD-NS
Date: 2019-03-07
Time: 13h11
Weather: -25 cloudy
Observations:

UTM Coordinates: Easting: 7257303
Northing: 606559
Waypoint: Ø

Total Water Depth: 5,35
Secchi Depth: Ø

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0	7,29	45,4	18,53	} more than 2M of ICE	
2	0,73	7,20	41,4	18,91		
3	1,32	7,14	35,7	18,44		
4	2	7,11	33,7	18,25		
5	2,05	7,06	32,9	18,26		
6						
7						
8						
9						
10						
11						
12						
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14						
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16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D5 (LK5)
Sample ID: LK5-7
Crew: N.S, K.M
Date: 2019/03/09
Time: 12:30
Weather: -30°C, Sunny
Observations:

UTM Coordinates: Easting: 725 2001 Northing: 6128 29 Waypoint:
Total Water Depth: 8.1
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: /
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.8	7.13	44.5	18.32		
3	1.86	7.07	39.4	18.26		
4	2.61	7.01	36.7	17.47		
5	2.82	6.91	36	16.66		
6	2.88	6.79	36.4	15.11		
7	2.94	6.68	36.9	14.16		
8	2.95	6.60	38.3	13.37		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D5 (LK5)
Sample ID: LK5-8 (LK5)
Crew: N.S, K.M
Date: 2019/03/09
Time: 13:28
Weather: -30°C, Sunny
Observations:
UTM Coordinates: Easting: 612883 Northing: 7 25 2082 Waypoint:
Total Water Depth: 15.2
Secchi Depth: /
Phytoplankton collected?: Yes No
Volume Filtered: /
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.52	7.15	45.6	19.80		
3	1.75	7.06	40.1	19.12		
4	2.57	6.96	37	17.38		
5	2.74	6.90	36	16.80		
6	2.88	6.81	35.2	15.54		
7	2.93	6.71	35.8	12.21		
8	2.96	6.59	35.8	11.31		
9	2.97	6.56	35.8	10.70		
10	2.99	6.53	36.5	9.96		
11	3.02	6.5	37.3	9.43		
12	3.10	6.48	37.7	9.30		
13	3.03	6.45	41.2	9.14		
14	3.05	6.43	42.9	8.81		
15	3.06	6.41	46.6	8.26		
16	3.07	[illegible]	[illegible]	7.73		
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPL
Sample ID: TPS-62
Crew: NS/KN
Date: 2019-03-12
Time: 13:50
Weather: Sunny
Observations:
UTM Coordinates: 14W
Easting: 0633467
Northing: 7208427
Waypoint:
Total Water Depth: 15.70 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.35	7.45	40.5	18.20		
3	0.64	7.49	36.7	16.88		
4	0.77	7.54	34.1	15.90		
5	0.87	7.57	32.9	15.24		
6	0.95	7.60	31.8	14.72		
7	1.01	7.61	31.3	14.58		
8	1.06	7.63	30.9	14.42		
9	1.11	7.66	30.0	14.40		
10	1.14	7.68	29.6	14.47		
11	1.16	7.70	29.8	14.52		
12	1.20	7.72	29.9	14.64		
13	1.24	7.75	29.7	14.77		
14	1.27	7.78	30	15.03		
15	1.27	7.81	30.8	15.32		
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: samples collected.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DI
Sample ID: LK1-7
Crew: L.D - KM
Date: 2019-03-14
Time: 13:50
Weather: -20 cloudy
Observations:
UTM Coordinates: Easting: 7241962 Northing: 6675 48 Waypoint:
Total Water Depth: 9.53 m
Secchi Depth: ∅
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.37	7.11	30.9	16.83	0	
3	1.49	6.77	25.5	17.21	0	
4	2.4	6.36	22.7	16.85	0	
5	2.28	6.0	20.7	16.03	0	
6	2.58	5.69	19.6	15.16	0	
7	2.74	5.34	19.5	14.25	0	
8	2.98	4.92	19.7	12.88	0	
9	3.10	5.47	20.9	10.92	0	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D1
Crew: L.D - KM
Weather: -20 Cloudy
Observations:

Sample ID: LK1-8
Date: 2019-03/14
Time: 13:24

UTM Coordinates: Easting: 724942 Northing: 6071114
Waypoint:
Total Water Depth: 8.27m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
3	1.3	6.64	25.6	17.3	0	
4	1.87	6.85	23.3	17.62	0	
5	2.25	6.87	21.8	17.53	0	
6	2.94	6.85	20.2	16.45	0	
7	3.23	6.76	20.5	15.21	0	
8	3.81	6.65	24	13.28	0	
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D8 Sample ID: LK8-8

Crew: L.D., K.M. Date: 2019-03-15 Time: 15:30

Weather: -26 Sunny

Observations:

UTM Coordinates: Easting: 725 86 34 Northing: 6/0686 Waypoint:

Total Water Depth: 10.15m Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500 mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1			~~23.4~~			
2	1.14	7.94	23.4	12.28		
3	1.82	7.69	18.9	15.22		
4	2.12	7.57	16.9	15.5		
5	2.16	7.4	16.7	15.02		
6	2.18	7.31	17	14.91		
7	2.21	7.21	16.5	14.6		
8	2.23	7.10	16.5	14.16		
9	2.25	6.98	16.6	13.52		
10	2.27	6.86	16.6	13.7		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D8
Sample ID: LK8-7
Crew: L.D - KM
Date: 2019-03-15
Time: 14:50
Weather: -26 Sunny
Observations:
UTM Coordinates: Easting: 7258792 Northing: 6121 10
Waypoint:
Total Water Depth: 14.23m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.70	7.26	26.3	19		
3	1.69	7.16	21.7	19.21		
4	2.08	7.11	18.6	18.88		
5	2.22	7.2	17.3	17.51		
6	2.22	6.94	17.3	16.4		
7	2.23	6.87	17.2	15.29		
8	2.25	6.8	17.1	14.8		
9	2.28	6.49	16.9	12.18		
10	2.31	6.5	17	12.6		
11	2.37	6.52	17.4	13.01		
12	2.48	6.52	17.5	13.26		
13	2.69	6.48	17.9	13.3		
14	2.95	6.39	18.2	12.75		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76 Sample ID: A76-32

Crew: L.D. + Site Date: 2019/03/16 Time: 11:50

Weather: SUNNY

Observations:

UTM Coordinates: Easting: 725 68 40 Northing: 60 1682 Waypoint:

Total Water Depth: 8.65 m Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500ML

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.89	7.37	71.3	17.72		
3	2.27	7.28	69.8	17.71		
4	2.52	7.25	61.5	17.88		
5	2.60	7.19	61.2	17.99		
6	2.67	7.12	61.7	17.66		
7	2.70	7.05	63.0	17.25		
8	2.78	7.01	63.0	17.07		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76 Sample ID: A76-31

Crew: LD ST Date: 2019-03-16 Time: 12h17

Weather: SUNNY

Observations:

UTM Coordinates: Easting: 7 256840 Northing: 601682 Waypoint:

Total Water Depth: 7,06 Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0,92	7,34	67,5	18,46		
3	1,97	7,30	61,3	18,2		
4	2,48	7,25	57,2	17,85		
5	2,63	7,15	58,3	17,61		
6	2,69	7,06	60,1	17,10		
7	2,77	7,00	59,9	16,66		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS1 Sample ID: DS1-30

Crew: L.D. ST Date: 2019-03-16 Time: 10:00

Weather: Sunny

Observations:

UTM Coordinates: Easting: 725829 Northing: 5980 28 Waypoint:

Total Water Depth: 7,74 m Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0,97	6,65	48	17,33		
2						
3	2,10	6,60	45,7	17,14		
4	2,73	6,61	43,9	17,11		
5	2,95	6,56	42,4	16,98		
6	2,96	6,49	43,2	16,18		
7	2,98	6,45	44,4	15,4		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: NEW COORDINATES Ø 5m AROUND THE ORIGINAL STATION

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS1 Sample ID: DS1-29

Crew: ST-LD Date: 16/03/2019 Time: 9:30

Weather: SUNNY

Observations:

UTM Coordinates: Easting: 726097 Northing: 597501 Waypoint:

Total Water Depth: 20M+ Secchi Depth: e

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.48	6.87	28.5	13.83		
3	1.63	6.86	25.7	13.81		
4	1.64	6.77	25.6	13.79		
5	1.65	6.71	25.7	13.76		
6	1.65	6.75	25.7	13.72		
7	1.65	6.74	25.7	13.69		
8	1.64	6.72	25.7	13.68		
9	1.65	6.69	25.6	13.67		
10	1.65	6.70	25.7	13.66		
11	1.65	6.69	25.7	13.65		
12	1.65	6.67	25.7	13.61		
13	1.65	6.65	25.7	13.57		
14	1.65	6.64	25.7	13.58		
15	1.65	6.63	25.8	13.58		
16	1.65	6.62	25.8	13.58		
17	1.65	6.62	25.8	13.58		
18	1.65	6.61	25.8	13.59		
19	1.65	6.61	25.9	13.59		
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPE
Sample ID: TPE-120
Crew: TT, KN, KM
Date: 2019-03-17
Time: 10:35
Weather: Clear
Observations:
UTM Coordinates: Easting: 14W 0638969 Northing: 7211487
Waypoint: —
Total Water Depth: 7.5 m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.78	6.85	43.2	18.32		
3	1.10	6.82	42.2	17.58		
4	0.99	6.77	43	17.47		
5	2	6.73	39.3	16.78		
6	2.11	6.69	38.1	16.17		
7	2.20	6.66	37.3	15.83		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:
Approx 2m of ice. 1st reading @ 2.5m

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPE
Sample ID: TPE - 121
Crew: K.N., K.M
Date: 2019-03-17
Time: 13:35
Weather: Clear
Observations:
UTM Coordinates: Easting: 14W 0637282 Northing: 7212026 Waypoint: —
Total Water Depth: 7.90m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.49	7.04	38.3	17.06		
3	0.58	6.97	36.7	17.12		
4	0.77	6.93	35.1	16.82		
5	0.89	6.90	34.0	16.36		
6	0.91	6.84	36.5	16.15		
7	1.0	6.81	33.9	15.71		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Approx. 2m of ice. 1st reading @ 2.5m

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPL
Sample ID: TPN-120
Crew: Kevin M. Kathleen N.
Date: 2019-03-17
Time: 16:10
Weather: Clear
Observations:
UTM Coordinates: 14W
Easting: 0636658
Northing: 7214370
Waypoint: TPN-120
Total Water Depth: 12.5m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.40	7.04	39.9	18.01		
3	0.51	7.0	38.1	18.21		
4	0.75	6.96	35.6	18.02		
5	0.88	6.94	33.6	17.46		
6	0.96	6.88	32.2	17.15		
7	0.99	6.75	31.9	15.25		
8	1.04	6.72	31.2	14.98		
9	1.10	6.70	30.9	14.63		
10	1.15	6.69	30.5	14.39		
11	1.18	6.67	30.4	14.15		
12	1.21	6.65	30.4	14.02		
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Approx. 2m of ice. 1st reading @ 2.5m

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake
Sample ID: TPN-121
Crew: KN LD
Date: 2019-03-18
Time: 11h45
Weather: Cloudy. Light Snowfall
Observations:

UTM Coordinates: Easting: 0634919 Northing: 7213954 Waypoint:

Total Water Depth: 12,90
Secchi Depth: —

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0,80	6,60	41,7	19,09		
3	0,81	6,60	37,8	18,59		
4	0,75	6,61	35,5	18,21		
5	0,85	6,60	34,6	17,78		
6	0,91	6,60	34,2	16,88		
7	1,02	6,59	33,9	16,41		
8	1,07	6,57	32,9	15,92		
9	1,11	6,56	32,4	15,61		
10	1,14	6,54	32,7	15,22		
11	1,17	6,53	32,3	14,80		
12	1,21	6,51	32,3	14,65		
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Wally
Sample ID: WAL-89
Crew: NS/JS
Date: 2019-03-28
Time: 16:00
Weather: Sunny / windy / blizzard
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 8.1 m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0	7.66	71.3	16.61		
3	2.10	7.55	64.8	16.07		
4	2.51	7.39	62.9	15.27		
5	2.70	7.31	61.9	14.73		
6	2.72	7.24	62.1	14.24		
7	2.74	7.18	62.5	13.93		
8	2.76	7.12	63.0	13.64		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Wallu
Sample ID: WAL-90
Crew: NS / Joseph
Date: 2019-03-28
Time: 14:30
Weather: sunny / windy / blizzard
Observations:

UTM Coordinates: Easting: Northing: Waypoint:

Total Water Depth: 7.4 M
Secchi Depth: /

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.1	6.75	67.6	15.96	—	
3	1.08	6.69	63.7	15.87		
4	2.64	6.65	58.7	15.40		
5	2.82	6.61	58.0	15.22		
6	2.95	6.59	57.5	15.21		
7	3.01	6.55	57.2	14.73		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Second Portage
Sample ID: SPL-120
Crew: NS / JA
Date: 2019-03-29
Time: 9:30
Weather: Sunny / light wind
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 11.30 M
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.38	6.85	53.2	18.27		
3	1.19	6.82	49.6	18.27		
4	1.97	6.81	46.9	17.27		
5	2.22	6.79	46.1	16.50		
6	2.29	6.77	46.8	15.74		
7	2.33	6.74	47.2	15.23		
8	2.36	6.70	47.4	14.66		
9	2.40	6.68	47.4	14.42		
10	2.45	6.66	48.7	14.56		
11	2.58	6.63	49.1	14.55		
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Second Portage
Sample ID: SPL-121
Crew: NS / JA
Date: 2019-03-29
Time: 10:20
Weather: Sunny / windy
Observations:

UTM Coordinates: Easting: Northing: Waypoint:

Total Water Depth: 5.1 m
Secchi Depth: —

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml

Field DUP collected?: Yes No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.60	7.22	48.7	17.43		
3	1.23	7.12	50.9	17.81		
4	1.81	7.08	50.0	17.38		
5	2.08	7.07	49.4	17.10		
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage
Sample ID: TPS-61
Crew: NS / JA
Date: 2019-03-30
Time: 15:10
Weather: Blowing snow / Sun
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 9.4 M
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.34	6.79	41.6	18.70		
3	0.59	6.81	34.3	19.01		
4	0.82	6.79	32.5	18.61		
5	0.91	6.78	31.5	17.84		
6	0.98	6.76	30.5	17.30		
7	1.04	6.74	29.5	16.71		
8	1.09	6.74	29.2	16.20		
9	1.15	6.72	29.5	15.74		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes? Done

Water Sampling and Limnology

AREA INFORMATION

Area: Pipe Dream Lake
Sample ID: PDL-73
Crew: NS / JA
Date: 2019-03-31
Time: 12:05
Weather: Wind, blowing snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:

Total Water Depth: > 20 m
Secchi Depth: /

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.48	7.18	25.5	14.95		
3	0.60	7.18	24.5	15.14		
4	0.69	7.14	24.2	14.98		
5	0.69	7.11	24.2	14.89		
6	0.77	7.1	24.5	14.83		
7	0.80	7.08	24.5	14.79		
8	0.83	7.07	24.7	14.71		
9	0.86	7.04	24.8	14.66		
10	0.87	7.0	24.9	14.62		
11	0.91	6.98	24.7	14.58		
12	0.94	6.94	25	14.51		
13	0.96	6.91	25.4	14.49		
14	0.98	6.89	25.5	14.64		
15	1	6.87	25.7	14.66		
16	1.03	6.85	25.2	14.63		
17	1.06	6.84	25.2	14.44		
18	1.11	6.82	24.8	14.18		
19	1.16	6.81	24.4	13.91		
20	1.2	6.79	24.3	13.68		

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Pipe Dream Lake
Sample ID: PDL-74
Crew: NS / JA
Date: 2019-03-31
Time: 11:10
Weather: Windy, blowing snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 14.20 m
Secchi Depth: \
Phytoplankton collected?: Yes No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.25	6.81	25.7	16.69		
3	0.60	6.81	24.5	16.58		
4	0.69	6.8	24.1	15.95		
5	0.70	6.79	24.1	15.64		
6	0.75	6.77	24.4	15.35		
7	0.80	6.76	24.4	15.18		
8	0.83	6.73	24.8	15.06		
9	0.85	6.72	25.1	14.97		
10	0.88	6.69	25.2	14.90		
11	0.91	6.67	25.6	14.90		
12	0.92	6.66	25.4	14.91		
13	0.94	6.64	25.5	14.88		
14	0.96	6.63	25.2	14.80		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Tehek Lake
Sample ID: TE - 96
Crew: NS / JA
Date: 2019-07-31
Time: 15:35 / 16:20
Weather:
Observations:
UTM Coordinates: 15 W Easting: 0360143 Northing: 7212302 Waypoint:
Total Water Depth: 10.7 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.14	7.11	42.6	20.49		
3	0.51	7.08	40.1	20.74		
4	0.82	7.04	39.4	20.53		
5	1.01	7.0	41.2	20.43		
6	1.44	6.92	40.1	19.33		
7	1.71	6.83	45.5	17.23		
8	1.97	6.81	43.9	15.87		
9	2.31	6.77	41.9	14.44		
10	2.61	6.73	42.4	13.23		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: Original location was too shallow, see coordinates

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-108
Crew: NS / JA
Date: 2019-04-01
Time: 14:54
Weather:
Observations:
UTM Coordinates: Easting: Northing: Waypoint: ~~[illegible]~~
Total Water Depth: 6.25 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.88	6.68	31.7	16.45		
3	1.94	6.71	25.2	14.65		
4	2.37	6.74	22	13.65		
5	2.48	6.84	20.8	13.30		
6	2.48	6.86	21.2	13.54		
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-109
Crew: NS / JA
Date: 2019-04-01
Time: 14:05
Weather: Cloudy / light snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 14.70M
Secchi Depth: /

Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.21	6.63	23.5	14.24		
3	1.76	6.59	21.4	14.50		
4	2.21	6.57	20	14.38		
5	2.39	6.54	19.6	13.65		
6	2.51	6.51	19.9	13.09		
7	2.63	6.43	20.8	12.21		
8	2.77	6.37	21.8	11.71		
9	2.90	6.29	21.3	11.05		
10	2.96	6.20	22.7	10.35		
11	3.13	6.14	22.5	9.21		
12	3.22	6.03	23.2	8.30		
13	3.35	5.95	26	6.31		
14	3.49	5.87	29.9	5.74		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Tehek
Sample ID: TE-97
Crew: NS / JA
Date: 2019-04-01
Time: 10:50
Weather: Cloudy / light snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 13.9 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.36	6.63	38.1	19.55		
3	0.66	6.65	37.9	18.15		
4	0.92	6.64	34.3	16.68		
5	1.16	6.68	41.5	15.28		
6	1.37	6.55	44.2	14.05		
7	1.75	6.55	41.4	11.91		
8	2.24	6.55	38.3	10.77		
9	2.56	6.54	37.2	9.46		
10	2.68	6.56	36.5	8.69		
11	2.77	6.56	36.8	7.32		
12	2.94	6.56	38.1	6.42		
13	3.13	6.57	39.1	6.10		
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Tehek
Sample ID: TEFF-48
Crew: NS / JA
Date: 2019-04-01
Time: 9.55
Weather: Cloudy / light snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 10.20 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.38	6.55	29.7	18.85		
3	0.66	6.52	26.1	18.95		
4	0.86	6.49	29.3	18.98		
5	1.11	6.50	26.7	18.88		
6	1.44	6.45	27.4	18.25		
7	1.82	6.42	28.1	17.45		
8	2.20	6.34	27	14.82		
9	2.49	6.26	27.1	13.41		
10	2.75	6.16	27.6	11.25		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Tehek Lake
Sample ID: TEFF-49
Crew: NS / JA
Date: 2019-04-01
Time: 9:10
Weather: Cloudy / light snow
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 10.50 m
Secchi Depth: ∅
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.35	6.63	29.2	18.23		
3	0.60	6.61	27.1	18.71		
4	0.85	6.58	24.3	18.50		
5	1.13	6.55	23	18.26		
6	1.40	6.50	24.6	17.80		
7	1.91	6.46	24.3	16.26		
8	2.19	6.42	23.6	15.05		
9	2.45	6.36	23.6	13.31		
10	2.73	6.26	23.5	11.51		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: APRIL Profile
Crew: L.D, & K.M
Date: 2019/04/13
Time: 10:30
Weather: ~5 sunny
Observations:
UTM Coordinates: 14W
Easting: 7254852
Northing: 605074
Waypoint:
Total Water Depth: 8.18 m
Secchi Depth: Ø
Phytoplankton collected?: Yes (No)
Volume Filtered: Ø
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.18	6.56	155.5	14.75		
3	3.72	6.51	160	15.15		
4	3.85	6.46	159.8	15.18		
5	4.03	6.47	161	15.41		
6	4.18	6.49	169.8	16.09		
7	4.15	6.52	176.5	17.37		
8	4.12	6.44	177.5	17.97		
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Nemo Lake
Sample ID: April Profile
Crew: L.D. & K.M
Date: 2019/04/13
Time: 11:07
Weather: -5 Sunny
Observations:
UTM Coordinates: 14W
Easting: 7257463
Northing: 606661
Waypoint:
Total Water Depth: 6.3m
Secchi Depth: Ø
Phytoplankton collected?: Yes (No)
Volume Filtered: Ø
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.42	6.93	34.9	15.31		
3	2.71	6.88	33.8	15.12		
4	2.79	6.88	33.5	15.05		
5	2.84	6.88	33.5	15.03		
6	2.85	6.89	32.6	15.03		
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage East
Sample ID:
Crew: Jamie K / Jonathan P
Date: 2019-04-13
Time: 16:08
Weather: Sunny, partly cloudy
Observations:

UTM Coordinates: Easting: 14W 0637969
Northing: 7210205
Waypoint:

Total Water Depth: 16 meters
Secchi Depth: N/A

Phytoplankton collected?: Yes No
Volume Filtered:

Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0.09	6.90	55.6	18.54		
2	0.29	6.85	50.3	18.78		
3	1.34	6.81	42.9	18.21		
4	1.92	6.80	39.2	17.57		
5	2.19	6.77	37.6	17.07		
6	2.30	6.74	37.0	16.51		
7	2.37	6.72	36.4	16.05		
8	2.42	6.68	35.9	15.47		
9	2.47	6.64	36.4	14.39		
10	2.50	6.62	36.8	13.74		
11	2.55	6.59	37.0	13.37		
12	2.57	6.55	37.1	12.85		
13	2.59	6.51	37.4	12.23		
14	2.63	6.47	37.5	11.59		
15	2.67	6.44	37.5	11.18		
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: CREMP Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPN
Sample ID: TPN
Crew: Jonathan / Kathleen
Date: 2019-04-14
Time: 10:42
Weather: cloudy
Observations:

UTM Coordinates: Easting: 0635899 Northing: 7215137 Waypoint:
Total Water Depth: > 25 m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: —
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.46	6.91	39.6	18.59		
3	0.69	6.89	37.3	18.10		
4	0.83	6.87	36.2	17.63		
5	0.96	6.87	34.6	17.08		
6	1.05	6.85	33.8	16.5		
7	1.12	6.84	32.6	15.87		
8	1.16	6.81	32.4	15.39		
9	1.20	6.78	32.6	14.99		
10	1.23	6.77	32.5	14.75		
11	1.27	6.74	32.3	14.52		
12	1.29	6.73	32.9	14.38		
13	1.32	6.71	33.5	14.37		
14	1.37	6.69	33.1	14.36		
15	1.42	6.67	32.5	14.26		
16	1.45	6.64	33.4	14.05		
17	1.5	6.63	34	14.16		
18	1.55	6.61	33.6	14.20		
19	1.59	6.59	34.1	14.14		
20	1.62	6.58	33.6	14.14		

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: CREMP PROFILE ONLY

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SP lake
Sample ID: SP
Crew: Jonathan / Kathleen
Date: 2019-04-16
Time: 9:15
Weather: Clear sky
Observations:

UTM Coordinates: Easting: 0640080 Northing: 7214080 Waypoint:

Total Water Depth: 11 meters
Secchi Depth: /

Phytoplankton collected?: Yes ~~No~~
Volume Filtered: /

Field DUP collected?: Yes ~~No~~
Arsenic speciation collected?: Yes ~~No~~

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	0.85	7.01	60	16.98		
3	1.55	7.04	56.9	16.99		
4	2.24	7.07	53.9	16.62		
5	2.45	7.04	52.9	15.90		
6	2.52	7.01	53.3	15.30		
7	2.57	6.98	53.3	14.67		
8	2.58	6.94	53.6	14.40		
9	2.60	6.92	53.8	14.20		
10	2.64	6.88	54.0	14.13		
11	2.86	6.85	54.4	13.83		
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: (REMP PROFILE ONLY.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WALLY LAKE
Sample ID: Wally
Crew: Jonathan P / Kathleen
Date: 2019-04-16
Time: 14:30
Weather:
Observations:
UTM Coordinates: 15W
Easting: 0361805
Northing: 7222824
Waypoint:
Total Water Depth: 5.5 meters
Secchi Depth: /
Phytoplankton collected?: Yes ~~No~~
Volume Filtered: /
Field DUP collected?: Yes ~~No~~
Arsenic speciation collected?: Yes ~~No~~

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.43	6.78	66.3	14.76		
3	2.08	6.76	64.3	14.73		
4	2.66	6.72	62.5	14.49		
5	2.84	6.68	61.7	14.06		
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: 2 meters of ice

CREMP PROFILE ONLY

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76 Sample ID: A76-33

Crew: F.L. & K.M Date: 2019-05-06 Time: 12:50

Weather:

Observations: overcast - DRILL EXPLO at 1km away

UTM Coordinates: Easting: 602554 Northing: 7257152 Waypoint: Ø

Total Water Depth: 13.9 m Secchi Depth: Ø

Phytoplankton collected?: (Yes) No Volume Filtered: 500 mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	3.04	6.64	61.7	15.54	0.74	
3	4.17	6.62	61.8	15.66	0.75	
4	4.18	6.61	61.8	15.73	0.79	
5	4.18	6.61	61.8	15.87	0.8	
6	4.17	6.61	61.8	15.98	0.78	
7	4.17	6.61	61.8	16.07	0.81	
8	4.17	6.61	61.9	16.16	0.74	
9	4.15	6.61	61.9	16.21	0.82	
10	4.15	6.61	62.0	16.23	0.8	
11	4.15	6.61	62	16.23	0.83	
12	4.15	6.62	61.9	16.24	0.73	
13	4.17	6.62	61.9	16.27	0.74	
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76

Sample ID: A76-34

Crew: F.L, & K.M

Date: 2019/05/06

Time: 12:15

Weather: Overcast

Observations: DRILL explo 7 1km

UTM Coordinates: Easting: 604383

Northing: 7252617

Waypoint: Ø

Total Water Depth: 11.40m

Secchi Depth: Ø

Phytoplankton collected?: (Yes) No

Volume Filtered: 500M

Field DUP collected?: Yes (No)

Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.36	6.61	62.9	16.40	0.79	
3	3.89	6.59	60.7	16.20	0.81	
4	3.96	6.59	61.0	16.19	0.76	
5	4.15	6.58	62.3	16.22	0.75	
6	4.16	6.58	62.5	16.26	0.78	
7	4.14	6.58	62.3	16.37	0.70	
8	4.03	6.58	62.0	16.47	0.69	
9	4.09	6.58	62.7	16.48	0.69	
10	4.10	6.58	63.7	16.50	0.76	
11	4.10	6.56	65.7	16.58	0.7	
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS1

Sample ID: DS1-31

Crew: F.L. & K.M.

Date: 2019/05/06

Time: 10:40

Weather: overcast. light snow

Observations:

UTM Coordinates: 14W Easting: 597517

Northing: 7260741

Waypoint: Ø

Total Water Depth: 12.10m

Secchi Depth: Ø

Phytoplankton collected?: (Yes) No

Volume Filtered: 500M

Field DUP collected?: Yes (No)

Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.13	6.86	28.3	14.48	0	
3	2.17	6.72	27.8	14.58	0	
4	2.19	6.70	27.8	14.65	0	
5	2.20	6.68	27.8	14.55	0	
6	2.2	6.65	27.7	14.5	0	
7	2.2	6.66	27.7	14.49	0	
8	2.2	6.67	27.7	14.49	0	
9	2.2	6.67	27.8	14.48	0	
10	2.2	6.66	27.8	14.47	0	
11	2.2	6.65	27.8	14.46	0	
12	2.2	6.65	27.8	14.46	0	
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: overcast.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS1
Sample ID: DS1-32
Crew: F.L, & K.M.
Date: 2019/05/06
Time: 11:20
Weather: Overcast
Observations: light snow
UTM Coordinates: Easting: 602554
Northing: 7257152
Waypoint: Ø
Total Water Depth: 9.20m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ML
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.40	6.51	41.3	16.31	0	
3	4.13	6.43	45.1	15.91	0	
4	4.16	6.42	45.3	16.19	0	
5	4.17	6.42	45.3	16.38	0	
6	4.17	6.42	45.3	16.58	0	
7	4.17	6.43	45.4	16.78	0	
8	4.18	6.42	46.2	16.91	0	
9	4.15	6.41	46.3	16.89	0	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

(2)

AREA INFORMATION

Area: TPL
Sample ID: TPN-122
Crew: TT, NS, EF
Date: 2019-05-06
Time: 4:55
Weather: Sunny w/ clouds
Observations:
UTM Coordinates: Easting: 14W 0635389 Northing: 7212917
Waypoint: —
Total Water Depth: 10.4 m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
(3)	0.63	6.81	40.7	16.68		
4	0.90	6.77	38.3	17.11		
5	1.13	6.74	33.9	16.34		
6	1.21	6.71	33.3	15.93		
7	1.25	6.68	33.9	15.25		
8	1.28	6.65	34.2	15.03		
9	1.32	6.62	34.3	14.97		
10	1.36	6.65	36.4	14.06		
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: DO (-1.) 119.8 (-1.) (3m)

Equipment Blank Collection Notes?

Water Sampling and Limnology

(1)

AREA INFORMATION

Area: ~~TPN~~ TPL
Sample ID: TPN-123
Crew: EF, NS, TT
Date: 2019-05-06
Time: 16:15
Weather: Sunny + clouds (-5°C)
Observations:
UTM Coordinates: Easting: 14W 0634710 Northing: 7216091
Waypoint: —
Total Water Depth: 14.3m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: 500 mL
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
3	0.85	6.71	44	17.9		
4	1.12	6.69	41.2	18.10		
5	1.23	6.67	39.3	17.89		
6	1.30	6.65	38.6	17.79		
7	1.37	6.63	39.4	17.84		
8	1.43	6.62	~~[illegible]~~ 40.4	18.00		
9	1.5	6.60	39.3	17.81		
10	1.6	6.55	37.6	~~[illegible]~~ 16.81		
11	1.66	6.51	36.8	16.22		
12	1.70	6.48	39.2	16.10		
13	1.74	6.47	38.2	16.35		
14	1.77 ~~[illegible]~~	6.46	37.3	14.26		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: 128.3 to (3m)

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPL

Sample ID: TPE-122

Crew: EF, NS, MA, SM

Date: 2019-05-07

Time: 2:00pm

Weather: snowing, foggy

Observations:

UTM Coordinates: Easting: Northing: Waypoint:

Total Water Depth: 11.6 m

Secchi Depth: 0

Phytoplankton collected?: Yes No

Volume Filtered: 500

Field DUP collected?: Yes No

Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
3	1.82	6.58	41.8	96.10	—	
4	2.21	6.54	39.9	15.32		
5	2.33	6.49	39.2	14.03		
6	2.40	6.44	39.2	12.72		
7	2.48	6.4	40.9	12.23		
8	2.53	6.38	42.4	98.5		
9	2.59	6.36	42.4	12.23		
10	2.63	6.35	41.8	12.26		
11	2.69	6.31	42.7	12.84		
12	~~2.84~~	~~6.28~~	~~54~~	~~12.26~~		
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPL
Sample ID: TPE-128
Crew: MA, SM, EF, N
Date: 07.05.19
Time: 15:44
Weather:
Observations:

UTM Coordinates: Easting: Northing: Waypoint:
Total Water Depth: 14.74 m
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)
DUP-1

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
3	1.61	6.51	43.1	15.82		
4	2.03	2.19	41.4	15.73		
5	2.05	1.46	41.6	15.58		
6	2.47	1.43	47.2	15.31		
7	2.55	1.42	41.8	15.03		
8	2.54	1.41	47	14.88		
9	2.31	1.39	47.2	14.60		
10	2.06	1.38	41.9	14.55		
11	2.78	1.37	47.7	14.56		
12	2.79	1.37	42.3	14.51		
13	2.83	1.36	47.7	14.52		
14	2.96	1.37	47.4	14.50		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D1 Sample ID: LK1-9

Crew: L.D. & K.M Date: 2019-05-10 Time: 12:35

Weather: -5°c

Observations:

UTM Coordinates: 14W Easting: 7249512 Northing: 607086 Waypoint:

Total Water Depth: 8.39m Secchi Depth: ∅

Phytoplankton collected?: (Yes) No Volume Filtered: 500

Field DUP collected?: Yes No Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.31	6.53	31.3	15.7	0	
3	2.47	6.48	28	14.53	0	
4	3.60	6.44	25.2	14.03	0	
5	3.95	~~6.35~~ 6.44	24.1	~~14.~~ 14.16	0	
6	4	6.46	24	14.62	0	
7	4.09	6.49	24	15.11	0	
8	4.02	6.53	24	15.42	0	
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D1 Sample ID: LK1-10

Crew: L.D. & K.M. Date: 2019-05-10 Time: 13:10

Weather: -5°C

Observations:

UTM Coordinates: 14 W Easting: 7250092 Northing: 607906 Waypoint:

Total Water Depth: 10.29 m Secchi Depth: 0

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: (Yes) No Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						* more then
3	2.64	6.5	26.6	14.4	0	2 meters
4	3.02	6.5	25.7	14.25	0	of ice.
5	3.11	6.5	25.3	14.24	0	
6	3.15	6.52	25.3	14.34	0	
7	3.17	6.53	25.3	14.51	0	
8	3.19	6.56	25.4	14.66	0	
9	3.25	6.69	25.3	15.21	0	
10	3.29	6.77	25.6	15.45	0	
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS
Sample ID: LKS-9
Crew: LD - KM
Date: 2019-05-10
Time: 14:10
Weather: -5
Observations: 7252527 612605
UTM Coordinates: Easting: ~~7252560~~ Northing: ~~612627~~ Waypoint:
Total Water Depth: 15.55
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						* more then
3	3.89	6.81	39.2	13.46	0	a meters
4	4.02	6.81	39.4	12.95	0	of ice
5	4.06	6.81	39.6	12.49	0	
6	4.07	6.81	39.9	11.73	0	
7	4.05	6.81	40	10.83	0	
8	3.98	6.82	40.6	10.17	0	
9	3.89	6.83	42.7	9.08	0	
10	3.86	6.88	44.4	7.99	0	
11	3.78	6.93	45.2	6.4	0	
12	3.59	7.02	45.7	5.23	0	
13	3.6	7.11	46.3	4.64	0	
14	3.5	7.14	57.3	5.44	0	
15	3.48	6.88	87.2	15.03	0	
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D5
Crew: LD-KM
Weather: -S
Observations:

Sample ID: LK5-10
Date: 2019-05-10
Time: 14.35

UTM Coordinates: Easting: 7252583 Northing: 612440 Waypoint:

Total Water Depth: 6.47 m

Secchi Depth: Ø

Volume Filtered: 500 ml

Phytoplankton collected?: (Yes) No

Field DUP collected?: (Yes) No

Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						* more
2						then 2
3	3.72	6.87	40.02	15.02	0	meters of
4	3.99	6.88	39.7	15.05	0	ice.
5	4	6.89	39.7	15.19	0	
6	4.	6.89	39.8	15.25	0	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: MAM-39
Crew: LD-KM
Date: 2019-05-10
Time: 9:40
Weather: -S
Observations: Close to a dymond drill ≈ 50m
UTM Coordinates: 14W Easting: 725109
Northing: 6053 54
Waypoint:
Total Water Depth: 9.47m
Secchi Depth: Ø
Volume Filtered: 500 ml
Phytoplankton collected?: (Yes) No
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	3.23	6.58	178.2	18.16	17.2	
3	4.05	6.59	177.4	17.92	16.3	
4	4.19	6.57	180.2	17.82	16.9	
5	4.37	6.54	186.1	17.53	18.5	
6	4.49	6.51	195.5	17.27	20.5	
7	4.69	6.5	204.1	16.99	21.3	
8	4.67	6.52	205.8	16.76	20.3	
9	4.66	6.56	205.8	16.31	13.35	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: MAM-40
Crew: L.D - KM
Date: 2019-05-10
Time: 10:30
Weather: -5
Observations:
UTM Coordinates: 14W
Easting: 72 54 478
Northing: 60 40 68
Waypoint:
Total Water Depth: 13.23m
Secchi Depth: ∅
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.75	6.49	115	16.88	0	
3	3.96	6.48	108.8	16.58	0	
4	3.96	6.48	108.8	16.44	0	
5	3.95	6.47	108.8	16.26	0	
6	3.98	6.46	109	16.03	0	
7	4.03	6.45	109.1	15.72	0	
8	4.05	6.42	110	15.3	0	
9	4.04	6.37	110.3	14.58	0	
10	4.05	6.31	110.6	14.27	0	
11	3.84	6.26	110.3	13.85	0	
12	3.79	6.31	111.5	14.8	0	
13	3.8	6.35	112.3	15.47	0	
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A20
Sample ID: A20 - 33
Crew: AD- KM
Date: 2015-05-11
Time: 12:00
Weather: -4 Cloudy
Observations:

UTM Coordinates: Easting: 60 5204 Northing: 7 252788 Waypoint:
Total Water Depth: 5.58
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	4.10	6.6	32.5	18.24	0	
3	4.10	6.62	32.6	17.99	0	
4	4.09	6.66	32.6	17.58	0	
5	4.09	6.73	32.6	16.9	0	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A20
Sample ID: A20-34
Crew: L.D- KM
Date: 2014-05-11
Time: 12:25
Weather: -4 Cloudy
Observations:
UTM Coordinates: 14 W
Easting: 7252617
Northing: 6043383
Waypoint:
Total Water Depth: More then 19m.
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	3.86	6.72	19.6	15.67	0	
3	4	6.72	19.4	15.54	0	
4	4	6.7	19.3	15.55	0	
5	3.99	6.71	19.3	15.56	0	
6	3.99	6.71	19.3	15.56	0	
7	3.99	6.72	19.3	15.58	0	
8	3.98	6.73	19.3	15.58	0	
9	3.99	6.74	19.3	15.58	0	
10	3.98	6.74	19.3	15.59	0	
11	3.98	6.75	19.3	15.64	0	
12	3.98	6.78	19.4	15.7	0	
13	3.98	6.79	19.4	15.74	0	
14	3.98	6.8	19.4	15.78	0	
15	3.95	6.82	19.3	15.87	0	
16	3.94	6.84	19.3	15.83	0	
17	3.92	6.86	19.3	16.05	0	
18	3.91	6.89	19.3	16.19	0	
19	3.89	6.93	19.4	16.41	0	
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D8
Crew: LD - KM
Weather: -4 Cloudy
Observations:

Sample ID: LK8-10
Date: 2015-05-11
Time: 10:25

UTM Coordinates: 14W Easting: 610686 Northing: 7258634 Waypoint:
Total Water Depth: 8.33m
Secchi Depth: 0

Phytoplankton collected?: (Yes) No
Field DUP collected?: Yes (No)

Volume Filtered: 500 ml
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.95	6.77	18.2	13.9	0	
3	3.18	6.8	18	13.83	0	
4	3.20	6.82	18	13.83	0	
5	3.23	6.94	18	13.83	0	
6	3.25	6.97	18	13.91	0	
7	3.25	7.01	18	13.79	0	
8	3.26	7.06	17.9	13.79	0	
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D8
Sample ID: LK8-9
Crew: 2D - KM
Date: 2014-05-11
Time: 9:50
Weather: -4 Cloudy
Observations:
UTM Coordinates: 14W
Easting: 612110
Northing: 7258792
Waypoint:
Total Water Depth: 13.83m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	2.34	6.66	24.6	15.25	0	
3	3.40	6.69	18.7	14.73	0	
4	3.47	6.69	18.9	14.68	0	
5	3.53	6.68	18.6	14.64	0	
6	3.55	6.67	18.5	14.57	0	
7	3.56	6.67	18.5	14.52	0	
8	3.56	6.66	18.5	14.42	0	
9	3.58	6.65	18.4	14.32	0	
10	3.63	6.64	18.4	14.17	0	
11	3.71	6.63	18.4	13.91	0	
12	3.77	6.61	18.4	13.67	0	
13	3.88	6.58	18.6	13.30	0	
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Second Portage
Sample ID: SP-122
Crew: TT MBA SM
Date: 2019/05/11
Time: 14:36
Weather: Clear
Observations: None
UTM Coordinates: 14U
Easting: 0640557
Northing: 7212857
Waypoint: —
Total Water Depth: 12m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.9	6.49	51.2	16.68		122.9
3	↓	↓	↓	↓		↓
4	2.63	6.48	49.9	16.94		
5	2.82	6.46	51.1	17.3		
6	3.04	6.45	53	17.37		
7	3.14	6.44	52.8	17.66		
8	3.20	6.41	52.7	17.52		
9	3.33	6.39	52.5	17.07		
10	3.41	6.39	53	16.81		
11	3.49	6.38	57.5	16.61		
12	~~3.44~~	—	—	—	—	
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: 12 meter deep

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Second Portage
Sample ID: SP - 123
Crew: TJM Michael BB Steph M
Date: 2019-05-11
Time: 13:52
Weather: Sunny
Observations:
UTM Coordinates: 14W
Easting: 0640103
Northing: 7210448
Waypoint: —
Total Water Depth: 6m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2						
3	2.007	6.62	50.5	15.16		% 116.4
4	2.77	6.6	48.3	15.5		
5	2.88	6.59	48.2	15.17		
6	—	—				
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: NEMO
Sample ID: NEM-39
Crew: KM LD
Date: 2019/05/13
Time: 10:35
Weather: -3 LIGHT SNOW
Observations:
UTM Coordinates: 14W Easting: 606617
Northing: 7257602
Waypoint:
Total Water Depth: 10.5m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ML
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	3.61	6.88	35.5	16.32	0	
3	3.91	6.87	35.4	16.02	0	
4	3.92	6.87	35.4	15.92	0	
5	3.94	6.86	35.4	15.86	0	
6	3.93	6.86	35.3	15.75	0	
7	3.93	6.85	35.4	15.64	0	
8	3.9	6.84	35.6	15.48	0	
9	3.86	6.83	35.8	15.19	0	
10	3.88	6.79	35.9	14.88	0	
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: NEMO
Sample ID: NEM-40
Crew: KM LD
Date: 2019/05/13
Time: 10:15
Weather: -3 LIGHT SNOW
Observations:
UTM Coordinates: 14W Easting: 606571
Northing: 7257957
Waypoint:
Total Water Depth: 15.8m
Secchi Depth: Ø
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ML
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	3.98	6.89	35.4	16.18	0	
3	4	6.89	35.4	16.10	0	
4	4.01	6.89	35.3	16.08	0	
5	4.02	6.88	35.4	16	0	
6	4.02	6.88	35.5	15.91	0	
7	4.03	6.88	35.5	15.81	0	
8	4.03	6.87	35.5	15.71	0	
9	4.03	6.87	35.5	15.58	0	
10	4.02	6.87	35.5	15.28	0	
11	4.02	6.86	35.4	14.95	0	
12	4.03	6.85	35.4	14.66	0	
13	4.06	6.85	35.4	14.39	0	
14	4.06	6.86	35.5	14.24	0	
15	4.10	6.9	35.1	14.25	0	
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: UTS
Sample ID: UTS-39
Crew: L.D - MM
Date: 2019-05-13
Time: 9:15
Weather: -3 light snow windy
Observations:
UTM Coordinates: 14W
Easting: 607574
Northing: 7254084
Waypoint:
Total Water Depth: 7.97m
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.40	6.63	156	14.35	1	
3	1.6	6.63	156.7	14.33	1.3	
4	1.61	6.63	156.1	14.34	1.46	
5	1.62	6.63	155.9	14.33	1.33	
6	1.64	6.63	154.7	14.34	2.09	
7	1.69	6.64	152.8	14.31	1.38	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: UTS
Sample ID: UTS-40
Crew: LD-KM
Date: 2019-05-13
Time: 8:45
Weather: -3 light snow windy
Observations:
UTM Coordinates: 14W
Easting: 607163
Northing: 7253609
Waypoint:
Total Water Depth: 9.95m
Secchi Depth: 0
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1						
2	1.39	6.63	135.2	15.07	1	
3	1.68	6.62	136.8	15.12	0.25	
4	1.94	6.62	135.2	15.21	0	
5	1.93	6.58	138.6	15.20	0.20	
6	1.95	6.58	139.1	15.12	0.11	
7	1.98	6.59	137.8	15.04	0.15	
8	2.01	6.59	136.9	14.96	0.29	
9	2.06	6.58	137.3	14.81	0.20	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Wally Lake
Sample ID: WAL-92
Crew: Isabelle Couture, Stephanie Mercier, Gabriel Jodee
Date/ Time: 2019-05-16 15h46.
Weather: ~~Clou~~ overcast, little windy. Added to EQUIS 2)
Observations:

UTM Coordinates: 15W **Easting:** 0361425 **Northing:** 7222234 **Waypoint:** –

Total Water Depth: 5.5 m **Secchi Depth:** –

Phytoplankton collected? (Circle one): (Yes) No **Volume Filtered:**

Field DUP collected? (Circle one): Yes (No) **Photo #s:** –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen		pH	Turbidity	
units:	°C	µS/cm	mg/L			NTU	
0			%				
1	0.17	72.9	104.7	14.82	6.93		
2	0.59	71.3	105.5	14.66	6.93		
3	0.98	77.4	111.7	14.11	6.92		
4	2.60	76.4	103.4	13.95	6.89		
5	2.90	66	115.1	14.24	6.83		
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

We moved the station as we were very close from the ground.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WALLY LAKE
Sample ID: WAL-91
Crew: Isabelle Couture, Stephanie Mercer, Gabriel J. on EQuiS=)
Date/ Time: May 16th 2019, 17:00
Weather: overcast, little windy
Observations:

UTM Coordinates: 15W Easting: 0361932 Northing: 7229655 Waypoint: –
Total Water Depth: 13 meters Secchi Depth: –
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered:
Field DUP collected? (Circle one): Yes (No) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	DNR					
1	0.2	36.4	15.58	7.05		
2	0.01	37.1	15.48	6.94		
3	1.09	60.8	15.75	6.93		
4	2.16	58.6	15.07	6.85		
5	2.99	58.5	14.61	6.79		
6	3.09	58.3	14.21	6.74		
7	3.14	58	13.73	6.70		
8	3.35	57.1	13.26	6.65		
9	3.43	57.5	12.40	6.6		
10	3.5	58.2	11.43	6.56		
11	3.6	58.4	10.38	6.5		
12	3.76	60.5	9.13	6.41		
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: The GPS point was on the shore.
We moved it 3 times and we had 0.5 meters of water.
We had to move further away.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-110
Crew: Isabelle Couture, Stéphanie Mercier
Date/ Time: 2019-05-18 / 10h55
Weather: Sunny, little windy, -5 °C
Observations: no.

UTM Coordinates: 14W Easting: 0622672 Northing: 7214948 Waypoint: —

Total Water Depth: 8m Secchi Depth: —

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500ml : Chloro | 225ml with disc filter

Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen		pH	Turbidity	
units:	°C	µS/cm	mg/L	%		NTU	
0							
1	0.06	25.5	16.88	117.9	7.22		
2	0.08	25.3	17.23	120.7	7.21		
3	1.64	20.1	17.32	124.8	7.20		
4	2.46	18.6	16.96	126.3	7.15		
5	2.71	18.9	16.70	125.2	7.08		
6	2.84	20.3	16.36	122.8	7.00		
7	3.02	21.4	15.64	117.8	6.92		
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INVG
Sample ID: INVG-111
Crew: Isabelle Couture, Stéphanie Mercier
Date/ Time: 2019-05-18 / 11:50 am
Weather: Sunny, little windy -5°C
Observations:

UTM Coordinates: 14W Easting: 0622715 Northing: 7216489 Waypoint: —

Total Water Depth: 11 m Secchi Depth: —

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500ml chloro | 225ml with disc filter

Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen		pH	Turbidity	
units:	°C	µS/cm	mg/L	%		NTU	
0							
1	0.02	26.5	17.07	119.2	7.17		
2	0.14	26.7	17.17	120.5	7.17		
3	1.6	22.7	16.94	125.5	7.09		
4	2.56	21.6	17.87	135	6.93		
5	2.74	21	18.79	140.4	6.83		
6	2.92	20.1	18.93	143.5	6.76		
7	3.09	19.6	19.15	145.4	6.68		
8	3.22	20.4	18.92	143.6	6.56		
9	3.37	22.0	18.33	139.5	6.45		
10	3.60	23.9	16.72	128.8	6.30		
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Pipe dream Lake
Sample ID: PD1-75
Crew: Stéphanie M., Isabelle Couture
Date/ Time: 2019-05-18 1:30 pm
Weather: Sunny, windy -1°C
Observations:

UTM Coordinates: 14W Easting: 0630635 Northing: 7222999 Waypoint: —

Total Water Depth: 5.3 m Secchi Depth: —

Phytoplankton collected? (Circle one): Yes (circled) No

Volume Filtered: 500ml : chloro | 225ml with disc filter

Field DUP collected? (Circle one): Yes No (circled)

Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen		pH	Turbidity	
units:	°C	µS/cm	mg/L	%		NTU	
0							
1	-0.01	33.9	14.5	108.8	6.89		
2	0.04	33.7	16.34	115	6.82		
3	0.74	31	17.61	126.9	6.79		
4	1.15	29.4	18.73	135.2	6.77		
4.5	1.16	28.7	19.16	138	6.77		
5	1.21	28	19.04	137.1	6.76		
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber ✓	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass ✓	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic ✓	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: At the original GPS point, we had only 4 meters of water. We moved 20 m away to do another hole and to get our samples

Equipment Blank Collection Notes? * 2 bottles (500ml) were missing in our kit. We took a 1L chloro bottle that were rinsed several times before to fill up. Back at the office, we transfered the water in 2 bottles of 500ml. *

Water Sampling and Limnology

AREA INFORMATION

Area: Pipedream Lake
Sample ID: PDL-76
Crew: Stephanie Mercier, Isabelle Couture
Date/ Time: 2019-05-18 / 12h45
Weather: Sunny, little windy -1°C
Observations:

UTM Coordinates: 14W Easting: 0629784 Northing: 7224749 Waypoint:

Total Water Depth: 15m Secchi Depth: —

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500ml : chloro | 225 ml with disc filter.

Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen		pH	Turbidity	
units:	°C	µS/cm	mg/L	%		NTU	
0							
1	-0.03	39.6	16.90	117.0	6.86		
2	0.01	31.7	17.19	120.3	6.79		
3	0.6	26	17.51	124.5	6.8		
4	1.04	25.9	17.74	127.3	6.79		
5	1.16	27	17.56	126	6.76		
6	1.26	27.4	17.3	124.6	6.75		
7	1.33	27.6	17.03	123.1	6.74		
8	1.37	27.7	16.83	121.7	6.73		
9	1.43	27.1	16.61	120.1	6.71		
10	1.44	29.9	16.31	117.3	6.68		
11	1.48	28.9	16.06	116.5	6.68		
12	1.50	28.9	16.0	116.2	6.66		
13	1.55	28.7	15.98	116.2	6.66		
14	1.60	28.0	15.58	113.5	6.65		
15							
16							
17							
18							
19							
20							

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: NEMO
Sample ID: NEM-41
Crew: ST LD
Date/ Time: 16:00 2019-07-05
Weather: CLOUDY
Observations: LIGHT RAIN

UTM Coordinates: Easting: 14W 606131 Northing: 7257409 Waypoint: NEM-41

Total Water Depth: 11.93 m Secchi Depth: 7m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ml

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	5.13	31.5	13.42	7.01	0	
1	5.06	31.4	13.43	7.02	0	
2	5.07	31.5	13.43	6.99	0	
3	5.07	31.5	13.43	6.98	0	
4	5.05	31.5	13.43	6.97	0	
5	5.07	31.5	13.43	6.95	0	
6	5.06	31.5	13.41	6.94	0	
7	5.06	31.4	13.39	6.93	0	
8	5.06	31.5	13.38	6.92	0	
9	5.05	31.5	13.33	6.92	0	
10	5.03	31.4	13.27	6.92	0	
11	5.01	31.5	13.16	6.92	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

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Equipment Blank Collection Notes?

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Water Sampling and Limnology

AREA INFORMATION

Area: NEMO
Sample ID: NEM-92
Crew: ST LD
Date/ Time: 16:20 2019-07-05
Weather: CLOUDY
Observations: LIGHT RAIN

UTM Coordinates: Easting: 14W 606634 Northing: 7257813 Waypoint: NEM-92

Total Water Depth: 10.30 Secchi Depth: 7m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500ml

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	5.06	31.9	13.61	6.96	0	
1	5.05	31.9	13.62	6.94	0	
2	5.07	31.9	13.62	6.94	0	
3	5.03	31.8	13.61	6.94	0	
4	5.05	31.9	13.63	6.91	0	
5	5.02	31.9	13.61	6.91	0	
6	5.00	31.8	13.57	6.90	0	
7	4.93	31.8	13.58	6.90	0	
8	4.94	31.8	13.54	6.89	0	
9	4.92	31.8	13.51	6.89	0	
10	4.92	31.9	13.44	6.88	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: ARSENIC SPECIATION COLLECTED

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WTS
Sample ID: WTS-41
Crew: LD-ST
Date/ Time: 2019-07-06 11h45
Weather: 17°C mostly Cloudy
Observations: Windy and waves

UTM Coordinates: Easting: 60 72 69 Northing: 7 25 369 Waypoint: WTS-41

Total Water Depth: 15,85 Secchi Depth: 5 m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ml

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

DO pH COM

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	7,87	103,3	11,48	6,86	0	
1	8,03	102,7	11,99	6,88	0	
2	8	102,2	12,42	6,88	0	
3	7,94	102,6	12,44	6,87	0	
4	7,84	103,3	12,45	6,87	0	
5	7,82	103,4	12,47	6,88	0	
6	7,75	103,5	12,48	6,88	0	
7	7,34	104,1	12,59	6,88	0	
8	7,04	105,2	12,68	6,89	0	
9	6,87	105,6	12,70	6,90	0	
10	6,75	105,7	12,66	6,90	0	
11	6,30	109,0	12,77	6,92	0	
12	6,03	106,3	12,59	6,82	0	
13	5,79	106,2	12,58	6,81	0	
14	5,65	106,3	12,51	6,80	0	
15	5,55	106,3	12,56	6,79	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Arsenic speciation collected

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: UTS
Sample ID: UTS-42
Crew: Louis Dubois / Samuel Tozzo
Date/ Time: 2019-08-06 12h15
Weather: 19° mostly cloudy
Observations: Minder and Beaver

UTM Coordinates: Easting: 607488 Northing: 7254336 Waypoint: UTS-42
Total Water Depth: 12,09 Secchi Depth: 5,5 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ml
Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	6,49	105,8	12,69	6,89		
1	6,47	105,8	12,60	6,88		
2	6,43	105,8	12,57	6,88		
3	6,40	105,8	12,50	6,86		
4	6,85	105,8	12,46	6,85		
5	6,82	105,8	12,35	6,84		
6	6,75	105,9	12,24	6,83		
7	6,66	105,9	12,10	6,82		
8	6,80	105,6	11,73	6,80		
9	6,69	105,9	11,27	6,78		
10	6,55	106,0	10,71	6,77		
11	6,33	106,0	6,59 9,40	6,69		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: Mam-41
Crew: Louis D. Alice B A.
Date/ Time: 2019-07-07 14h 50
Weather: 17° cloudy
Observations:

UTM Coordinates: Easting: 607269 Northing: 7253659 Waypoint: Mam-41

Total Water Depth: 8,38 Secchi Depth: 5m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ml

Field DUP collected? (Circle one): (Yes) No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	8.14	81.8	12.48	6.87	0
1	8.14	81.9	12.65	6.85	0
2	8.01	82.1	12.73	6.84	0
3	7.62	82.1	12.83	6.84	0
4	7.47	82.1	12.83	6.83	0
5	7.32	82.1	12.88	6.84	0
6	7.27	82.1	12.90	6.84	0
7	7.03	82	12.97	6.84	0
8	6.74	81.8	13.06	6.84	0
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: Arsenic speciation

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: Mam-42
Crew: Louis D. Alice BA
Date/ Time: 2019-07-07 15h00
Weather: 17° cloudy
Observations:

UTM Coordinates: Easting: 60 52 85 Northing: 725 49 40 Waypoint: Mam-42
Total Water Depth: 5,08 Secchi Depth: 4.5m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ml
Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	10,60	107,9	12,01	6,88	0	
1	10,61	108,1	12,02	6,89	0	
2	10,58	107,9	12,04	6,89	0	
3	10,55	107,8	12,06	6,89	0	
4	9,73	106,6	12,20	6,91	0	
5	9,57	105,1	12,27	6,91	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: * New UTM coordinates. Not enough water Depth.

Equipment Blank Collection Notes?

Water Sampling and Limnology

Drive

AREA INFORMATION

Area: LAKE DSI
Sample ID: DSI-33
Crew: ST KM FE
Date/ Time: 2019/07/09 15H30
Weather: CLOUDY / SUNNY
Observations: Ø

UTM Coordinates: Easting: 14W 597504 Northing: 7260925 Waypoint: DSI-33

Total Water Depth: 16 m + Secchi Depth: 8 m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 ML

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	9,82	16,6	11,48	6,71	0
1	9,94	16,6	11,49	6,69	0
2	9,27	16,6	11,50	6,64	0
3	9,21	16,6	11,51	6,62	0
4	9,68	16,7	11,52	6,66	0
5	9,42	16,9	11,57	6,62	0
6	9,10	17,3	11,68	6,62	0
7	8,95	17,5	11,69	6,62	0
8	8,90	17,5	11,67	6,62	0
9	8,29	17,7	11,62	6,62	0
10	8,62	18,7	11,69	6,63	0
11	8,25	18,9	11,83	6,62	0
12	7,97	18,3	11,36	6,62	0
13	7,47	17,5	12,64	6,64	0
14	6,05	17,2	12,16	6,63	0
15	5,69		12,15	6,59	0
16					
17					
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Arsenic speciation collected

Equipment Blank Collection Notes?

Ø

Water Sampling and Limnology

Drive

AREA INFORMATION

Area: LAKE DSI

Sample ID: DSI-34

Crew: ST KM FE

Date/ Time: 2019/07/09 15H15

Weather: CLOUDY / SUNNY

Observations: Ø

UTM Coordinates: Easting: 11W 597332 Northing: 7259597 Waypoint: DSI-34

Total Water Depth: 10,07 Secchi Depth: 8 m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 ml

Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	pH ~~Specific Conductivity~~	CONDUCTIVITY ~~Dissolved Oxygen~~	DISSOLVED OXYGEN	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	10,90	7,8	15,1	10,54	0
1	10,84	7,41	15,1	10,68	0
2	10,85	6,96	15,0	10,85	0
3	10,84	7,03	15,1	10,96	0
4	10,82	6,90	15,1	11,02	0
5	10,82	6,86	15,1	11,07	0
6	10,83	6,83	15,1	11,14	0
7	10,62	6,81	15,3	11,31	0
8	9,95	6,79	15,3	11,31	0
9	9,83	6,78	15,9	11,35	0
10	9,69	6,76	16,1	11,41	0
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Equipment Blank Collection Notes?

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Water Sampling and Limnology

AREA INFORMATION

Area: SP 125 Sample ID: SP-125

Crew: SM TT MAR Date: 2019-07-10 Time: 2:47

Weather: Sunny + overcast/wind NW

Observations: ✓

UTM Coordinates: 14W Easting: 0640121 Northing: 7713910 Waypoint: SP125

Total Water Depth: 7.2 m Secchi Depth:

Phytoplankton collected?: (Yes) No Volume Filtered:

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity
units:	°C		µS/cm	mg/L	NTU
0					
1	8.21	7	38.7	12.61	
2	7.94	7	38.6	12.67	
3	7.71	7	38.8	12.77	
4	7.62	7	38.8	12.74	
5	7.58	7	38.8	12.73	
6	7.50	6.99	38.8	12.73	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes: 100m from ... to mast material

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SP124 Sample ID: SP124

Crew: SM TT MRA Date: 2019-07-10 Time: 3:09pm

Weather: Sunny, overcast + windy MW

Observations: U

UTM Coordinates: MW Easting: 0441032 Northing: 7213475 Waypoint: SP124

Total Water Depth: 6.8 m Secchi Depth:

Phytoplankton collected?: (Yes) No Volume Filtered:

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity
units:	°C		µS/cm	mg/L	NTU
0	—	—	—	—	
1	7.98	6.92	38.8	12.62	
2	7.98	6.91	38.8	12.64	
3	7.98	6.91	38.7	12.66	
4	7.88	6.92	38.9	12.69	
5	7.89	6.93	38.9	12.69	
6	7.84	6.93	38.8	12.71	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE 8
Sample ID: LK8-12
Crew: SL, JL
Date/ Time: 2019-07-12 16:40
Weather: cloudy
Observations:

UTM Coordinates: Easting: 14W 611897 Northing: 7258575 Waypoint: LK8-12

Total Water Depth: 12.20 m Secchi Depth: 8.0 m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L	—	NTU
0	6.92	17.7	12.25	6.89	0
1	6.92	17.7	12.64	6.84	0
2	6.91	17.7	12.85	6.79	0
3	6.87	17.7	12.91	6.75	0
4	6.86	17.6	12.95	6.74	0
5	6.82	17.7	13.00	6.73	0
6	6.81	17.7	13.03	6.72	0
7	6.77	17.7	13.04	6.72	0
8	6.72	17.7	13.04	6.71	0
9	6.72	17.6	13.04	6.72	0
10	6.71	17.6	13.04	6.71	0
11	6.71	17.6	13.05	6.71	0
12	6.70	17.6	13.05	6.71	0
13					
14					
15					
16					
17					
18					
19					
20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes: No As speciation.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE 8
Sample ID: LK8-11
Crew: ST, JL
Date/ Time: 2011-07-12 16:00
Weather: Cloudy
Observations:

UTM Coordinates: Easting: 14W 611093 Northing: 7258849 Waypoint: LK8-11
Total Water Depth: >14m (*14m) Secchi Depth: 10m
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL
Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	6.74	17.6	11.63	7.27	0
1	6.73	17.6	12.59	7.16	0
2	6.60	17.7	12.77	7.06	0
3	6.60	17.7	12.90	6.99	0
4	6.58	17.7	13.07	6.95	0
5	6.58	17.7	13.10	6.90	0
6	6.57	17.7	13.11	6.87	0
7	6.41	17.7	13.14	6.84	0
8	6.21	17.7	13.19	6.82	0
9	6.14	17.7	13.21	6.80	0
10	6.08	17.7	13.23	6.78	0
11	6.00	17.7	13.26	6.76	0
12	6.00	17.7	13.27	6.76	0
13	5.95	17.7	13.28	6.75	0
14	5.89	17.7	13.30	6.74	0
15					
16					
17					
18					
19					
20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes: Arsenic speciation done

Equipment Blank Collection Notes?

Water Sampling and Limnology

Drive.

AREA INFORMATION

Area: LAKE 76
Sample ID: A76-35
Crew: ST SL
Date/ Time: 12:20 2011-07-12
Weather: CLOUDY / Rain
Observations:

UTM Coordinates: Easting: 14W 601939 Northing: 7256732 Waypoint: A76-35
Total Water Depth: >14m (14m +) Secchi Depth: 8m
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500ML
Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	9.86	49.8	11.09	8.02	-2.34	
1	9.86	49.7	11.55	7.86	-2.86	
2	9.75	49.7	11.70	7.64	-2.51	
3	9.76	49.7	11.74	7.52	-2.52	
4	9.77	49.7	11.74	7.48	-2.66	
5	9.72	49.7	11.74	7.40	-2.48	
6	9.71	49.6	11.75	7.36	-2.59	
7	9.71	49.7	11.76	7.33	-2.49	
8	9.76	49.7	11.76	7.31	-2.51	
9	9.68	49.7	11.75	7.29	-2.62	
10	9.70	49.7	11.77	7.25	-2.59	
11	9.63	49.7	11.79	7.21	-2.53	
12	9.62	49.7	11.79	7.19	-2.49	
13	9.62	49.7	11.79	7.17	-2.59	
14	9.57	49.7	11.80	7.16	-2.46	
15						
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17						
18						
19						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: ARSENIC SPECIATION COLLECTED

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake 76
Sample ID: A76-36
Crew: A. JL
Date/ Time: 13:00 2019-07-12
Weather: cloudy
Observations: calm water

UTM Coordinates: Easting: 14W 602129 Northing: 7256983 Waypoint: A76-36

Total Water Depth: 5.20m Secchi Depth: 6.5 m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	9.82	49.6	11.15	7.22	0	
1	9.83	49.6	11.58	7.17	0	
2	9.78	49.7	11.72	7.13	0	
3	9.75	49.7	11.78	7.10	0	
4	9.75	49.7	11.77	7.08	0	
5	9.76	49.6	11.78	7.07	0	
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7						
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19						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: No fish speciation, collected at A76-36

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake 20
Sample ID: A20-35
Crew: [illegible]
Date/ Time: 2015-07-13 13:30
Weather: windy, cloudy
Observations:

UTM Coordinates: Easting: 14W 604524 Northing: 7252545 Waypoint: A20-35

Total Water Depth: ~11m Secchi Depth: 6.0m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	10.31	116.5	11.48	7.13	0
1	10.33	116.5	11.48	7.01	0
2	10.31	116.5	11.48	6.95	0
3	10.30	116.90	11.49	6.90	0
4	10.29	116.90	11.49	6.90	0
5	10.29	116.90	11.49	6.89	0
6	10.29	116.90	11.49	6.85	0
7	10.29	116.90	11.49	6.82	0
8	10.26	116.90	11.50	6.83	0
9	10.26	116.90	11.51	6.82	0
10	9.45	117.90	11.58	6.50	0
11	8.60	116.90	10.103	6.23	0
12					
13					
14					
15					
16					
17					
18					
19					
20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: Arsenic cyanobacteria bloom

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake LC
Sample ID: A20-36
Crew: CW TT CP
Date/ Time: 2019-07-13 14:20
Weather: cloudy windy
Observations:

UTM Coordinates: Easting: 14W 605157 Northing: 7252791 Waypoint: A20-36

Total Water Depth: 5.5m Secchi Depth: 5.0m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes No Photo #s: 5004

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	11.46	16.7	10.99	6.54	0	
1	11.45	16.7	10.98	6.54	0	
2	11.45	16.7	10.99	6.55	0	
3	11.47	16.7	10.99	6.57	0	
4	11.45	16.7	HANG	6.61	0	
5	11.34	16.7	11.02	6.62	0	
6					0	
7					0	
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake
Sample ID: TPE-125
Crew: TK/FH
Date/ Time: 2019-07-13 16:35
Weather: partly cloudy NE 25km/h
Observations:

UTM Coordinates: Easting: 14U 0639033 Northing: 7211517 Waypoint:

Total Water Depth: 7.5m Secchi Depth: N/A

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0						
1	7.73	12.56	28.5	6.84		
2	7.73	12.50	28.5	6.75		
3	7.73	12.51	28.5	6.78		
4	7.72	12.53	28.5	6.76		
5	7.68	12.55	29.0	6.74		
6	7.63	12.57	29.2	6.73		
7	7.60	12.59	29.5	6.73		
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake
Sample ID: TPE-12H
Crew: JK / FH
Date/ Time: 2015-07-13 16:20
Weather: partly cloudy, wind 25 km/h NE
Observations:

UTM Coordinates: Easting: 14N 0659577 Northing: 7212747 Waypoint:

Total Water Depth: 10m Secchi Depth: N/A

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0						
1	7.23	30.1	12.74	6.74		
2	7.22	30.1	12.73	6.77		
3	7.22	30.1	12.73	6.78		
4	7.21	30.1	12.73	6.77		
5	7.20	30.1	12.74	6.75		
6	7.20	30.1	12.74	6.75		
7	7.20	30.1	12.75	6.73		
8	7.19	30.1	12.75	6.74		
9	7.20	30.1	12.75	6.73		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake D1
Sample ID: LK1-11
Crew: ST CP
Date/ Time: 14-07-2019 12:35 PM
Weather: Cloudy ; Sunny
Observations: light rain

UTM Coordinates: Easting: 14W 607564 Northing: 724,9611 Waypoint: LK1-11
Total Water Depth: 8.18 m Secchi Depth: 4.50 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): (Yes) No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	9.31	19.6	11.48	6.99	0
1	9.32	19.6	11.55	6.94	0
2	9.31	19.6	11.60	6.89	0
3	9.31	19.6	11.62	6.86	0
4	9.30	19.6	11.64	6.84	0
5	9.31	19.6	11.63	6.84	0
6	9.28	19.6	11.64	6.84	0
7	9.27	19.5	11.64	6.83	0
8	9.26	19.5	11.64	6.83	0
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Arsenic collected
July Dup-4 collected

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D1
Sample ID: LK1-12
Crew: ST CP
Date/ Time: 14-07-2019 12:00 PM
Weather: Cloudy ; Sunny
Observations: light rain

UTM Coordinates: Easting: 14W 606930 Northing: 7242542 Waypoint: LK1-12
Total Water Depth: 5.60 m Secchi Depth: 4.00 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	9.25	19.5	11.19	7.62	0
1	9.26	19.5	11.56	7.40	0
2	9.25	19.5	11.65	7.30	0
3	9.22	19.5	11.68	7.23	0
4	9.21	19.5	11.69	7.15	0
5	9.18	19.5	11.70	6.97	0
6					
7					
8					
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10					
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12					
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15					
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17					
18					
19					
20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level)
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Wally Lake
Sample ID: WAL-93
Crew: JK/JK
Date/ Time: 2019-07-16
Weather: partly cloudy 20km/hr NE
Observations:

UTM Coordinates: Easting: 15W0361752 Northing: 7221412 Waypoint:

Total Water Depth: 6.25m Secchi Depth: N/A

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0						
1	11.09	35.1	11.30	7.16		
2	11.8	35.1	11.33	7.13		
3	11	35.1	11.58	7.15		
4	10.96	35.1	11.39	7.14		
5	10.88	35.1	11.45	7.15		
6	10.43	35.2	11.55	7.10		
7						
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10						
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18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect **1 L** of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: GPS coordinates are on land, moved 450 meters NW of original point

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Walk Lake
Sample ID: WAL-94
Crew: JK/KA
Date/ Time: 2009-07-16
Weather: partly cloudy, 20km/hr NW
Observations:

UTM Coordinates: Easting: 15W 0361546 Northing: 7221570 Waypoint: WAL-94

Total Water Depth: 7m Secchi Depth: N/A

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0						
1	10.99	35.2	11.08	6.96		
2	10.96	35.2	11.31	7.03		
3	10.91	35.2	11.39	7.09		
4	10.89	35.2	11.44	7.12		
5	10.82	35.2	11.48	7.19		
6						
7						
8						
9						
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11						
12						
13						
14						
15						
16						
17						
18						
19						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect **1 L** of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: GPS coordinates – too shallow, moved 135 meters south of original point

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPN
Sample ID: TPN - 124 (#2)
Crew: NS JT A
Date: 2019-07-23
Time: 15:20
Weather: Cloudy light rain
Observations:
UTM Coordinates: 14W
Easting: 0636958
Northing: 7212174
Waypoint:
Total Water Depth: 6.20
Secchi Depth: /
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 m
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.32	6.94	258	12.92	106.5	
1	6.22	6.91	25.8	12.95	106.4	
2	6.04	6.87	25.7	13.01	106.6	
3	6.03	6.85	25.8	13.04	106.9	
4	6.02	6.85	25.7	13.05	106.9	
5	5.99	6.86	25.8	13.05	106.8	
6	6.01	6.83	25.7	13.04	106.8	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: New location, the original one was on TPE

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPN
Sample ID: TPN-125
Crew: NS JA
Date: 2019-07-23 Time: 14:10
Weather: Cloudy
Observations:
UTM Coordinates: 14W Easting: 0635454 Northing: 7215501 Waypoint:
Total Water Depth: 12.15
Secchi Depth: 1
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.89	7.09	26.1	12.85	107.5	
1	6.89	7.04	26.1	12.87	107.6	
2	6.89	6.96	26.1	12.90	107.8	
3	6.89	6.94	26.1	12.90	107.8	
4	6.85	6.91	26.1	12.91	107.9	
5	6.82	6.92	26.1	12.91	107.9	
6	6.83	6.88	26.1	12.91	107.9	
7	6.82	6.88	26.1	12.91	107.8	
8	6.82	6.87	26.1	12.90	107.8	
9	6.71	6.82	26.1	12.93	107.7	
10	6.78	6.87	26.1	12.95	107.8	
11	6.41	6.86	26.1	13.00	107.7	
12	6.41	6.85	26.0	13.02	107.7	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: BL
Sample ID: BAP-62
Crew: NS, LA, EF
Date: 2019-07-24
Time: 13:56
Weather: Sunny, cloud 8°C ~~wind~~ NO wind
Observations:

UTM Coordinates: Easting: 15N0363938 Northing: 7131074 Waypoint:
Total Water Depth: 15.65 m
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O. %
units:	°C		µS/cm	mg/L	NTU	
0 0.22	4.39	7.00	55.6	13.58		106.6
1	4.20	7.01	56.2	13.57		106.4
2	4.22	6.98	56.2	13.57		106.1
3	4.06	6.98	56.4	13.55		105.7
4	3.93	7.00	58.7	13.59		105.4
5	3.84	7.01	61.9	13.59		105.2
6	3.52	7.00	88.3	13.57		104.2
7	3.51	6.98	116.1	13.57		104.1
8	3.59	6.97	123.1	13.51		103.9
9	3.62	6.96	137.4	13.47		103.6
10	3.45	6.94	167.7	13.49		102.4
11	3.56	6.93	185.9	13.41		103.1
12	3.64	6.90	232.3	13.37		103.0
13	3.68	6.89	250.1	13.36		103.0
14	3.68	6.87	282.2	13.36		103.0
15	3.64	6.86	280.7	13.37		103.0
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: BL
Sample ID: BAP61
Crew: NS, LA, EF
Date: 2019-07-24
Time: 12:26
Weather: clouds, sunny 8°C wind: NW
Observations:

UTM Coordinates: Easting: 15W 0362925 Northing: 7131047 Waypoint:

Total Water Depth: more than 24m
Secchi Depth:

Phytoplankton collected?: (Yes) No
Volume Filtered:

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O %
units:	°C		µS/cm	mg/L	NTU	
0 0.25	3.52	7.00	60.8	13.70		105.2
1	3.51	7.01	60.7	13.71		105.2
2	3.47	7.02	60.9	13.71		105.1
3	3.48	7.01	61.0	13.71		105.0
4	3.41	7.02	61.4	13.71		104.9
5	3.40	7.03	61.4	13.70		104.9
6	3.31	7.03	62.7	13.72		104.8
7	3.35	7.04	61.3	13.69		104.7
8	3.33	7.06	62.0	13.67		104.5
9	3.31	7.07	64.4	13.65		104.2
10	3.28	7.10	65.0	13.56		103.5
11	3.23	7.00	154.7	13.47		102.7
12	3.20	7.02	157.5	13.42		102.2
13	3.12	7.03	180.8	13.37		101.6
14	3.04	6.99	236.4	13.16		100.0
15	2.40	6.93	355.8	12.97		98.3
16	2.64	6.87	511.2	12.40		96.9
17	2.14	6.83	641.0	12.85		95.3
18	1.00	6.73	962.5	13.86		93.8
19	0.85	6.68	1013	13.41		95.3
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: ~~BBD61~~ BL
Sample ID: BBD-61
Crew: NS, LA, EF
Date: 2019-07-24
Time: 11:20 AM
Weather: Windy 20km/h NW 8°C
Observations: ~~windy, clear, warm~~ sunny with cloud
UTM Coordinates: Easting: 14W 0644586 Northing: 7135194
Waypoint:
Total Water Depth: 12.00m
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

(%)

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O mg/L
units:	°C		µS/cm	mg/L	NTU	
0 0.24	4.15	7.06	~~106~~ 47.4	106.6 %		13.66
1 1.00	4.11 ~~[illegible]~~	7.07	48.5	106.4 %		13.68
2 2.08	4.01	7.10	52.4	106.2 %		13.68
3 3.02	4.02	7.10	51	106.1 %		13.70
4 4.03	4.01	7.12	51.5	105.8 %		13.69
5 5.04	3.97	7.10	58	105.3 %		13.71
6 6.01	3.79	7.08	74.5	~~104.4~~ 104.5 %		13.71
7 7.06	3.59	7.07	92	103.1 %		13.78
8	3.50	7.04	153.7	102 %		13.87
9	3.44	7.03	158.5	100.5 %		13.88
10	3.17	7.02	260	98 %		13.86
11	2.13	6.81	656.5	94.5 %		14.08
(12) 12.02	1.84	6.79	~~[illegible]~~ 744.4	~~75%~~ 89.7 %		14.11
13 12.50	1.94	6.72	906.5	73 %		13.62
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: RL

Sample ID: BBD-62

Crew: NS, LA, EF

Date: 2019-07-24

Time: 11:40 am

Weather: Wind: 20 km/h NW 8°C

Observations: Sunny + cloud

UTM Coordinates: Easting: 14W0644485

Northing: 7135375

Waypoint:

Total Water Depth: 6.44

Secchi Depth:

Phytoplankton collected?: (Yes) No

Volume Filtered:

Field DUP collected?: Yes (No)

Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O %
units:	°C		µS/cm	mg/L	NTU	
0 0.23	4.13	7.02	50.2	13.63		106.4
1	4.13	7.05	51.3	13.63		106.3
2	3.98	7.00	53	13.64		106.1
3	3.98	6.97	53.4	13.62		105.8
4	3.85	6.97	64	13.61		105.5
5	3.78	6.94	80.5	13.64		105.4
6	3.74	6.93	47.5	13.66		~~105~~ 105.4
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: BL
Sample ID: BPJ-62
Crew: NS, LA, EF
Date: 2019-07-24
Time: 12:47
Weather: 8°C clouds wind: NW
Observations:
UTM Coordinates: Easting: 15W 0357104 Northing: 7134072 Waypoint:
Total Water Depth: 15.57 m
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O %
units:	°C		µS/cm	mg/L	NTU	
0 0.30	3.91	6.98	129.4	13.54		105.0
1	3.91	6.99	127.6	13.52		104.8
2	3.81	7.00	137.6	13.52		104.7
3	3.72	7.00	139.6	13.54		104.4
4	3.61	7.00	143.6	13.50		104.1
5	3.55	7.01	158.0	13.53		103.9
6	3.53	7.02	156.8	13.49		103.6
7	3.47	7.01	162.1	13.46		103.4
8	3.43	7.02	183.1	13.36		102.4
9	3.29	6.98	206	13.23		101.3
10	3.21	6.97	267.9	13.16		100.4
11	2.83	6.90	403.6	13.16		99.3
12	2.70	6.88	459	13.10		98.4
13	2.31	6.83	572.5	13.02		96.9
14	2.29	6.81	622.5	13.04		97.0
15	1.02	6.67	942.3	13.27		95.5
16 15.57						
17						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Close to BL port

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: BL
Sample ID: BPJ-61
Crew: NS, LA, EF
Date: 2019-07-24
Time: 12:20
Weather: 80C sunny, clouds wind: NW
Observations:
UTM Coordinates: Easting: 15W0356445 Northing: 7134082 Waypoint:
Total Water Depth: more then 24 m
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered:
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	D.O %
units:	°C		µS/cm	mg/L	NTU	
0 0.22	3.88	7.02	34.1	13.65		105.8
1	3.83	7.05	34.5	13.67		105.7
2	3.80	7.06	35.6	13.67		105.7
3	3.83	7.08	36.4	13.65		105.6
4	3.84	7.09	39.0	13.62		105.4
5	3.84	7.10	38.1	13.61		105.4
6	3.85	7.13	38.5	13.59		105.2
7	3.85	7.13	40.9	13.58		105.1
8	3.82	7.13	43.4	13.57		105.0
9	3.80	7.15	46.6	13.54		104.7
10	3.77	7.18	53	13.48		104.3
11	3.73	7.20	57.8	13.30		102.7
12	3.16	7.07	237	13.04		99.4
13	2.56	6.95	446.1	12.89		97.3
14	2.24	6.92	569	12.90		95.9
15	1.26	6.83	919.7	12.85		93.0
16	1.08	6.82	976.3	12.88		92.8
17	0.78	6.79	1073	13.02		92.9%
18	0.74	6.76	1097	13.16		92.9%
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: ~~[illegible]~~ ~~GA~~ Barge passé à côté.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake - D5 Sample ID: LKS-11

Crew: L.D - FL Date: 2019-07-24 Time: 13H20

Weather: WIND - overcast

Observations:

UTM Coordinates: Easting: 613019 Northing: 7251823 Waypoint: LKS-11

Total Water Depth: 7,41 Secchi Depth: 5,5 m

Phytoplankton collected?: (Yes) No Volume Filtered: 500M

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	12,25	7,43	32,8	10,47	0	
1	12,19	7,41	32,7	10,51	0	
2	12,12	7,41	32,7	10,68	0	
3	12,12	7,43	32,7	10,41	0	
4	12,00	7,51	32,7	10,55	0	
5	12,08	7,47	32,7	10,54	0	
6	11,99	7,51	32,7	10,25	0	
7	12,11	7,47	33	9,47	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level):	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of Lugol's back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS
Sample ID: LKS-12
Crew: L.D - FL
Date: 2019-07-24
Time: 13H50
Weather: overcast - wind
Observations:
UTM Coordinates: Easting: 612 213 Northing: 7252 Waypoint: LKS-12
Total Water Depth: 5.06 M
Secchi Depth: 5.00
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ML
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	12.29	7.35	32.6	10.28	0	
1	12.28	7.32	32.8	10.33	0	
2	12.29	7.30	32.8	10.36	0	
3	12.29	7.25	32.8	10.37	0	
4	12.29	7.24	32.8	10.38	0	
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12		5.06	bottom			
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Ploodream Lake
Sample ID: PDL 78
Crew: FL ABA KM
Date: 2019-07-28
Time: 14:40
Weather: Cloud & Sun
Observations:

UTM Coordinates: Easting: 630 752 Northing: 722 3098 Waypoint:

Total Water Depth: 7 15
Secchi Depth: 7

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ML

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.97	7.12	22.9	12.37	0	
1	6.95	7.11	22.9	12.37	0	
2	6.93	7.09	22.9	12.39	0	
3	6.95	7.07	22.9	12.38	0	
4	6.94	7.07	22.9	12.39	0	
5	6.91	7.06	22.9	12.41	0	
6	6.96	7.05	22.9	12.43	0	
7	6.96	7.06	22.9	12.44	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, ~~low~~ level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Pine Island Lake Sample ID: 77PDL

Crew: Alice & Allard, Family Lapointe, Kevin Vantee Date: 2019-07-28 Time: 14 00

Weather: Cloud & Sun

Observations:

UTM Coordinates: Easting: 0629713 Northing: 7224760 Waypoint:

Total Water Depth: 7.33 Secchi Depth: 7

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ML

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.10	7.25	23	12.27	0	
1	7.10	7.20	22.9	12.11	0	
2	7.08	7.15	23	12.29	0	
3	7.07	7.14	22.9	12.32	0	
4	7.08	7.12	22.9	12.31	0	
5	7.05	7.11	22.9	12.32	0	
6	7.05	7.11	22.9	12.32	0	
7	7.08	7.07	23	12.32	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Moved location a bit as it was almost on shore and not deep enough.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-112
Crew: LD-ABA-KM
Date: 2018-07-29
Time: 15:19
Weather: 11°C Cloudy
Observations:

UTM Coordinates: Easting: 622716 Northing: 7216899 Waypoint: INUG-112

Total Water Depth: 5.15
Secchi Depth: 5.15

Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml

Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	9.95	6.97	14.7	11.42	0	
1	9.94	6.96	16.3	11.44	0	
2	9.93	6.97	16.3	11.45	0	
3	9.93	6.91	16.3	11.45	0	
4	9.9	6.9	16.3	11.47	0	
5	9.85	6.9	16.3	11.47	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-113
Crew: 2D-ABA-KM
Date: 2015-07-29
Time: 14:55
Weather: 16°C cloudy
Observations:

UTM Coordinates: Easting: 622463 Northing: 7215544 Waypoint: INUG-113

Total Water Depth: 10.22
Secchi Depth: 7.5

Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml

Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	9.81	7.75	16.3	11.02	0	
1	9.77	7.20	16.3	11.16	0	
2	9.77	7.13	16.3	11.29	0	
3	9.77	7.09	16.3	11.33	0	
4	9.75	7.02	16.3	11.37	0	
5	9.73	7.05	16.3	11.40	0	
6	9.73	7.03	16.3	11.41	0	
7	9.71	7.02	16.3	11.41	0	
8	9.7	7	16.3	11.41	0	
9	9.7	6.99	16.2	11.4	0	
10	9.7	6.97	16.3	11.4	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: DS1
Sample ID: DS1-36
Crew: ME-JG
Date/ Time: AUG 17, 2019 13:44
Weather:
Observations:

UTM Coordinates: Easting: 14W0597755 Northing: 7258637 Waypoint: 026
Total Water Depth: 7.9 Secchi Depth: 2.1
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL ?
Field DUP collected? (Circle one): Yes No Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	13.5	21.7	10.33	7.0	
1	13.5	21.7	10.3	7.0	
2	13.4	21.8	10.3	7.0	
3	13.4	21.8	10.3	6.9	
4	13.4	21.8	10.28	6.9	
5	13.3	21.7	10.29	6.9	
6	13.3	21.5	10.31	6.9	
7	13.3	21.5	10.34	6.9	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: See secchi border to filter
* Confirm which DS1 sample was filtered 250 mL for chla

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WTS

Sample ID: WTS 44

Crew: MF . JC

Date/ Time: AUG 18, 2019 15:37

Weather/Obervations:

UTM Coordinates: Easting: 14W0607232 Northing: 7253566 Waypoint: ~~7253566~~ 033

Photo #s: Field DUP collected? (Circle one): Yes No

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.4	80.2	10.71	7.3		
1	13.4	80.2	10.71	7.3		
2	13.4	80.0	10.7	7.3		
3	13.4	80.3	10.7	7.2		
4	13.1	80.3	10.1	7.2		
5	13.1	80.3	10.1	7.1		
6	13.1	80.3	10.1	7.1		
7	13.1	80.1	10.06	7.1		
8	12.9	80.3	9.94	7.1		
9	12.8	80.0	9.89	7.1		
10	12.2	81.0	9.8	7.0		
11	12.1	81.2	9.82	7.1		
12	12.1	81.2	9.73	7.1		
13	12.0	81.3	9.74	7.1		
14	12.0	81.3	9.80	7.1		
15	12.0	81.3	9.87	7.1		
16	12.0	81.4	9.93	7.1		
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BOTTLE CHECKLIST

ALS - send Express	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
ALS - send Ground	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 125 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **3 drops** of **Lugol's** back at the lab)

Total Water Depth: 17 m Secchi Depth: 2.6

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG - 114
Crew: E. Franz, M. DiMauro
Date/ Time: 15 Aug 19 14:00
Weather: Sunny 16-18°C, No wind
Observations:

UTM Coordinates: Easting: 14W 0622565 Northing: 7215133 Waypoint: 032

Total Water Depth: 10.9 Secchi Depth: 10.2 m

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.2	15.7	9.71	7.03		
1	12.4	15.6	9.77	7.03		
2	12.2	15.6	10.01	7.00		
3	12.0	15.7	10.09	7.01		
4	12.0	15.6	10.04	6.98		
5	11.9	15.6	10.05	7.00		
6	11.9	15.6	10.06	6.98		
7	11.9	15.6	10.03	7.00		
8	11.9	15.6	9.90	6.99		
9	11.9	15.6	10.07	6.98		
10	11.8	15.7	9.76	6.97		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Calibration: Spcond: 1381 µS/cm ✓ pH 7 = 7.04 ✓ pH 4 = 4.04 ✓ pH 10 = 10.36 ✓

No need to anchor. No As Speciation.

Equipment Blank Collection Notes?

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Water Sampling and Limnology

AREA INFORMATION

Area: A20
Sample ID: A20-38
Crew: MF + JE
Date/ Time: AUG 16, 2019 10:46 am
Weather: sunny winds SE 10-15
Observations:

UTM Coordinates: Easting: 14W0604136 Northing: 7252591 Waypoint: 012
Total Water Depth: 10.8 Secchi Depth: 6.0 m
Phytoplankton collected? (Circle one): Yes (Yes circled) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No (No circled) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.0	12.9	10.5	6.8		
1	13.0	12.9	10.5	6.8		
2	13.0	12.9	10.5	6.8		
3	13.0	12.9	10.5	6.8		
4	12.9	12.9	10.4	6.7		
5	12.5	12.9	10.5	6.7		
6	12.4	12.9	10.4	6.7		
7	12.3	12.9	10.5	6.7		
8	12.3	13.0	10.5	6.6		
9	12.1	13.0	10.3	6.7		
10	12.1	13.0	10.6	6.6		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: SPECIATION.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake - East Basin
Sample ID: TPE-127
Crew: E. Franz, L. Archambault
Date/ Time: 13 Aug 2019 17:20
Weather: See Previous
Observations: -

UTM Coordinates: Easting: HW 639569 Northing: 7210471 Waypoint: 012 76CX
Total Water Depth: 16.0 m Secchi Depth: 9 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	11.6	30.5	10.47	7.44	
1	11.6	30.5	10.39	7.44	
2	11.6	30.5	10.34	7.44	
3	11.6	30.6	10.31	7.44	
4	11.6	30.5	10.33	7.45	
5	11.6	30.5	10.31	7.44	
6	11.6	30.5	10.38	7.44	
7	11.6	30.6	10.28	7.44	
8	11.6	30.5	10.37	7.43	
9	11.6	30.6	10.36	7.44	
10	11.6	30.6	10.33	7.43	
11	11.6	30.5	10.15	7.44	
12	11.6	30.5	10.34	7.43	
13	11.5	30.5	~~10~~ 10.26	7.43	
14	11.5	30.5	10.41	7.43	
15	11.5	30.4	10.12	7.43	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: Wally Lake (WAL)
Sample ID: WAL 95
Crew: EF, IT
Date/ Time: 11 Aug 2019 12:50
Weather: Overcast, rain, winds N @ 30-40 km/hr. Unpleasant!
Observations:

UTM Coordinates: Easting: 5W 360993 Northing: 7021919 Waypoint: 006 (76 ✗)

Total Water Depth: 6.8m Secchi Depth: too windy

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.1	36.1	10.62	7.28		
1	12.1	36.1	10.42	7.28		
2	12.1	36.0	10.53	7.27		
3	12.1	36.1	10.46	7.26		
4	12.1	36.1	10.56	7.26		
5	12.1	36.1	10.53	7.24		
6	12.1	36.1	10.55	7.24		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Random coordinate was on land. Moved to a new location.
Unhooked the anchor and nylon line here (wedged in rocks).

Equipment Blank Collection Notes?

–

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake.
Sample ID: BBD-63
Crew: MF, MD, (OD).
Date/ Time: AUG 12 16:51
Weather: NNW 20-25
Observations:

UTM Coordinates: Easting: 14W 0644694 Northing: 7135113 Waypoint: 054

Total Water Depth: 13.1 Secchi Depth: See BBD-64

Phytoplankton collected? (Circle one): Yes (Yes circled) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No (No circled) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	7.6	44.9	12.03	7.09		
1	7.6	43.9	11.95	7.09		
2	7.6	43.6	11.92	7.10		
3	7.6	42.0	11.94	7.11		
4	7.6	41.8	11.92	7.12		
5	7.5	41.8	11.91	7.13		
6	7.5	40.9	11.99	7.15		
7	7.4	41.4	11.79	7.18		
8	7.2	64.4	11.89	7.14		
9	6.9	76.2	11.91	7.13		
10	6.9	105.3	12.04	7.06		
11	6.9	109.0	12.34	7.07		
12	6.9	112.8	12.29	7.08		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake
Sample ID: BPJ-63
Crew: MF, CF, MD.
Date/ Time: Aug 12 2019. 16:11
Weather: winds NNW 20-25.
Observations:

UTM Coordinates: Easting: 15W0357218 Northing: 7134078 Waypoint: 52
Total Water Depth: 11.0 Secchi Depth: See BPJ-64
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	7.9	63.6	12.26	7.05		
1	7.7	64.0	12.25	7.02		
2	7.6	64.6	12.24	7.01		
3	7.5	65.6	12.22	7.01		
4	7.5	66.6	12.23	7.01		
5	7.4	68.0	12.32	7.01		
6	7.3	70.6	12.23	7.02		
7	7.3	81.2	12.25	7.01		
8	7.2	86.3	12.26	7.01		
9	7.1	90.6	12.43	7.00		
10	7.1	99.0	12.43	7.06		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Specific cond. double checked.

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: BAP-63 Baker Lake
Sample ID: BAP-63
Crew: MF MD EF
Date/ Time: AUG 12 2019 @ 13:20
Weather: Cloudy, light wind
Observations:

UTM Coordinates: Easting: 0363015 Northing: 7131130 Waypoint: 046 13:20

Total Water Depth: 33.4 m Secchi Depth: 3.5 m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No Photo #s: None

DUP-1

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	8.4	34.5	11.95	7.03		
1	8.4	34.5	12.01	7.02		
2	8.4	33.6	~~11.98~~ 11.93	7.02		
3	8.4	33.6	11.95	7.03		
4	8.4	33.6	11.91	7.03		
5	8.3	34.1	11.86	7.03		
6	8.4	33.7	12.00	7.01		
7	8.3	33.7	11.92	7.01		
8	8.3	33.8	11.96	7.01		
9	8.3	34.2	11.89	7.00		
10	8.2	34.5	11.97	7.00		
11	8.1	34.7	11.94	7.01		
12	8.1	34.5	11.77	6.98		
13	7.9	32.7	11.91	6.97		
14	7.8	31.8	11.93	6.90		
15	7.6	38.0	12.02	6.87		
16	7.6	46.9	11.98	6.80		
17	7.6	49.4	11.98	6.78		
18	7.6	54.6	11.96	6.78		
19	7.5	58.9	12.04	6.79		
20	7.4	60.7	12.04	6.81		

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes?

NA

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake - North Basin
Sample ID: TPN-127
Crew: E. Franz, L. Archambault
Date/ Time: 13 Aug 2019 10:00
Weather: overcast, dead calm, 12°C
Observations: Didn't need to anchor.

UTM Coordinates: Easting: 14W 635568 Northing: 7216056 Waypoint: 008 76Cx

Total Water Depth: 14.7 m Secchi Depth: 10.5 m (very clear)

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): (Yes) No Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	9.7	26.5	11.03	7.76		
1	9.5	26.5	11.22	7.79		
2	9.5	26.4	11.16	7.76		
3	9.4	26.4	11.04	7.71		
4	9.4	26.4	11.25	7.66		
5	9.3	26.4	11.35	7.65		
6	8.9	26.5	11.47	7.67		
7	8.8	26.4	11.44	7.60		
8	8.7	26.4	11.57	7.57		
9	8.6	26.4	11.40	7.53		
10	8.5	26.4	11.60	7.51		
11	8.4	26.4	11.65	7.48		
12	8.4	26.3	11.71	7.45		
13	8.4	26.3	11.53	7.43		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

DUP-2 collected here
pH at 3m ⇒ 7.62 ✓
Spill respare boat 50 yamaha quit (wouldn't start) paddled to shore.

Equipment Blank Collection Notes?

–

Water Sampling and Limnology

AREA INFORMATION

Area: SP (South Portag Lake)
Sample ID: SP-127
Crew: MD, LA, IT, DM..
Date/ Time: AUG 14, 2019. 11:30
Weather/Obervations: Overcast, warm SE @ ~10 km/hr (or less)

UTM Coordinates: Easting: 14W 0640599 Waypoint: 018
Northing: 7213413

Photo #s: None Field DUP collected? (Circle one): Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.2	38.0	10.54	8.39		
1	12.1	38.1	10.62	8.20		
2	12.0	37.9	10.52	8.07		
3	12.0	38.0	10.43	7.81		
4	12.0	38.0	10.36	7.75		
5	12.0	38.0	10.42	7.44		
6	12.0	38.0	10.32	7.60		
7	12.0	38.0	10.24	7.56		
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BOTTLE CHECKLIST

ALS - send Express	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
ALS - send Ground	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 125 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **3 drops** of **Lugol's** back at the lab)

Total Water Depth: 7.7 Secchi Depth: 4.0

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field Notes:

Equipment Blank Collection Notes? NA

Water Sampling and Limnology

AREA INFORMATION

Area: PDL
Sample ID: PDL-79
Crew: E. Franz, M. Finley
Date/ Time: 14 AUG 2019 14:45
Weather: Overcast, flat calm, 15 °C
Observations:

UTM Coordinates: Easting: 14W 631488 Northing: 7224214 Waypoint: 062
Total Water Depth: 27.0m Secchi Depth: –
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL
Field DUP collected? (Circle one): (Yes) No Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	10.9	21.6	11.54	7.20	
1	10.5	21.6	11.64	7.21	
2	10.1	21.6	11.73	7.17	
3	9.8	21.4	11.81	7.17	
4	9.8	21.5	11.82	7.14	
5	9.7	21.5	11.82	7.15	
6	9.7	21.6	11.81	7.12	
7	9.7	21.5	11.81	7.11	
8	9.6	21.5	11.82	7.11	
9	9.6	21.5	11.80	7.10	
10	9.5	21.5	11.83	7.08	
11	9.3	21.4	11.87	7.09	
12	9.3	21.5	11.87	7.08	
13	9.3	21.4	11.88	7.08	
14	9.2	21.5	11.88	7.07	
15	9.2	21.5	11.88	7.07	
16	9.2	21.5	11.90	7.06	
17	9.1	21.5	11.90	7.06	
18	9.1	21.5	11.91	7.06	
19	9.1	21.5	11.92	7.05	
– 20					

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

DUP-4 collected here.
The manta probe is too short to safely collect 20m measurements.

Equipment Blank Collection Notes?

–

Water Sampling and Limnology

AREA INFORMATION

Area: NSM - 44

Sample ID:

Crew: MF MD

Date/ Time: AUG 20, 2019 1430

Weather: calm

Observations:

UTM Coordinates: Easting: 14W 0606987 Northing: 7257841 Waypoint: 86

Total Water Depth: 13.8 Secchi Depth: —

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: Na

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.8	59.4	11.36	7.35		
1	12.8	59.4	11.23	7.34		
2	12.7	59.4	11.52	7.33		
3	12.7	59.5	11.28	7.33		
4	12.7	59.4	11.34	7.33		
5	12.6	59.5	11.64	7.32		
6	12.6	59.5	11.42	7.32		
7	12.6	59.5	11.16	7.3		
8	12.5	59.4	11.39	7.3		
9	12.5	59.3	11.06	7.3		
10	12.5	59.1	11.22	7.29		
11	12.3	59.3	11.11	7.25		
12	12.1	59.1	10.98	7.24		
13	12.1	59.1	10.80	7.24		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: - EB + DI collected in boat after water collected for NSM 44
- DI from April + July. month July.
- arsenic speciation here

Equipment Blank Collection Notes? see above

Water Sampling and Limnology

AREA INFORMATION

Area: A76.
Sample ID: A76-37
Crew: MF - J
Date/ Time: Aug 15, 2019 11:46.
Weather: Very calm + clear.
Observations:

UTM Coordinates: Easting: 14W 0601738 Northing: 7256860 Waypoint: 063

Total Water Depth: 13.5 m Secchi Depth: 9.2 m

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No DUP 3 Photo #s: ~

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.7	39.2	10.7	7.2		
1	12.5	39.2	10.7	7.1		
2	12.5	39.2	10.7	7.1		
3	12.5	39.2	10.7	7.1		
4	12.4	39.3	10.7	7.1		
5	12.4	39.3	10.7	7.1		
6	12.4	39.3	10.7	7.1		
7	12.4	39.3	10.7	7.1		
8	12.4	39.2	10.7	7.0		
9	12.4	39.2	10.7	7.0		
10	12.4	39.1	10.7	7.0		
11	12.4	39.2	10.7	7.0		
12	12.3	39.2	10.7	7.0		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: As Speciation + As speciation DUP

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LK8

Sample ID: LK8-13

Crew: MK + JE

Date/ Time: AUG 16, 2019

Weather:

Observations:

UTM Coordinates: Easting: 14W0612076 Northing: 7258446 Waypoint: 020

Total Water Depth: 5.8 Secchi Depth:

Phytoplankton collected? (Circle one): Yes No Volume Filtered: ~~500 mL~~ 250 mL !!!

Field DUP collected? (Circle one): Yes No Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.3	13.4	11.0	6.9		
1	12.3	13.4	11.0	6.9		
2	12.3	13.4	11.0	6.9		
3	12.3	13.4	11.0	6.8		
4	12.3	13.4	11.0	6.8		
5	12.2	13.4	11.0	6.7		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Arsenic SPECIATION

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake 5
Sample ID: LkS-14
Crew: E. Franz, M. DiMauro
Date/ Time: 16 Aug 2019 13:40
Weather: Overcast light wind SW @ 5-10 km/hr, 13°C
Observations:

UTM Coordinates: Easting: 14W 612569 Northing: 7251400 Waypoint: 039

Total Water Depth: 6.9 m Secchi Depth: —

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.1	24.6	9.93	7.38		
1	13.1	24.6	9.82	7.39		
2	13.1	24.6	9.83	7.38		
3	13.1	24.6	9.79	7.38		
4	13.0	24.6	9.80	7.37		
5	12.9	24.6	9.89	7.36		
6	12.8	24.7	9.70	7.37		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	✓	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	✓	TSS (low level), TDS (low level)	
	1 x 125 mL amber	✓	TOC, total P, NH3, TKN	
	1 x 125 mL amber	✓	DOC	
	1 x 145 mL plastic	✓	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	✓	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	✓	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	✓	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass		Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:
No As. Spectrum
Anchored to stay in station

Equipment Blank Collection Notes?
—

Water Sampling and Limnology

AREA INFORMATION

Area: MMM

Sample ID: MMM-43

Crew: MF + MD

Date/ Time: Aug 20 11:14

Weather: winds ENE 15 km

Observations: - Dust blowing into this end of lake from mine.

UTM Coordinates: Easting: 14N0605393 Northing: 7255097 Waypoint: 84

Total Water Depth: 8.3 Secchi Depth: 3.5 m.

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.1	111.1	12.03	7.49		
1	13.1	111.1	12.01	7.49		
2	13.1	111.1	11.50	7.48		
3	13.1	111.2	11.37	7.48		
4	13.1	112.0	11.26	7.47		
5	13.0	113.1	11.13	7.46		
6	13.0	113.3	10.91	7.46		
7	12.9	117.4	10.81	7.44		
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14		No stratification	so no	second	sample.	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: calibrated pH, DO, + cond this morning

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LK1
Sample ID: LK1-13
Crew: E. Franz, M. DiMauro
Date/ Time: 17 AUG 2019 16:15
Weather: Partly cloudy, 15°C, light SE wind @ < 15 Km/hr
Observations:

UTM Coordinates: Easting: 14W 0609501 Northing: 7249256 Waypoint: 046
Total Water Depth: 5.6 m Secchi Depth: 4.5 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.6	13.6	10.19	6.95		
1	13.6	13.7	10.16	6.95		
2	13.6	13.7	10.07	6.94		
3	13.6	13.7	10.17	6.95		
4	13.6	13.7	10.18	6.94		
5	13.6	13.7	10.11	6.94		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:
YSI ProPlus Cal. pH7 = 7.01, pH4 = 4.08, pH10 = 10.24 ✓ SpCond = 1427 ✓
The entire NE basin is quite shallow. Past the island depths were generally < 5 m. Only a few areas > 5 m.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LK1
Sample ID: LK1-14
Crew: E. Franz, M. DiMauro
Date/ Time: 17 Aug 2019 17:00
Weather:
Observations:

UTM Coordinates: Easting: 14W 0606080 Northing: 7244204 Waypoint: 047 7600

Total Water Depth: 6.1 m Secchi Depth: –

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.9	13.7	10.51	6.98		
1	12.9	13.7	10.37	6.97		
2	12.9	13.7	10.46	6.97		
3	12.8	13.7	10.34	6.96		
4	12.8	13.7	10.41	6.97		
5	12.8	13.7	10.38	6.97		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

As Spec. collected here

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: MSM
Sample ID: MSM - 44
Crew: ME + MD.
Date/ Time: AUG 20 10:51
Weather: wind ENE 15km sunny
Observations:

UTM Coordinates: Easting: 14W 0604145 Northing: 7253925 Waypoint: 83
Total Water Depth: 6.0 Secchi Depth: –
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.1	81.5	11.85	7.39		
1	13.1	81.4	12.01	7.40		
2	13.1	81.5	11.47	7.39		
3	13.1	81.4	11.38	7.39		
4	13.1	81.4	11.12	7.39		
5	13.1	81.4	10.43	7.39		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Arsenic speciation collected here

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LK5
Sample ID: LK5-13
Crew: E Franz, M. DiNauro
Date/ Time: 16 Aug 2019, 14:15 pm
Weather: overcast, S wind @ 10 km/hr gusting to 15 km/hr. 10-12°C.
Observations:

UTM Coordinates: Easting: KW 0612337 Northing: 7252518 Waypoint: 040
Total Water Depth: 8.3 m Secchi Depth: NA
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.0	24.9	9.91	7.41		
1	13.0	24.9	9.92	7.42		
2	13.0	24.9	9.85	7.40		
3	13.0	24.9	9.76	7.41		
4	13.0	24.9	9.65	7.41		
5	12.9	24.8	9.67	7.40		
6	12.9	24.9	9.70	7.36		
7	12.8	24.9	9.76	7.34		
8	12.5	25.0	9.63	7.35		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:
pH confirmation: pH 7 = stable at 6.96 to 6.97. ✓ DO calibration = 94.5%
Arsenic speciation collected here.

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: LK8-
Sample ID: LK8-14
Crew: MF + JF
Date/ Time: Aug 16, 2019
Weather: winds S 15km 15:24
Observations:

UTM Coordinates: Easting: 14W 0610646 Northing: 7258723 Waypoint: 019
Total Water Depth: 12.2 Secchi Depth: 8.5
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500mL
Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	12.5	13.5	10.9	6.9	
1	12.4	13.5	10.9	7.0	
2	12.4	13.5	10.9	6.9	
3	12.4	13.5	10.9	6.9	
4	12.2	13.5	10.9	6.9	
5	12.1	13.5	10.9	6.8	
6	11.8	13.4	11.0	6.8	
7	11.8	13.4	11.0	6.8	
8	11.8	13.4	11.0	6.8	
9	11.7	13.4	11.0	6.8	
10	11.7	13.4	11.0	6.8	
11	11.8	13.4	11.0	6.8	
12					
13					
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: SPECTATOR

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: A76
Sample ID: A76-38
Crew:
Date/ Time: AUG 15, 2019 12:35
Weather: calm
Observations:

UTM Coordinates: Easting: 14W 0602656 Northing: 7257095 Waypoint: 064

Total Water Depth: 10.2 Secchi Depth: –

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): Yes (No) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	12.8	39.7	10.7	7.2	
1	12.6	39.8	10.7	7.2	
2	12.5	39.8	10.7	7.1	
3	12.5	39.9	10.7	7.1	
4	12.4	39.9	10.7	7.1	
5	12.4	39.9	10.7	7.1	
6	12.4	39.9	10.7	7.1	
7	12.4	39.7	10.7	7.1	
8	12.3	39.7	10.7	7.1	
9	12.3	40.3	10.7	7.0	
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19					
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Nemo Lake.
Sample ID: NEM - 43
Crew: M. Finley, M. DiMauro
Date/ Time: Aug 20, 15:09.
Weather:
Observations:

UTM Coordinates: Easting: 14W 0606234 Northing: 7257496. Waypoint: 087

Total Water Depth: 14.2 Secchi Depth: 8M

Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes No Photo #s: Na.

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.9	59.3	11.53	7.39		
1	12.9	59.3	11.61	7.39		
2	12.9	59.4	11.61	7.38		
3	12.9	59.4	11.52	7.39		
4	12.9	59.4	11.43	7.39		
5	12.9	59.4	11.50	7.39		
6	12.9	59.3	11.43	7.38		
7	12.8	59.3	11.43	7.38		
8	12.8	59.3	10.95	7.38		
9	12.8	59.4	11.42	7.38		
10	12.8	59.4	11.25	7.38		
11	12.8	59.4	11.26	7.39		
12	12.8	59.4	11.27	7.39		
13	12.8	59.4	11.18	7.4		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: PDL
Sample ID: PDL-80
Crew: E. Franz, M. Findey
Date/ Time: 14 Aug 2019 14:30
Weather:
Observations:

UTM Coordinates: Easting: 14W 631876 Northing: 7223965 Waypoint: 060

Total Water Depth: 7.0 m Secchi Depth: To bottom

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500mL

Field DUP collected? (Circle one): (Yes) (No) Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	10.6	21.6	11.60	7.30		
1	10.6	21.6	11.60	7.22		
2	10.1	21.6	11.68	7.22		
3	9.9	21.5	11.72	7.17		
4	9.9	21.5	11.72	7.16		
5	9.9	21.6	11.70	7.14		
6	9.7	21.5	11.68	7.12		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

~~DUP 3 collected here.~~ Dup not collected here.
Arsenic Speciation collected here.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SP (South Portage Lake)
Sample ID: SP-126
Crew: MD, LA, IT, DM
Date/ Time: AUG 14, 2019, 12:18
Weather/Obervations: overcast, winds SE (@ 10 km/hr (or less)

UTM Coordinates: Easting: 14W 0639972 Waypoint: 19
~~1218~~ Northing: 7213665

Photo #s: None Field DUP collected? (Circle one): Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.2	37.8	10.54	7.94		
1	12.1	38.2	10.47	7.89		
2	12.0	38.3	10.42	7.84		
3	12.0	38.3	10.34	7.81		
4	12.0	38.3	10.33	7.78		
5	12.0	38.3	10.26	7.75		
6	12.0	38.3	10.19	7.73		
7	12.0	38.4	10.20	7.71		
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BOTTLE CHECKLIST

ALS - send Express	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
ALS - send Ground	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 125 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **3 drops** of **Lugol's** back at the lab)

Total Water Depth: 7.0 Secchi Depth: 4.25

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field Notes: Location was too deep ~18 m, so moved closer to land.

Equipment Blank Collection Notes? — NA

Calibration AUG 14, 2019

	PH	Sp.C	DO (mg/L)
	7.10	~~1443~~	8.59
	3.77	1360	
	10.02		

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake - North Basin
Sample ID: TPN-126
Crew: E. Franz, L. Archambault
Date/ Time: 13 Aug 2019 15:15
Weather: Overcast, light wind SE (<5 km/hr).
Observations: -

UTM Coordinates: Easting: 14W 636309 Northing: 7214389 Waypoint: 010 76CX
Total Water Depth: 10.1 m Secchi Depth: 9.0m light ripples
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	9.0	27.8	11.69	7.15		
1	9.0	27.7	11.76	7.15		
2	9.0	27.8	11.50	7.16		
3	8.9	27.8	11.65	7.15		
4	8.9	27.8	11.67	7.14		
5	8.8	27.8	11.61	7.11		
6	8.8	27.7	11.67	7.10		
7	8.8	27.7	11.69	7.04		
8	8.6	27.7	11.83	7.04		
9	8.6	27.7	11.84	7.02		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:
Calibration values: Sp: 1386 µS/cm, pH 7 = 6.71, pH 4 = 3.99, pH10 = 9.88
DO% =

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: BAP - 64
Sample ID:
Crew: MF . MP . CF
Date/ Time: AUG 12 2019.
Weather: overcast . winds NNW 15 km.
Observations:

UTM Coordinates: Easting: 15W 0363816 Northing: 7131188 Waypoint: 045
Total Water Depth: 10.4 m. Secchi Depth: 3.5 m
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No Photo #s: None

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	8.5	58.4	11.95	7.00		
1	8.5	57.9	11.78	7.00		
2	8.5	57.7	11.92	6.99		
3	8.4	~~50.~~ 46.80	11.85	7.03		
4	8.2	44.4	11.89	6.97		
5	8.1	41.2	11.81	6.96		
6	8.0	39.8	11.82	6.92		
7	8.0	39.2	12.00	6.89		
8	7.9	40.4	11.93	6.85		
9	7.8	51.0	11.92	6.80		
10	7.8	50.1	11.93	6.80		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

NA.

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake.
Sample ID: BPS-64
Crew: MK, MD, ET
Date/ Time: Aug 12 2014
Weather: windy 15-20.
Observations:

UTM Coordinates: Easting: 15W0256709 Northing: 7134281 Waypoint: 053
Total Water Depth: 15.0 Secchi Depth: ~~4.25~~ 5 m
Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes (No) Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	7.6	64.6	12.08	7.06		
1	7.6	65.1	12.02	7.07		
2	7.6	65.4	12.04	7.07		
3	7.6	65.8	12.06	7.07		
4	7.6	65.6	12.07	7.07		
5	7.5	65.7	12.16	7.07		
6	7.5	65.7	12.02	7.09		
7	7.4	66.0	11.96	7.08		
8	7.2	70.3	11.82	7.07		
9	7.1	82.6	12.08	7.03		
10	7.0	89.4	12.21	7.02		
11	6.9	98.2	12.22	7.02		
12	6.9	104.5	12.19	7.01		
13	6.9	108.1	12.22	7.01		
14	6.9	110.1	12.31	7.04		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake.
Sample ID: BBD-64
Crew: MF, JT, MD.
Date/ Time: Aug 12, 2019 17:07
Weather:
Observations:

UTM Coordinates: Easting: 14W0643975 Northing: 7135329 Waypoint: 055
Total Water Depth: 9.6 Secchi Depth: 4.0m
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	7.5	64.5	12.07	7.04		
1	7.5	65.2	12.05	7.04		
2	7.5	65.9	11.98	7.03		
3	7.5	65.6	12.00	7.03		
4	7.5	64.7	12.05	7.05		
5	7.5	64.6	12.01	7.06		
6	7.5	64.2	12.00	7.07		
7	7.4	65.2	11.96	7.09		
8	7.6	78.5	11.94	7.07		
9	7.0	98.7	12.1	7.05		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes? —

Water Sampling and Limnology

AREA INFORMATION

Area: WAL
Sample ID: WAL-96 NA.
Crew:
Date/ Time:
Weather:
Observations:

UTM Coordinates: Easting: Northing: Waypoint:

Total Water Depth: Secchi Depth:

Phytoplankton collected? (Circle one): Yes No Volume Filtered:

Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0						
1						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Attempted sampling on Aug 11, but too windy. Plus we had to disconnect the anchor at WAL-95 because it was lodged in the rocks.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake - East Basin
Sample ID: TPE-126
Crew: E. Franz L. Archambault
Date/ Time: 13 Aug 2019 16:45
Weather: Overcast, 15°C wind SE at < 10 Km/hr
Observations: ~75 m from the BG Dike

UTM Coordinates: Easting: 14W 639088 Northing: 7212521 Waypoint: 011 76CX

Total Water Depth: 7.3 m Secchi Depth: to bottom

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: –

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	11.6	31.2	10.50	7.44		
1	11.6	31.2	10.36	7.45		
2	11.6	31.2	10.34	7.45		
3	11.6	31.1	10.41	7.45		
4	11.5	31.1	10.47	7.45		
5	11.5	31.1	10.34	7.45		
6	11.4	31.1	10.40	7.45		
7	11.4	31.4	10.56	7.44		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes? –

Water Sampling and Limnology

AREA INFORMATION

Area: A20
Sample ID: A20-37
Crew: MF + DE
Date/ Time: AUG 16
Weather: WINDS S 10km.
Observations:

UTM Coordinates: Easting: 14W0604657 Northing: 7252410 Waypoint: 011
Total Water Depth: 5.9m Secchi Depth: Bottom
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL
Field DUP collected? (Circle one): Yes No Photo #s: —

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.6	13.8	10.6	7.0		
1	12.6	13.8	10.6	7.0		
2	12.6	13.0	10.5	7.0		
3	12.5	13.0	10.6	7.0		
4	12.3	12.9	10.59	7.0		
5	12.3	12.9	10.58	6.9		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: SC seems low? readings confirmed in field but may need to double check ~~conductivity~~ calibration

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-115
Crew: E. Franz, M. DiMauro
Date/ Time: Aug 15, 2019 14:35
Weather: Sun, light wind
Observations:

UTM Coordinates: Easting: 14W 622366 Northing: 7216336 Waypoint: 033

Total Water Depth: 53m Secchi Depth: to bottom

Phytoplankton collected? (Circle one): (Yes) No Volume Filtered: 500 mL

Field DUP collected? (Circle one): Yes (No) Photo #s: NA

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	12.7	16.0	9.72	7.01		
1	12.4	15.7	10.04	7.08		
2	12.2	15.6	10.14	7.09		
3	12.2	15.6	10.17	7.09		
4	12.1	15.6	10.00	7.07		
5	12.1	15.6	9.89	7.07		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Arsenic Speciation

Equipment Blank Collection Notes? NA

Water Sampling and Limnology

AREA INFORMATION

Area: WTS

Sample ID: WTS1-97

Crew: MP + JE

Date/ Time: AUG 18 16:07

Weather/Observations: wind NE - 15 km

UTM Coordinates: Easting: 14W06 07696 Waypoint: 034

Northing: 72,4008

Photo #s:

Field DUP collected? (Circle one): Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity	
units:	°C	µS/cm	mg/L		NTU	
0	13.1	80.2	10.42	7.2		
1	13.1	80.2	10.41	7.2		
2	13.1	80.2	10.32	7.2		
3	13.0	80.2	10.22	7.2		
4	13.0	80.2	10.09	7.1		
5	12.9	80.1	9.96	7.1		
6	12.5	80.1	9.85	7.1		
7	12.5	80.5	9.72	7.1		
8	12.5	80.4	9.57	7.1		
9	12.0	81.0	9.58	7.1		
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BOTTLE CHECKLIST

ALS - send Express	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
ALS - send Ground	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 125 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **3 drops** of **Lugol's** back at the lab)

Total Water Depth: 9.6

Secchi Depth: –

Phytoplankton collected? (Circle one): (Yes) No

Volume Filtered: 500 mL

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: DS1
Sample ID: DS1 - 35
Crew: MF - JE
Date/ Time: AUG 17, 2019 14 25
Weather:
Observations:

UTM Coordinates: Easting: 14W 0597622 Northing: 7261052 Waypoint: 227
Total Water Depth: 11.4 Secchi Depth: 4.6
Phytoplankton collected? (Circle one): Yes No Volume Filtered: 500 mL ?
Field DUP collected? (Circle one): Yes No Photo #s:

FIELD MEASUREMENTS

Depth	Temperature	Specific Conductivity	Dissolved Oxygen	pH	Turbidity
units:	°C	µS/cm	mg/L		NTU
0	13.3	14.7	10.6	6.9	
1	13.3	14.8	10.6	6.9	
2	13.3	14.8	10.6	6.8	
3	13.2	14.8	10.6	6.8	
4	13.2	14.8	10.57	6.8	
5	13.2	14.9	10.57	6.8	
6	13.2	15.0	10.55	6.8	
7	13.2	15.1	10.3	6.7	
8	12.9 12.2	17.0	10.60	6.7	
9	12.3	17.2	10.52	6.8	
10	12.1	17.4	10.53	6.8	
11	12.1	17.6	10.56	6.8	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: arsenic speciation
Confirm which DS1 sample was filtered 250mL for chl-a

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: A20 Sample ID: A20-4

Crew: IA, IL, FL Date: 2019-09-12 Time: 14:30

Weather: windy and clear / waves

Observations:

UTM Coordinates: Easting: 0604520 Northing: 7252584 Waypoint:

Total Water Depth: >15 Secchi Depth: 4.5 m

Phytoplankton collected?: (Yes) No Volume Filtered: 500mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.20	6.75	16.2	12.49	0	
1	6.2	6.74	16.1	12.51	0	
2	6.18	6.73	16.1	12.5	0	
3	6.18	6.72	16.2	12.5	0	
4	6.18	6.72	16.2	12.5	0	
5	6.19	6.72	16.1	12.49	0	
6	6.19	6.72	16.2	12.5	0	
7	6.18	6.72	16.2	12.5	0	
8	6.21	6.71	16.2	12.5	0	
9	6.20	6.71	16.2	12.52	0	
10	6.22	6.71	16.2	12.52	0	
11	6.21	6.72	16.2	12.52	0	
12	6.21	6.71	16.3	12.53	0	
13	6.21	6.71	16.3	12.53	0	
14	6.21	6.71	16.2	12.53	0	
15	6.20	6.72	16.2	12.54	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level):	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: ~~Sa~~ Moved away from CREMP coordinates that were given for new coordinate where CREMP was done above.

Equipment Blank Collection Notes? Probe is drifting a bit

Water Sampling and Limnology

AREA INFORMATION

Area: Lake AZO
Sample ID: A20-39
Crew: FL, JA, JL
Date: 2019-09-12
Time: 15:30
Weather: windy, dry (waves)
Observations:
UTM Coordinates: Easting: 605263 Northing: 7252781 Waypoint:
Total Water Depth: 5.94
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.22	6.79	17.2	12.66	0	
1	6.24	6.72	17.2	12.65	0	
2	6.26	6.72	17.2	12.65	0	
3	6.28	6.72	17.2	12.65	0	
4	6.26	6.71	17.1	12.64	0	
5	6.23	6.70	17.2	12.64	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level):	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:
- Arsenic
- We moved from initial point → Not deep enough.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WTS
Sample ID: WTS-46
Crew: JA, FL, JL
Date: 2019-09-12
Time: 16:00
Weather: sunny, windy
Observations:
UTM Coordinates: Easting: 607263
Northing: 7253518
Waypoint:
Total Water Depth: 6.90
Secchi Depth: 4.5m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.37	6.75	84.8	12.02	2.40	
1	6.36	6.80	84.8	12.09	2.24	
2	6.36	6.82	84.8	12.13	2.51	
3	6.37	6.84	84.8	12.13	2.19	
4	6.37	6.87	84.7	12.13	2.27	
5	6.38	6.89	84.8	12.13	2.33	
6	6.38	6.90	84.8	12.13	2.17	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level):	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WTS
Sample ID: WTS-45
Crew: JA, JL, EL
Date: 2019-09-12
Time: 16:20
Weather: windy, sunny, dry
Observations:
UTM Coordinates: Easting: 607571
Northing: 7254136
Waypoint:
Total Water Depth: 7.20
Secchi Depth: 3.5 m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500mL
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	16.52	7.02	84.8	12.06	2.19	
1	16.55	7.03	84.8	12.11	2.63	
2	16.53	7.02	84.9	12.15	2.09	
3	16.52	7.02	84.7	12.16	2.25	
4	16.53	7.03	84.8	12.15	2.35	
5	16.53	7.02	84.9	12.14	2.36	
6	16.53	7.03	84.8	12.14	2.14	
7	16.53	7.02	84.9	12.15	2.12	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with NO HEADSPACE.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)	

Field Notes: As. done here

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake Sample ID: MAM-46

Crew: FL, JL, JA Date: 2019-09-11 Time: 15:10

Weather: partly cloudy, dry, no wind

Observations:

UTM Coordinates: Easting: 604399 Northing: 7254398 Waypoint: 8

Total Water Depth: 8.10 Secchi Depth: 5.5m

Phytoplankton collected?: (Yes) No Volume Filtered: 500mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.55	7.32	113.2	12.62	0.22	
1	5.64	7.22	113.0	12.83	0.19	
2	5.62	7.31	113.2	12.92	0.25	
3	5.62	7.31	113.2	12.99	0.11	
4	5.610	7.31	113.2	13.04	0.18	
5	5.55	7.31	113.2	13.05	0.14	
6	5.52	7.31	114.0	13.07	0.29	
7	5.50	7.30	116.1	13.08	0.32	
8	5.50	7.30	114.3	13.10	0.33	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of Lugol's back at the lab)	

Field Notes: Arsenic collected

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Mammoth Lake
Sample ID: MAM-45
Crew: FL, JL, JA
Date: 2019-09-11
Time: 14:45
Weather: partly cloudy, no wind
Observations:
UTM Coordinates: Easting: 605355 Northing: 7255089 Waypoint:
Total Water Depth: 9.68
Secchi Depth: 4.0m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500mL
Field DUP collected?: (Yes) No
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	~~Sal~~
units:	°C		µS/cm	mg/L	NTU	
0	5.62	7.32	154.2	13.83	0.95	
1	5.59	7.32	154.2	12.95	0.74	
2	5.56	7.32	154.1	13.00	0.82	
3	5.53	7.32	154.1	13.03	0.88	
4	5.52	7.33	154.2	13.04	1.29	
5	5.51	7.33	154.1	13.05	0.92	
6	5.51	7.33	154.1	13.05	0.75	
7	5.51	7.33	154.1	12.06	0.75	
8	5.45	7.34	154.0	13.07	0.60	
9	5.44	7.34	154	13.07	1.56	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:
- Did MD #3 Arsenic collected
- ID: Sept-DUP-3
- We moved from initial point → Not Deep enough

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Nemo
Sample ID: Nemo-46
Crew: JL, FL
Date: 2019-09-13
Time: 15:30
Weather: sunny, dry, no wind
Observations:
UTM Coordinates: Easting: 606152
Northing: 7257527
Waypoint:
Total Water Depth: 13.17
Secchi Depth: 8.0m
Phytoplankton collected?: Yes No
Volume Filtered: 500mL
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.32	7.20	87.0	12.34	0.22	
1	6.91	7.20	87.0	12.41	0.20	
2	6.76	7.19	87.1	12.46	0.05	
3	6.73	7.18	87.2	12.46	0.11	
4	6.71	7.18	86.9	12.46	0.03	
5	6.71	7.17	87.2	12.47	0.05	
6	6.71	7.16	87.1	12.48	0.05	
7	6.72	7.16	86.8	12.48	0.03	
8	6.77	7.16	86.7	12.49	0.14	
9	6.60	7.15	87.1	12.50	0.08	
10	6.59	7.15	87.2	12.49	0.07	
11	6.58	7.15	87.1	12.47	0.00	
12	6.57	7.15	86.8	12.46	0.00	
13	6.57	7.11	86.7	12.45	0.08	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Nemo
Sample ID: Nemo-45
Crew: L. EL
Date: 2019-09-13
Time: 15:00
Weather: sunny, warm, no wind CALM
Observations:
UTM Coordinates: Easting: 606671 Northing: 7257916 Waypoint:
Total Water Depth: 16.60m
Secchi Depth: 8.0m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml
Field DUP collected?: (Yes) No
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity
units:	°C		µS/cm	mg/L	NTU
0	7.15	7.54	88	11.98	0.44
1	6.94	7.51	88.4	12.27	0.35
2	6.79	7.48	88.4	12.36	0.20
3	6.74	7.46	88.4	12.41	0.16
4	6.70	7.45	88.40	12.43	0.20
5	6.68	7.43	88.50	12.44	0.14
6	6.68	7.42	88.40	12.44	0.19
7	6.65	7.41	88.60	12.45	0.15
8	6.64	7.39	88.9	12.46	0.33
9	6.63	7.38	89.0	12.46	0.23
10	6.63	7.37	89.0	12.47	0.24
11	6.63	7.36	89.0	12.47	0.17
12	6.62	7.35	89.0	12.46	0.21
13	6.62	7.34	88.9	12.46	0.18
14	6.63	7.33	88.9	12.44	0.08
15	6.62	7.33	88.9	12.44	0.15
16	6.59	7.32	89.3	12.45	0.25
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with NO HEADSPACE.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton R-Us	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes: SEPT-DUP 4-

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76 Sample ID: A76-40

Crew: ST MA Date: 2019-09-08 Time: 15:40

Weather: Sunny

Observations:

UTM Coordinates: 14W Easting: 601716 Northing: 7256892 Waypoint: A76-40

Total Water Depth: 17.50 m Secchi Depth:

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.88	6.97	46.5	12.23	0	
1	5.87	6.96	46.5	12.22	0	
2	5.86	6.95	46.5	12.22	0	
3	5.86	6.94	46.5	12.21	0	
4	5.85	6.94	46.5	12.22	0	
5	5.85	6.95	46.5	12.22	0	
6	5.85	6.95	46.5	12.23	0	
7	5.85	6.94	46.5	12.22	0	
8	5.85	6.95	46.5	12.22	0	
9	5.85	6.95	46.5	12.22	0	
10	5.84	6.95	46.5	12.22	0	
11	5.84	6.95	46.6	12.22	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level)	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake A76 Sample ID: A76-39
Crew: ST MA Date: 2019-09-08 Time: 15:00
Weather: Sunny
Observations:
UTM Coordinates: 14W Easting: 602920 Northing: 7257014 Waypoint: A76-39
Total Water Depth: 7.23m Secchi Depth: 4.54m
Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml
Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.92	7.06	47.9	12.10	0	
1	5.92	7.05	47.8	12.18	0	
2	5.91	7.04	47.9	12.18	0	
3	5.92	7.03	48.0	12.20	0	
4	5.93	7.02	48.0	12.22	0	
5	5.92	7.02	47.9	12.22	0	
6	5.91	7.01	48.0	12.23	0	
7	5.99	7.02	48.0	12.22	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake DS1 | Sample ID: DS1-38
Crew: ST, MA | Date: 2019-09-07 | Time: 17:00
Weather: Sunny / Cloudy
Observations: WINDY
UTM Coordinates: 14W Easting: 597176 | Northing: 7262183 | Waypoint: DS1-38
Total Water Depth: 19mt | Secchi Depth: 4m
Phytoplankton collected?: (Yes) No | Volume Filtered: 500ml
Field DUP collected?: Yes (No) | Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.94	6.94	23.7	12.03	0.65	
1	6.94	6.94	23.7	11.96	0.66	
2	6.94	6.93	23.7	11.95	0.57	
3	6.94	6.91	23.7	11.96	0.62	
4	6.95	6.93	23.7	11.95	0.59	
5	6.93	6.94	23.8	11.97	0.49	
6	6.93	6.94	23.8	11.93	0.62	
7	6.94	6.94	23.7	11.93	0.56	
8	6.93	6.93	23.7	11.93	0.59	
9	6.93	6.95	23.8	11.93	0.47	
10	6.93	6.93	23.7	11.94	0.57	
11	6.93	6.94	23.8	11.93	0.51	
12	6.92	6.93	23.8	11.94	0.62	
13	6.91	6.94	23.8	11.94	0.55	
14	6.91	6.94	23.8	11.93	0.53	
15	6.91	6.94	23.8	11.93	0.60	
16	6.90	6.94	23.8	11.93	0.57	
17	6.89	6.94	24.2	11.96	0.71	
18	6.80	6.95	24.3	11.95	0.68	
19	6.81	6.95	24.3	11.96	0.69	
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with **NO HEADSPACE**.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)

Field Notes: DION'T REACH BOTTOM OF THE LAKE

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Lake, DS1 Sample ID: DS1-37

Crew: ST MA Date: 2019-09-07 Time: 16:20

Weather: Sunny/Cloudy

Observations: & WINDY

UTM Coordinates: PAW Easting: 597748 Northing: 7258536 Waypoint: DS1-37

Total Water Depth: 12.88 Secchi Depth: 4m

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.12	7.16	22.9	12.87	0.53	
1	5.12	6.97	22.9	12.85	0.57	
2	5.12	6.90	22.9	12.86	0.48	
3	5.10	6.88	22.9	12.86	0.82	
4	5.11	6.87	22.9	12.87	0.43	
5	5.11	6.86	22.9	12.86	0.46	
6	5.10	6.88	22.9	12.87	0.39	
7	5.09	6.85	22.9	12.87	0.44	
8	5.09	6.86	22.9	12.87	0.41	
9	5.09	6.85	22.9	12.87	0.44	
10	5.09	6.85	22.9	12.85	0.38	
11	5.09	6.85	22.9	12.86	0.48	
12	5.10	6.85	22.9	12.86	0.43	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D-8 Sample ID: LKB-15

Crew: ST MA Date: 2019-09-07 Time: 9:45

Weather: SUNNY / CLOUDY

Observations:

UTM Coordinates: Easting: 612510 Northing: 7258689 Waypoint: LKB-15

Total Water Depth: 10.08 m Secchi Depth: 3m

Phytoplankton collected?: (Yes) No Volume Filtered: 500 mL

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.17	7.37	15.2	12.04	0	
1	7.19	7.22	15.2	11.81	0	
2	7.19	7.16	15.2	11.78	0	
3	7.19	7.11	15.2	11.75	0	
4	7.18	7.09	15.2	11.74	0	
5	7.17	7.06	15.2	11.75	0	
6	7.16	7.03	15.2	11.75	0	
7	7.16	7.01	15.2	11.75	0	
8	7.16	6.99	15.2	11.75	0	
9	7.14	6.98	15.2	11.75	0	
10	7.14	6.97	15.2	11.76	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of Lugol's back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D8 Sample ID: LK8-16

Crew: T-ST MA Date: 2019-09-07 Time: 10:18

Weather: SUNNY CLOUDY

Observations:

UTM Coordinates: Easting: 611287 Northing: 7258246 Waypoint: LK8-16

Total Water Depth: 19.34 m Secchi Depth: 3m

Phytoplankton collected?: (Yes) No Volume Filtered: 500 ML

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.44	6.89	15.2	11.65	0	
1	7.44	6.90	15.1	11.65	0	
2	7.44	6.87	15.2	11.64	0	
3	7.44	6.85	15.2	11.64	0	
4	7.44	6.89	15.2	11.64	0	
5	7.44	6.81	15.2	11.63	0	
6	7.44	6.83	15.2	11.64	0	
7	7.42	6.81	15.1	11.64	0	
8	7.42	6.83	15.1	11.65	0	
9	7.41	6.81	15.2	11.65	0	
10	7.40	6.82	15.2	11.65	0	
11	7.40	6.81	15.2	11.65	0	
12	7.40	6.81	15.2	11.64	0	
13	7.40	6.83	15.2	11.64	0	
14	7.39	6.82	15.2	11.65	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LK5 Sample ID: LK5-16

Crew: ST MA Date: 2019-09-09 Time: 9:40

Weather: SUNNY

Observations:

UTM Coordinates: 14W Easting: 612892 Northing: 7252053 Waypoint: LK5-16

Total Water Depth: 19.08m Secchi Depth: 4.5m

Phytoplankton collected?: (Yes) No Volume Filtered: 500ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.06	6.99	27.5	12.09	0.00	
1	5.06	7.02	27.5	12.04	0	
2	5.05	7.00	27.5	12.57	0	
3	5.04	7.01	27.5	12.59	0	
4	5.04	7.02	27.5	12.61	0	
5	5.04	7.02	27.5	12.60	0	
6	5.05	7.03	27.5	12.60	0	
7	5.04	7.03	27.5	12.61	0	
8	5.04	7.04	27.5	12.61	0	
9	5.04	7.04	27.5	12.62	0	
10	5.01	7.05	27.5	12.62	0	
11	5.06	7.06	27.5	12.61	0	
12	5.05	7.05	27.5	12.62	0	
13	5.01	7.06	27.5	12.62	0	
14	~~6.99~~	~~6.99~~	~~36.5~~			
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE DS
Sample ID: LK1 - 15
Crew: ST MA
Date: 2018-09-09
Time: 10:22
Weather: SUNNY
Observations:
UTM Coordinates: 14W
Easting: 612599
Northing: 7252479
Waypoint: LK1-15
Total Water Depth: 12.62m
Secchi Depth: 5m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	4.98	7.02	27.5	12.55	0	
1	4.98	7.04	27.6	12.60	0	
2	4.96	7.01	27.6	12.62	0	
3	4.95	7.01	27.6	12.62	0	
4	4.94	7.02	27.5	12.62	0	
5	4.93	7.02	27.5	12.62	0	
6	4.93	7.01	27.6	12.62	0	
7	4.92	7.02	27.6	12.63	0	
8	4.92	7.02	27.6	12.63	0	
9	4.92	7.03	27.6	12.63	0	
10	4.91	7.05	27.5	12.63	0	
11	4.91	7.04	27.6	12.63	0	
12	4.92	7.04	27.6	12.63	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level):	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D1 Sample ID: LK1-15

Crew: SS JA Date: 2019-09-09 Time: 10:15

Weather: SUNNY

Observations: WINDY

UTM Coordinates: 14W Easting: 607299 Northing: 7295819 Waypoint: LK1-15

Total Water Depth: 11.75m Secchi Depth: 3.75m

Phytoplankton collected?: (Yes) No Volume Filtered: 500ml

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.79	6.72	15.5	12.31	0.56	
1	5.73	6.72	15.4	12.32	0.70	
2	5.73	6.70	15.4	12.32	0.73	
3	5.73	6.69	15.4	12.33	0.50	
4	5.73	6.68	15.4	12.33	0.58	
5	5.72	6.67	15.4	12.34	0.62	
6	5.72	6.67	15.4	12.33	0.68	
7	5.73	6.67	15.4	12.33	0.68	
8	5.73	6.68	15.4	12.33	0.64	
9	5.73	6.66	15.4	12.33	0.58	
10	5.73	6.67	15.4	12.33	0.58	
11	5.73	6.67	15.4	12.33	0.68	
12	~~5.7~~					
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: LAKE D1 Sample ID: LK1-15

Crew: ST JA Date: 2019-09-09 Time: 15:40

Weather: SUNNY

Observations: WINDY

UTM Coordinates: 14W Easting: 608269 Northing: 7297633 Waypoint: LK1-15

Total Water Depth: 9.70m Secchi Depth: 4m

Phytoplankton collected?: (Yes) No Volume Filtered: 500

Field DUP collected?: Yes (No) Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	5.88	6.98	15.5	12.25	0.40	
1	5.88	6.96	15.5	12.26	0.37	
2	5.87	6.91	15.4	12.26	0.47	
3	5.87	6.89	15.5	12.27	0.35	
4	5.86	6.85	15.5	12.27	0.33	
5	5.86	6.83	15.5	12.27	0.37	
6	5.86	6.81	15.5	12.28	0.25	
7	5.85	6.79	15.5	12.29	0.33	
8	5.85	6.76	15.5	12.29	0.47	
9	5.85	6.76	15.5	12.29	0.41	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level)	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake
Sample ID: BAP-66
Crew:
Date: 2019-09-18
Time: 1:45
Weather: cloudy, windy
Observations:
UTM Coordinates: 15W
Easting: 0263626
Northing: 7131222
Waypoint:
Total Water Depth: 9.5m
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.40	7.22	375.6	12.19	103.41	
1	7.39	7.21	375.3	12.19	103.4	
2	7.34	7.21	368.8	12.19	103.3	
3	7.37	7.20	375.5	12.18	103.3	
4	7.33	7.20	377.0	12.20	103.3	
5	7.32	7.20	386	12.18	103.3	
6	7.30	7.19	390	12.19	103.2	
7	7.30	7.19	391	12.19	103.2	
8	7.29	7.19	391.4	12.19	103.2	
9	7.29	7.19	391	12.19	103.2	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Belvedere Lake
Sample ID: RAP 65
Crew: NSAR
Date:
Time: 12:45
Weather: Medium wind / cloudy
Observations: Bi

UTM Coordinates: 15W Easting: 0364105 Northing: 7130677 Waypoint:
Total Water Depth: ~~20m+~~
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.37	7.15	368	12.16	103.1	
1	7.37	7.16	367.5	12.14	103.0	
2	7.37	7.17	367.5	12.16	103.1	
3	7.35	7.12	367.1	12.16	103.2	
4	7.34	7.18	364	12.17	103.2	
5	7.32	7.18	363.8	12.16	103.2	
6	7.35	7.18	363.5	12.17	103.2	
7	7.34	7.18	363	12.17	103.2	
8	7.38	7.18	365	12.18	103.2	
9	7.29	7.18	375.1	12.19	103.2	
10	7.30	7.18	365	12.17	103.2	
11	7.28	7.18	366	12.21	103.2	
12	7.25	7.17	366.9	12.19	103.2	
13	7.22	7.17	365.7	12.20	103.1	
14						
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Big current/waves. Probe wont reach full depth. Broke.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: BBD-65 / Baker Lake
Sample ID: BBD-65
Crew: NS/AB
Date: 2019-09-18
Time: 9:30
Weather: Clear, light fog
Observations:
UTM Coordinates: 19W
Easting: 0644260
Northing: 7135291
Waypoint:
Total Water Depth: 9.95
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

O_2 Zo

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.09	7.02	49.9	12.07	101.6	
1	7.09	7.09	49.4	12.08	101.7	
2	7.09	7.04	48.1	12.08	101.7	
3	7.08	7.03	48.6	12.09	101.6	
4	7.06	7.03	49.3	12.07	101.6	
5	7.09	7.05	49.8	12.09	101.6	
6	7.07	7.04	53.9	12.06	101.6	
7	7.11	7.03	58.7	12.03	101.2	
8	7.32	6.95	139.1	11.97	101.4	
9	7.37	6.99	139.4	11.93	101.1	
10	7.37	7.01	160.5	10.63	50.2	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake (BBD GC Sample ID: BBD GC
Crew: NSI AB Date: 2019-09-18 Time: 10:05
Weather: clear / light wind
Observations:
UTM Coordinates: 14W Easting: 0641731 Northing: 7135230 Waypoint:
Total Water Depth: 9.75m. Secchi Depth:
Phytoplankton collected?: Yes No Volume Filtered:
Field DUP collected?: Yes No Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity (GZ)	
units:	°C		µS/cm	mg/L	NTU	
0	7.39	7.08	74.6	12.01	102.0	
1	7.39	7.08	77.7	12.01	101.9	
2	7.39	7.06	79.1	12.02	101.9	
3	7.39	7.05	85.7	12.03	102.0	
4	7.39	7.06	88.4	12.03	101.9	
5	7.38	7.05	96.6	12.02	101.9	
6	7.38	7.05	94.0	12.02	101.9	
7	7.36	7.04	100.5	12.02	101.8	
8	7.37	7.03	134.5	12.02	101.8	
9	7.36	7.03	135	12.01	101.4	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Baker Lake
Sample ID: BP 5-G6
Crew:
Date:
Time: 11:15
Weather:
Observations:
UTM Coordinates: 15W Easting: 0357320 Northing: 7153874 Waypoint:
Total Water Depth:
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.30	7.30	330	12.13	102.7	
1	7.31	7.31	334.4	12.13	102.7	
2	7.30	7.28	334.1	12.14	102.7	
3	7.31	7.26	332.5	12.14	102.8	
4	7.30	7.25	331.7	12.15	102.9	
5	7.29	7.23	332	12.14	102.8	
6	7.31	7.23	333	12.15	102.9	
7	7.30	7.22	335	12.15	102.9	
8	7.25	7.20	363	12.16	102.9	
9	7.28	7.20	355	12.17	103	
10	7.29	7.21	356	12.19	103.1	
11	7.28	7.20	360	12.20	103.2	
12	7.26	7.20	355	12.19	103.2	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Baker lake
Sample ID: BPJ -65
Crew: NW AB
Date: 2019-09-18
Time: 10:45
Weather: [illegible]
Observations:
UTM Coordinates: 15W
Easting: 0356929
Northing: 7134114
Waypoint:
Total Water Depth: 17.10m
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	7.24	7.22	289.6	12.14	102.6	
1	7.25	7.21	289.8	12.15	102.7	
2	7.24	7.20	289.9	12.16	102.8	
3	7.24	7.20	290.3	12.16	102.8	
4	7.24	7.19	290	12.16	102.8	
5	7.24	7.19	289.9	12.16	102.9	
6	7.25	7.18	288.1	12.16	102.7	
7	7.24	7.18	289.7	12.15	102.7	
8	7.19	7.18	289.6	12.17	102.7	
9	7.20	7.17	290	12.16	102.7	
10	7.21	7.17	290	12.15	102.6	
11	7.13	7.16	305	12.16	102.7	
12	7.16	7.15	300	12.18	102.7	
13	7.10	7.15	310	12.20	102.7	
14	7.10	7.14	326	12.19	102.6	
15	7.11	7.14	336.2	12.17	102.6	
16	7.09	7.12	343	12.15	102.7	
17	7.09	7.07	345		102.7	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: INUQ
Sample ID: INUQ-1/6
Crew: LD - FL
Date: 2019-09-18
Time: 13:20
Weather: Cloudy
Observations:
UTM Coordinates: Easting: 622177
Northing: 7216033
Waypoint:
Total Water Depth: 7.58
Secchi Depth: 6 m
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity
units:	°C		µS/cm	mg/L	NTU
0	6.82	7.37	16.6	12.16	0.23
1	6.82	7.29	16.6	12.19	0.29
2	6.82	7.24	16.6	12.21	0.25
3	6.81	7.21	16.6	12.23	0.16
4	6.81	7.17	16.6	12.25	0.25
5	6.81	7.14	16.6	12.25	0.26
	6.80	7.11	16.6	12.24	0.21
	6.81	7.09	16.6	12.24	0.22
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP
	1 x 500 mL plastic	TSS (low level), TDS (low level)
	1 x 125 mL amber	TOC, total P, NH3, TKN
	1 x 125 mL amber	DOC
	1 x 125 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level)
	2 x 60 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. Fill with NO HEADSPACE.
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and filter 500 mL back at Site. Place filter in 15 mL black tube
Plankton-Bottle	1 x 50 mL glass	Phytoplankton (add 5 drops of Lugol's back at the lab)

Field Notes:

Equipment [illegible]

Water Sampling and Limnology

AREA INFORMATION

Area: INUG
Sample ID: INUG-117
Crew: LD - FL
Date: 2018-09-18
Time: 1420
Weather: Cloudy, windy
Observations:

UTM Coordinates: Easting: 62 26 09
Northing: 7 21 54 51
Waypoint:

Total Water Depth: 7.05
Secchi Depth: 6.5

Phytoplankton collected?: (Yes) No
Volume Filtered: 500

Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.81	7.05	16.5	12.24	0.30	
1	6.81	6.98	16.5	12.25	0.11	
2	6.81	6.91	16.5	12.25	0	
3	6.80	6.88	16.5	12.25	0	
4	6.81	6.88	16.5	12.25	0	
5	6.79	6.87	16.5	12.26	0	
6	6.79	6.84	16.5	12.27	0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Boat engin problem / we took this point instead of the initial INUG-117 coordinates.

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: PDL
Sample ID: PDL-81
Crew: NS. IC
Date: 2019-09-12
Time: 12:50
Weather:
Observations: Sunny, windy.
UTM Coordinates: 14W
Easting: 0630457
Northing: 7223629
Waypoint:
Total Water Depth: 14m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml (chloro)
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen		Turbidity	
units:	°C		µS/cm	mg/L	%	NTU	
0	7.30	7.10	23.2	11.93	100.9		
1	7.28	7.06	23.3	11.97	100.9		
2	7.28	7.05	23.2	11.94	100.9		
3	7.34	7.02	23.2	11.92	100.8		
4	7.40	7.03	23.3	11.90	100.7		
5	7.35	7.02	23.2	11.87	100.6		
6	7.39	7.02	23.2	11.86	100.5		
7	7.34	7.01	23.2	11.83	100.4		
8	7.37	7.02	23.2	11.86	100.4		
9	7.39	7.02	23.1	11.85	100.4		
10	7.40	7.01	23.2	11.86	100.4		
11	7.35	7.04	23.1	11.84	100.4		
12	7.38	7.01	23.1	11.86	100.4		
13	7.34	7.01	23.1	11.85	100.4		
14	~~7.36~~	~~7.01~~	~~23.2~~	~~11.86~~	~~100.4~~		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:
24m from station

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Pipedream lake
Sample ID: PDL-82
Crew: N.S / IC
Date: 2019-09-12
Time: 12:10
Weather: Sunny, windy.
Observations:
UTM Coordinates: 14W
Easting: 0630201
Northing: 7222713
Waypoint:
Total Water Depth: 12m.
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml (chlor)
Field DUP collected?: Yes (No)
Arsenic speciation collected?: (Yes) No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen		Turbidity	
units:	°C		µS/cm	mg/L	%	NTU	
0	7.27	7.10	11.92	11.92	100.8		
1	7.12	7.13	23.3	11.99	100.9		
2	7.12	7.10	23.3	11.99	101.0		
3	7.08	7.10	23.3	12.01	101.0		
4	7.07	7.07	23.3	12.01	101.0		
5	7.11	7.07	23.3	12.01	101.1		
6	7.08	7.06	23.3	12.01	101.1		
7	7.07	7.04	23.3	12.02	101.1		
8	7.09	7.04	23.3	12.01	101.1		
9	7.08	7.02	23.3	12.00	100.9		
10	7.08	7.00	23.3	12.00	100.9		
11	7.09	6.86	24.0	11.88	99.7		
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SP
Sample ID: SP-128
Crew: NS AB
Date: 2019-09-15
Time: 1030
Weather: Rain / wind
Observations:
UTM Coordinates: 14W
Easting: 0640407
Northing: 7213746
Waypoint:
Total Water Depth: 8.41 m
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.96	7.26	39.2	12.31	103.3	
1	6.96	7.27	39.2	12.32	103.3	
2	6.97	7.24	39.2	12.33	103.3	
3	6.97	7.24	39.2	12.32	103.3	
4	6.96	7.23	39.1	12.32	103.3	
5	6.96	7.22	39.1	12.32	103.3	
6	6.96	7.22	39.2	12.33	103.3	
7	6.96	7.21	39.1	12.32	103.3	
8	6.93	7.22	39.1	12.33	103.3	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SP
Sample ID: SP-129
Crew: NS AB
Date: 2019-09-15
Time: 11:00 AM
Weather: windy, moderate rain
Observations:

UTM Coordinates: 4W
Easting: 0640664
Northing: 4213045
Waypoint:
Total Water Depth: 9.68 m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: —
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0	6.86	7.3	39.2	12.36	103.4	
1	6.86	7.29	39.2	12.37	103.5	
2	6.86	7.29	39.2	12.37	103.5	
3	6.86	7.26	39.2	12.37	103.4	
4	6.86	7.24	39.1	12.36	103.4	
5	6.88	7.23	39.0	12.36	103.4	
6	6.88	7.24	39.0	12.35	103.4	
7	6.88	7.23	39.0	12.35	103.4	
8	6.89	7.23	39.1	12.36	103.4	
9	6.89	7.23	39.1	12.35	103.4	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPE
Sample ID: TPE 128
Crew: NS/AB
Date: September 14/19
Time: 11:18
Weather: foggy, light wind
Observations:
UTM Coordinates: 14W
Easting: 0638278
Northing: 7211367
Waypoint: —
Total Water Depth: 6.25
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml (chlor)
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	~~Turbidity~~ 0%	
units:	°C		µS/cm	mg/L	NTU	
0	7.05	7.13	30.0	12.15	102.0	
1	7.07	7.10	30.0	12.13	101.9	
2	6.99	7.08	29.9	12.14	101.9	
3	7.04	7.07	29.8	12.15	101.9	
4	7.00	7.07	29.9	12.14	102.0	
5	7.00	7.08	29.9	12.16	102.0	
6	6.95	7.07	29.8	12.16	102.0	
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BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: TPE
Sample ID: TPE - 129
Crew: NS / AJB
Date: 2019-09-19
Time: 10:04
Weather: Foggy, light wind
Observations:
UTM Coordinates: 14W
Easting: 0639626
Northing: 7211729
Waypoint: ✓
Total Water Depth: 11.70
Secchi Depth:
Phytoplankton collected?: (Yes) No
Volume Filtered: 500 ml - (chlore)
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	~~Turbidity~~ Dissolved %	
units:	°C		µS/cm	mg/L	~~NTU~~ %	
0	6.9	7.22	30.0	12.14	101.7	
1	6.89	7.19	30.1	12.14	101.7	
2	6.91	7.19	30.1	12.14	101.7	
3	6.90	7.18	30.1	12.14	101.6	
4	6.91	7.16	30.1	12.14	101.6	
5	6.88	7.16	30.1	12.14	101.6	
6	6.88	7.15	30.1	12.14	101.6	
7	6.89	7.14	30.1	12.14	101.6	
8	6.83	7.15	30.0	12.16	101.6	
9	6.83	7.13	30.1	12.16	101.6	
10	6.82	7.12	30.1	12.16	101.6	
11	6.82	7.12	30.0	12.15	101.6	
12 (11.70)						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage Lake **Sample ID:** TPN-128
Crew: Isabelle Tétrault, Isabelle Couture **Date:** 2019-09-10 **Time:** 10:00
Weather:
Observations: little windy, partly cloudy
UTM Coordinates: 14W **Easting:** 0635528 **Northing:** 7214208 **Waypoint:**
Total Water Depth: 19m **Secchi Depth:** –
Phytoplankton collected?: Yes (circled) No **Volume Filtered:** 500 ml (chloro)
Field DUP collected?: Yes No (circled) **Arsenic speciation collected?:** Yes No (circled)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen		Turbidity	
units:	°C		µS/cm	mg/L	%	NTU	
0							
1 m		5.80	27.4	12.35	101.1	–	
2		6.00	27.3	12.31	100.9	–	
3		6.14	27.4	12.31	100.9	–	
4		6.36	27.4	12.32	100.9	–	
5		6.53	27.4	12.32	100.9	–	
6		6.67	27.4	12.32	100.9	–	
7		6.88	27.4	12.32	100.9	–	
8		6.98	27.4	12.33	100.9	–	
9		7.65	27.4	12.34	101.1	–	
10		7.65	27.4	12.34	101.1	–	
11		7.65	27.4	12.34	101.1	–	
12		5.74	38.2	8.36	69	–	
13		6.18	38.2	7.11	58.9	–	
14		6.35	38.2	6.94	56.5	–	
15		6.41	38.2	6.78	55.2	–	
16		6.44	38.2	6.49	52.9	–	
17		6.51	38.2	6.34	51.8	–	
18		6.58	38.2	6.19	50.4	–	
19						–	
20						–	

Not working

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Conductivity at surface: 26.7
pH: 6.94
Temperature: 8.5°C

* Trouble with the Eureka *
switched probe after that station.

Equipment Blank Collection Notes?

↑ these readings taking with Oakton pH 50.

Water Sampling and Limnology

AREA INFORMATION

Area: TPM
Sample ID: TPM-129
Crew: NS / AB
Date: Sept. 14/19
Time: 12:09
Weather: fog / light wind
Observations:
UTM Coordinates: 14W
Easting: 0636540
Northing: 7214965
Waypoint:
Total Water Depth: 18m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: 500ml (chlorp)
Field DUP collected?: (Yes) No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

O2 %

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	~~Turbidity~~	
units:	°C		µS/cm	mg/L	NTU	
0	7.41	7.09	27.6	11.88	100.8	
1	7.40	7.05	27.6	11.90	100.9	
2	7.40	7.02	27.6	11.91	101.0	
3	7.40	7.00	27.6	11.91	101.0	
4	7.39	6.99	27.6	11.91	101.0	
5	7.39	7.00	27.6	11.91	100.9	
6	7.39	6.99	27.6	11.90	100.9	
7	7.39	6.98	27.6	11.90	100.9	
8	7.40	6.98	27.6	11.90	100.9	
9	7.40	6.98	27.6	11.90	100.9	
10	7.40	6.99	27.6	11.91	100.9	
11	7.41	6.98	27.6	11.90	100.9	
12	7.40	6.99	27.6	11.90	100.9	
13	7.40	6.99	27.6	11.90	100.9	
14	7.39	6.99	27.6	11.90	100.9	
15	7.40	6.98	27.6	11.90	100.9	
16	7.39	6.99	27.6	11.90	100.9	
17	7.37	6.99	27.6	11.90	100.8	
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes: Sep DUP-1

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WAL
Sample ID: WAL 97
Crew: NSIAB
Date: Sept 14/19
Time: 3:43
Weather: clear, light wind
Observations:
UTM Coordinates: 15W
Easting: 0360443
Northing: 7221214
Waypoint:
Total Water Depth: 5.21m
Secchi Depth: —
Phytoplankton collected?: Yes No
Volume Filtered: 500 ml
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

O2 %

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	~~Turbidity~~	
units:	°C		µS/cm	mg/L	NTU	
0	6.96	7.24	40.0	12.36	103.6	
1	6.96	7.27	39.9	12.58	103.8	
2	6.90	7.27	40.0	12.39	103.8	
3	6.91	7.27	40.0	12.40	103.8	
4	6.81	7.27	39.8	12.42	103.8	
5	6.80	7.26	39.9	12.41	103.8	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WAL
Sample ID: WAL 98
Crew: NSIAB
Date: Sept 14 /19
Time: 4:28
Weather: Clear, light wind
Observations:

UTM Coordinates: 15W
Easting: 0361804
Northing: 7222670
Waypoint:
Total Water Depth: 9.8m
Secchi Depth: —
Phytoplankton collected?: (Yes) No
Volume Filtered: ~~[illegible]~~ 500 ml
Field DUP collected?: Yes (No)
Arsenic speciation collected?: Yes (No)

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C	F	µS/cm	mg/L	NTU	
0	6.79	7.38	39.2	12.38	103.4	
1	6.77	7.36	39.2	12.39	103.4	
2	6.78	7.31	39.2	12.39	103.4	
3	6.77	7.33	39.2	12.39	103.4	
4	6.75	7.31	39.2	12.40	103.4	
5	6.72	7.31	39.2	12.40	103.5	
6	6.72	7.31	39.2	12.41	103.4	
7	6.60	7.31	39.1	12.41	103.4	
8	6.56	7.32	39.2	12.43	103.3	
9	6.54	7.31	39.1	12.44	103.3	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE.**	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops of Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: WTS
Sample ID: November WTS CREMP
Crew: JL - FL - AB
Date: 08/11/2019
Time: 15:00
Weather: Windy, overcast
Observations: Discharging water from WTN

UTM Coordinates: **Easting:** 607646 **Northing:** 7254594 **Waypoint:** NA
Total Water Depth: 6.4 m **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0.5	0.74	6.99	81	14.1		
1	0.82	6.96	79	14.17		
2	0.84	6.95	78.4	14.08		
3	0.84	6.93	78.2	14.05		
4	0.85	6.93	78.8	14		
5	0.84	6.92	80.6	13.97		
6	0.89	6.91	82.5	13.91		
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Third Portage Lake **Sample ID:** TPE Profile
Crew: NS/AB **Date:** 12/11/2019 **Time:** 13:39 PM
Weather: -17C Clear
Observations:

UTM Coordinates: **Easting:** 639029 **Northing:** 7211365 **Waypoint:** NA
Total Water Depth: 16.7m **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0.5	0.29	6.71	32.7	31.88	95	
1	0.4	6.74	31.1	14.3	100.9	
2	0.39	6.75	30.8	14.44	101.8	
3	0.44	6.77	30.4	14.42	101.8	
4	0.46	6.8	30.3	14.4	101.6	
5	0.5	6.8	30.5	14.36	101.5	
6	0.53	6.81	30.6	14.32	101.3	
7	0.56	6.82	30.5	14.27	101	
8	0.6	6.82	30.5	14.22	100.8	
9	0.63	6.82	30.6	14.2	100.7	
10	0.66	6.83	30.8	14.19	100.8	
11	0.69	6.81	30.8	14.17	100.7	
12	0.72	6.81	31	14.12	100.4	
13	0.77	6.82	31	14.06	100.1	
14	0.83	6.8	30.9	13.98	99.5	
15	0.89	6.8	30.7	13.79	98.4	
16	0.98	6.78	31.2	13.68	98	
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Second Portage Lake
Sample ID: SPL Profile
Crew: NS/IT
Date: 10/11/2019
Time: 15:30 PM
Weather: -28c Sunny/wind N 25 kph
Observations:

UTM Coordinates: **Easting:** 639819 **Northing:** 7213985 **Waypoint:** NA
Total Water Depth: 16.7m **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0.5	0.07	6.44	38.9	14.93	104.8	
1	0.7	6.93	38	13.97	99.3	
2	1.12	6.9	39	13.84	96.6	
3	1.19	6.89	38.3	13.67	98.5	
4	1.21	6.88	38.1	13.62	98.2	
5	1.25	6.85	38.9	13.55	97.8	
6	1.19	6.84	39.2	13.42	97.1	
7	1.33	8.82	39.3	13.27	96.2	
8	1.37	6.79	39.4	13.1	94.9	
9	1.44	6.78	39.8	12.79	92.9	
10	1.55	6.75	40.3	12.46	90.8	
11	1.73	6.72	41.7	12.15	88.9	
12	1.85	6.72	42.1	11.92	87.5	
13	1.97	6.72	42.2	11.73	86.5	
14	2.04	6.72	42.8	11.51	85	
15	2.11	6.67	43.4	11.24	83.1	
16	2.16	6.66	45.2	11.01	81.5	
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Third Portage Lake **Sample ID:** TPN Profile
Crew: NS/AB **Date:** 12/11/2019 **Time:** 14:30 PM
Weather: -17C Clear
Observations:

UTM Coordinates: **Easting:** 636156 **Northing:** 7213962 **Waypoint:** NA
Total Water Depth: 24+ m **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0.5	0.29	6.63	37	17.32	121.6	
1	0.61	6.67	29.5	16.23	114.9	
2	0.67	6.74	28	15.12	107.2	
3	0.67	6.74	27.8	14.81	105	
4	0.69	6.72	28.3	14.68	104.2	
5	0.72	6.76	27.8	14.48	102.9	
6	0.9	6.75	27.1	14.7	100.7	
7	1	6.74	27.1	13.85	99.2	
8	1.09	6.76	27.1	13.65	98	
9	1.16	6.76	27.1	13.51	97.2	
10	1.21	6.77	27	13.41	96.6	
11	1.23	6.77	26.9	13.35	96.2	
12	1.24	6.77	26.9	13.32	96.1	
13	1.26	6.75	26.9	13.3	96	
14	1.28	6.75	26.9	13.26	95.7	
15	1.29	6.75	26.9	13.19	95.2	
16	1.29	6.76	26.9	13.17	95.1	
17	1.3	6.75	26.9	13.15	95	
18	1.32	6.74	26.9	13.13	95	
19	1.33	6.74	26.9	13.12	94.8	
20	1.34	6.77	26.9	13.1	94.7	

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Wally
Sample ID: WAL Profile
Crew: NS/AB
Date: 12/11/2019
Time: 13:39 PM
Weather: -17C Clear
Observations:

UTM Coordinates: 15W **Easting:** 361757
Northing: 7222628
Waypoint: NA
Total Water Depth: 9.3
Secchi Depth: NA

Phytoplankton collected?: No
Volume Filtered: NA
Field DUP collected?: No
Arsenic speciation collected?: No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0.5	0.94	6.62	43.4	14.45	89.1	
1	1.11	6.74	43.9	14.34	103.8	
2	1.68	6.73	40.9	14.33	104.7	
3	1.91	6.75	41.6	14.7	103.9	
4	2.05	6.8	42.1	13.9	102.5	
5	2.16	6.82	42.1	13.71	101.2	
6	2.26	6.82	41.7	13.52	100	
7	2.39	6.83	41.1	13.12	97.3	
8	2.49	6.8	41.9	12.45	95	
9	2.6	6.78	42.1	12.38	92.3	
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Mammoth Lake
Sample ID: November Mammoth CREMP
Crew: LD - FL
Date: 13/11/2019
Time: 15:00
Weather: -22 Ice crystals
Observations: Discharging water from WTS

UTM Coordinates: **Easting:** 604084 **Northing:** 7254456 **Waypoint:** NA
Total Water Depth: 14.4 **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	1	6.93	183.1	13.67		
2	1.54	6.81	177.1	13.18		
3	1.68	6.79	179.7	12.95		
4	1.76	6.78	181	12.75		
5	1.8	6.76	181.6	12.5		
6	1.89	6.75	181.5	12.27		
7	1.95	6.74	181.8	12.02		
8	1.99	6.73	181.7	11.91		
9	2.05	6.72	182	11.68		
10	2.11	6.72	181.8	11.44		
11	2.17	6.71	181.7	11.26		
12	2.23	7.05	182.7	11.2		
13	2.29	6.86	182.5	11.26		
14	2.42	6.77	181.4	11.65		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Nemo Lake
Sample ID: November Nemo CREMP
Crew: LD - FL
Date: 17/11/2019
Time: 15:15
Weather: -18 Snowy
Observations:

UTM Coordinates: **Easting:** 606669 **Northing:** 7257708 **Waypoint:** NA
Total Water Depth: 16.58 **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0.5	0.9	7.1	108	15.48		
1	1.15	7.01	105.2	15.6		
2	1.23	7.01	103.3	15.57		
3	1.25	7.02	102.7	15.44		
4	1.29	7.03	102	15.32		
5	1.34	7.04	100.6	15.18		
6	1.4	7.05	99.2	15.01		
7	1.46	7.04	99.1	14.79		
8	1.49	7.04	99.4	14.61		
9	1.53	7.03	99.3	14.49		
10	1.58	7.01	100	14.35		
11	1.63	7	99.8	14.2		
12	1.67	6.98	99.8	14		
13	1.72	6.96	100.1	13.82		
14	1.78	6.93	100.3	13.63		
15	1.83	6.89	100.9	13.31		
16	1.81	6.87	101	13.11		
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes:

Equipment Blank Collection Notes?

AREA INFORMATION

Area: WTS
Sample ID: November WTS CREMP
Crew: JL, FL
Date: 06/12/2019
Time: 10:00
Weather: Sunny, cold, dry, no wind, -30C
Observations: Water discharging from water treatment plant

UTM Coordinates:
Easting: 607648
Northing: 7254502
Waypoint: NA
Total Water Depth: 6.77m
Secchi Depth: NA

Phytoplankton collected?: No
Volume Filtered: NA
Field DUP collected?: No
Arsenic speciation collected?: No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	% DO
units:	°C		µS/cm	mg/L	NTU	
0.5	frozen	frozen	frozen	frozen	frozen	frozen
1	frozen	frozen	frozen	frozen	frozen	frozen
2	0.45	7.12	91.4	14		97.8
3	0.77	7.05	91.4	14.26		99.8
4	0.9	7.04	90.9	14.22		99.7
5	0.92	7.01	98.5	14.09		98.7
6	1.01	7	99.5	13.92		97.8
7	1.16	6.98	99.4	13.74		97
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: St-dd-8 taken nearby
Turbidity sensor is broken

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Mammoth Lake
Sample ID: December Mammoth Profile
Crew: LD - KM
Date: 12/12/2019
Time: 11:50
Weather: -29 Mainly sunny
Observations: Water discharging from WTS lake

UTM Coordinates: **Easting:** 604084 **Northing:** 725456 **Waypoint:** NA
Total Water Depth: 14.61 **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	% DO
units:	°C		µS/cm	mg/L	NTU	
0	frozen	frozen	frozen	frozen	frozen	frozen
1	0.67	6.78	180	13.59		
2	1.28	6.76	194.4	12.67		
3	1.85	6.73	195.8	12.7		
4	1.96	6.72	195.4	11.8		
5	2.1	6.71	195.4	11.25		
6	2.16	6.75	195.3	10.9		
7	2.22	6.74	195.2	10.65		
8	2.29	6.76	195.1	10.31		
9	2.34	6.8	195.2	9.98		
10	2.43	6.83	194.7	9.63		
11	2.48	6.93	194.6	9.11		
12	2.52	7.01	196.4	9.05		
13	2.64	7.11	196.3	9.18		
14	2.79	7.22	195	10		
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: St-dd-8 taken nearby
Turbidity sensor is broken

Equipment Blank Collection Notes?

AREA INFORMATION

Area: Nemo Lake
Sample ID: December Nemo Profile
Crew: LD - KM
Date: 12/12/2019
Time: 14:20
Weather: -29 Mainly sunny
Observations:

UTM Coordinates: **Easting:** 606542 **Northing:** 7257427 **Waypoint:** NA
Total Water Depth: 9.27 **Secchi Depth:** NA

Phytoplankton collected?: No **Volume Filtered:** NA
Field DUP collected?: No **Arsenic speciation collected?:** No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	% DO
units:	°C		µS/cm	mg/L	NTU	
0	frozen	frozen	frozen	frozen	frozen	frozen
1	0.73	7.68	129.4	15.5		
2	1.28	7.7	116.6	15.02		
3	1.38	7.82	114.7	14.82		
4	1.42	7.84	113.3	14.67		
5	1.47	7.88	112.6	14.49		
6	1.53	7.93	111.5	14.34		
7	1.56	7.97	111.4	14.2		
8	1.61	8.02	112.1	14		
9	1.67	8.06	112.8	13.69		
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: St-dd-8 taken nearby
Turbidity sensor is broken

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage East (TPE) **Sample ID:** 2019-12-14 TPE CREMP PROFILE

Crew: NS/AB/DN **Date:** 14/12/2019 **Time:** 11:30

Weather: -25

Observations: Ice thickness: 1 m

UTM Coordinates: 14W **Easting:** 636194 **Northing:** 7214914 **Waypoint:**

Total Water Depth: 12.21m **Secchi Depth:**

Phytoplankton collected?: Yes No **Volume Filtered:**

Field DUP collected?: Yes No **Arsenic speciation collected?:** Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0						
1	0.04	6.2	34.8	17.26	118.3	
2	0.5	6.35	33.7	17.23	119.3	
3	0.65	6.43	33.3	17.33	120.7	
4	0.77	6.55	31.9	16.48	114.8	
5	0.9	6.59	30.5	16.05	111.3	
6	0.96	6.62	30.3	15.6	109.1	
7	1.03	6.63	31.2	15.25	107.4	
8	1.08	6.65	31	15.1	106.3	
9	1.13	6.66	30.7	14.99	105.7	
10	1.16	6.67	31.2	14.81	104.6	
11	1.18	6.68	31.7	14.73	104.1	
12	1.24	6.69	31.7	14.66	103.9	
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: Third Portage North (TPN) **Sample ID:** 2019-12-14 TPN CREMP PROFILE

Crew: NS/AB/DN **Date:** 14/12/2019 **Time:** 10:50

Weather: -22

Observations: Ice Thickness - 1m

UTM Coordinates: 14W **Easting:** 638041 **Northing:** 7210108 **Waypoint:**

Total Water Depth: 24+ m **Secchi Depth:**

Phytoplankton collected?: Yes No **Volume Filtered:**

Field DUP collected?: Yes No **Arsenic speciation collected?:** Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Dissolved Oxygen	
units:	°C		µS/cm	mg/L	%	
0						
1	0.58	6.71	32.9	15.43	107.7	
2	0.74	6.58	30.5	15.79	110.4	
3	0.79	6.63	29.4	15.7	109.8	
4	0.85	6.67	28.4	15.58	109	
5	0.97	6.71	27.5	15.28	106.7	
6	1	6.73	27.4	14.9	104.5	
7	1.07	6.74	27.3	14.6	102.8	
8	1.13	6.75	27.3	14.45	101.9	
9	1.18	6.76	27.4	14.31	101.1	
10	1.24	6.77	27.3	14.2	100.5	
11	1.27	6.78	27.3	14.14	100.1	
12	1.28	6.79	27.3	14.07	99.7	
13	1.3	6.8	27.4	14.02	99.4	
14	1.32	6.81	27.4	13.97	99.1	
15	1.34	6.81	27.4	13.91	98.7	
16	1.36	6.81	27.4	13.83	98.3	
17	1.39	6.82	27.5	13.81	98.2	
18	1.42	6.82	27.5	17.76	97.9	
19	1.44	6.81	27.6	13.68	97.3	
20	1.46	6.8	27.7	13.61	96.9	

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: WAL
Sample ID: 2019-12-14 WAL CREMP PROFILE
Crew: NS/AB/DN
Date: 14/12/2019
Time: 3:05
Weather: -29
Observations: Ice Thickness: 1m
UTM Coordinates: 15W **Easting:** 362431
Northing: 7221417
Waypoint:
Total Water Depth: 5.88m
Secchi Depth:
Phytoplankton collected?: Yes No
Volume Filtered:
Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	1	6.71	41.1	16.87	16.6	
2	1.4	6.61	37.1	16.78	119.5	
3	1.64	6.7	34.7	16.51	118.2	
4	1.68	6.72	35.5	16.02	114.1	
5	1.73	6.73	36.3	15.47	110.8	
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

Water Sampling and Limnology

AREA INFORMATION

Area: SPLE
Sample ID: 2019-12-15 SPLE Profile
Crew: NS/AB
Date: 15/12/2019
Time: 2:00
Weather: -25
Observations:

UTM Coordinates: 14W **Easting:** 639488 **Northing:** 7213898 **Waypoint:**

Total Water Depth: 19.2m
Secchi Depth:

Phytoplankton collected?: Yes No
Volume Filtered:

Field DUP collected?: Yes No
Arsenic speciation collected?: Yes No

FIELD MEASUREMENTS

Depth	Temperature	pH	Specific Conductivity	Dissolved Oxygen	Turbidity	
units:	°C		µS/cm	mg/L	NTU	
0						
1	0.41	6.66	41.9	16.28	112.8	
2	0.85	6.68	40.8	16.2	113.6	
3	1.25	6.7	40.9	16.02	113.3	
4	1.4	6.73	40.2	15.72	111.6	
5	1.47	6.74	39.9	15.39	109.2	
6	1.51	6.76	40.1	15.06	107	
7	1.55	6.77	40.4	14.76	105.1	
8	1.59	6.78	40.6	14.5	103.4	
9	1.63	6.79	40.7	14.06	100.5	
10	1.73	6.79	41.7	13.58	100.3	
11	1.93	6.79	42.7	13.53	97.3	
12	2.18	6.74	43	13.14	95.2	
13	2.35	6.7	44.1	12.35	89.7	
14	2.43	6.66	45.2	11.83	86.1	
15	2.52	6.63	46.3	11.03	80.4	
16	2.62	6.61	47.6	10.5	76.9	
17	2.78	6.57	48.7	9.62	70.6	
18	3	6.53	49.9	8.91	65.8	
19	3.22	6.45	50.6	7.79	58.2	
20						

BOTTLE CHECKLIST

ALS	1 x 500 mL plastic	Alkalinity species, pH, turbidity, EC, conductivity, anions, low level chloride, silicate, ortho-PO4, TDP	
	1 x 500 mL plastic	TSS (low level), TDS (low level)	
	1 x 125 mL amber	TOC, total P, NH3, TKN	
	1 x 125 mL amber	DOC	
	1 x 145 mL plastic	Cyanide: One bottle for total cyanide (low level) and free cyanide (low level).	
	2 x 40 mL glass	Mercury: One vial for total mercury. One bottle for dissolved mercury.	
	2 x 60 mL plastic	Metals: One bottle for total metals. One bottle for dissolved metals.	
	1 x 60 mL brown HDPE	Arsenic speciation: filter sample (bottle precharged with EDTA). Add acetic acid in the field. **Fill with NO HEADSPACE**.	
	1 x 1 L plastic	Chlorophyll-a: Collect 1 L of water and **filter 500 mL** back at Site. Place filter in 15 mL black tube	
Plankton-R-Us	1 x 50 mL glass	Phytoplankton (add **5 drops** of **Lugol's** back at the lab)	

Field Notes: Profile only

Equipment Blank Collection Notes?

APPENDIX I
UPDATES TO TRIGGERS AND THRESHOLDS IN 2019

Report Version

Document	Date
Appendix A – Statistical Analyses for Water Chemistry. In: *Core Receiving Environment Monitoring Program (CREMP): Design Document 2012* -> First iteration of the water chemistry triggers for Meadowbank and Baker Lake study areas	December 2012
Appendix A – Updated Threshold and Trigger Development for CREMP Water Parameters. In *CREMP 2013 Annual Report*. -> Triggers developed specifically for Wally Lake -> Minor updates to the triggers	March 2014
Appendix A – Updated Threshold and Trigger Development for CREMP Water Parameters. In *CREMP 2014 Annual Report*. -> Minor updates to include more recent water chemistry data -> New thresholds added from other jurisdictions for parameters not covered by the CCME freshwater aquatic life guidelines	March 2015
Appendix D – Updated threshold and trigger development for CREMP water parameters. In: *Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update* -> No change from previous version. Re-packed for the updated CREMP Design Document	November 2015
Appendix I – Water Quality Triggers – 2019 Update. In *CREMP 2019 Annual Report* -> New triggers for the Whale Tail Pit study area lakes -> Revised triggers for Meadowbank, Wally, and Baker Lake study areas based on updated thresholds published since 2015.	March 2020

TABLE OF CONTENTS

LIST OF TABLES

I.1 INTRODUCTION

Updates to the water quality triggers and thresholds were completed in 2019, coinciding with the first year of *before-after / control-impact* (BACI) data analysis for the Whale Tail Pit project.

I.2 THRESHOLDS AND TRIGGERS

I.2.1 Data

The data used to develop triggers were the standard control ("baseline") samples – duplicates and depth replicates were excluded as they are pseudo-replicates of standard samples. All baseline samples through September 2019 were used. The number of baseline samples collected for each system was 351 for Meadowbank, 34 for Wally, 64 for Baker, and 306 for WTP. The development of triggers was based on baseline data specific to each system (Meadowbank, Wally, Baker, and WTP). The control/impact status of all CREMP sampling areas since the beginning of monitoring is outlined in **Table I-1.**

I.2.2 Methods

The main text has described the rationale and approach for development of thresholds and triggers. There were three basic methods of trigger development as follows:

1. When a threshold (e.g., CCME guideline) was established, the trigger was set as the maximum of either (a) the value halfway between the baseline median and the threshold (*Method A*), or (b) the 95th percentile of the baseline data (*Method B*).
2. When a threshold was not established, the trigger was set equal to the maximum of either the 95th percentile of the baseline data (*Method B*) or two times the current detection limit (*Method C*).

Medians and 95th percentiles were chosen as metrics rather than means, standard deviations, or maximums, because the former are generally robust to skewed distributions and potential outliers. When required, robust methods were used to estimate medians and 95th percentiles to account for values below detection limits (i.e., censored data; Helsel 2012). The analytical procedures for a given variable were as follows. First, all data reported detection limits greater than the maximum observed value were removed (such values contain no information regarding summary statistics of the data distribution; Helsel 2012). Next, classical estimates of medians

and 95th percentiles were computed if possible (i.e., when there was the required number of observations exceeding detection limits). When there was insufficient data to compute a classical estimate, the median and/or 95th percentile were estimated using the robust "Regression on Order Statistics" (ROS) method as recommended by Helsel (2012) and implemented in the function "cenros" in the R package NADA. However, Helsel (2012) suggests that estimates of summary statistics such as the median are typically unreliable when more than 80% of the observations are censored (below detection limits). Thus, ROS estimates were only used when at least 20% of the observations were above detection limits. When a threshold was established but there was no viable estimate of the median, the current detection limit was used in *Method A* above. When a threshold was not established and there was no viable estimate of the 95th percentile, *Method C* was used.

There were special considerations for several variables, specifically t-Al, t-Cd, t-Mn, t-Zn, d-Al, ammonia-N, t-P, pH and TSS. These cases are explained in detail below.

I.2.3 Results

Thresholds for the 2019 trigger update are summarized in **Table I-2**. For comparative purposes, the previous threshold values from the 2014 update are included in the table, along with updated references for those parameters with threshold values that have changed. In most cases, the threshold was equal to a given guideline, but there were exceptions for a few variables as discussed below. Note that in cases where a water quality guideline exists but Method B was used for trigger development (i.e., cases where baseline data already exceed the guideline for > 5% of cases), it is possible for the trigger to equal or exceed the guideline (e.g., this occurs for total phosphorus, several lower pH triggers, and the Baker triggers for chloride and total/dissolved strontium). In such cases, the guideline is reported as the threshold but is not used as a criterion for action; rather, the trigger is the only criterion for action as is the case for variables lacking water quality guidelines.

There are three variables (t-Cu, t-Pb, t-Ni) for which the water quality guidelines are specific to water hardness ranges below 82, 60, and 60 mg/L $CaCO_3$, respectively. Hardness levels for baseline samples were consistently below 60 mg/L $CaCO_3$ in all four systems. For example, as reported in Table I-3, Table I-6, Table I-12, and **Table I-9** , the 95th percentiles for hardness were 9.5, 16.7, 64.7, and 17.4 mg/L $CaCO_3$ for Meadowbank, Wally, Baker, and WTP samples, respectively. Thus, for these three variables, the guidelines associated with low hardness ranges were used as thresholds.

There were several variables that warranted special consideration in the development of thresholds and/or triggers. These are discussed in the following sections.

I.2.3.1 Ammonia (as N)

The CCME guideline for total ammonia in freshwater is pH and temperature dependent, with more stringent guidelines applying at higher pH and higher temperature. The proposed threshold for Ammonia-N (all systems) was conservatively derived using two discrete CCME guidelines corresponding to specific pH and temperature values. Note that the maximum pH among baseline data for Meadowbank/Wally/Baker/WTP is 8.85, while maximum temperatures in the lakes are around 16 to 18 degrees. The two CCME guidelines that span these maximum (i.e., worst-case) conditions are as follows: (1) total ammonia = 0.239 mg/L for pH = 8.5 and temperature = 15 degrees; and (2) total ammonia = 0.067 mg/L for pH = 9.0 and temperature = 20 degrees. The mid-point of these two values is 0.153 mg/L, which when converted from total ammonia to total ammonia as N is 0.126 mg/L.

Thus, the proposed threshold for ammonia-N is 0.126 mg/L. Application of this threshold provided trigger values of 0.065, 0.067, 0.066, and 0.065 mg/L respectively for Meadowbank (**Table I-3**), Wally (**Table I-6.**), WTP (**Table I-9.**), and Baker Lake (**Table I-12.**). Only at extreme pH and temperature would this trigger potentially exceed the CCME guideline. Whenever the trigger is exceeded, the concentrations of ammonia-N should be compared to the CCME guideline based on the specific pH and field temperature of each sample.

I.2.3.2 Total Phosphorus

The CCME does not specify a particular guideline for total phosphorus, but instead establishes a guidance framework for site-specific application. Under that framework, the specification for ultra-oligotrophic lakes is for total-P of <0.004 mg/L. The framework notes that up to a 50% increase in total-P over baseline is generally considered acceptable. Regardless, the 95th percentiles for Total-P exceeded 0.004 mg/L for Meadowbank, Wally, Baker, and WTP samples (Table I-3, Table I-6, Table I-12, and **Table I-9**). Consequently, the proposed lake-specific triggers were set equal to these 95th percentiles (Method B, Table I-3, Table I-6, **Table I-9**, and Table I-12).

I.2.3.3 pH

The CCME guideline for pH in freshwater is a range from 6.5 to 9.0. Thus, for pH, there is both an upper threshold (9.0) and a lower threshold (6.5), with associated upper and lower triggers (Tables 3A & 3B). In all cases except for laboratory pH at Wally Lake, the lower trigger was based on Method B because the 5th percentiles of the baseline data were close to or less than the lower threshold of 6.5 (Table I-3, Table I-6, **Table I-9**, and Table I-12).

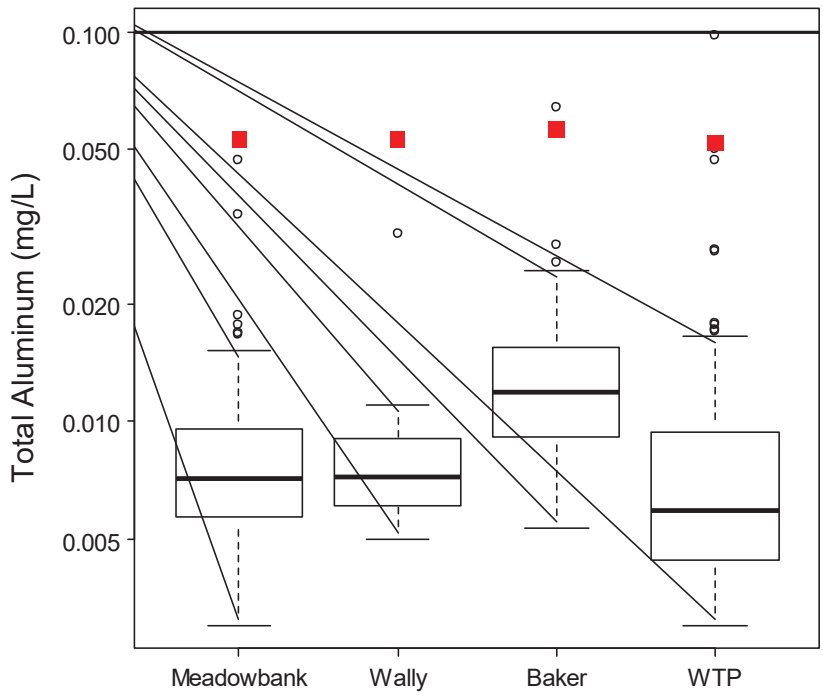
I.2.3.4 Total Suspended Solids

For water bodies with low natural TSS, the CCME guideline is a maximum increase of 25 mg/L over background for short periods (e.g., 24h) and a maximum increase of 5 mg/L over background for longer periods (e.g., 24h to 30 days). If we conservatively assume a background TSS of 0 mg/L, then thresholds of 25 mg/L and 5 mg/L would apply for short-term and long-term exposures, respectively. However, because sampling occurs at most once per month, it will be unknown whether a given TSS measure is a short-term (< 24 h) or longer term (> 24 h) phenomenon. We therefore propose a TSS trigger based on the lower threshold of 5 mg/L, which thereby addresses both short and long durations. The resulting triggers, based on Method A, were 3.0 mg/L for all four systems (Table I-3, Table I-6, **Table I-9**, and Table I-12).

I.2.3.5 Total Aluminum

The CCME guideline for t-Al in water is 0.005 mg/L when pH < 6.5, and 0.1 mg/L when pH ≥ 6.5. Across baseline samples for Meadowbank/Wally/Baker/WTP (n = 648), there were 29 cases of pH < 6.5, and 19 of these occurred during the months of July, August, and September in 2014 (at stations INUG, PDL, TPS, and TEFF). Since September 2014, there was only one baseline sample with pH < 6.5 (pH = 6.41 at station A20 in April 2016, with t-Al = 0.0033 mg/L).

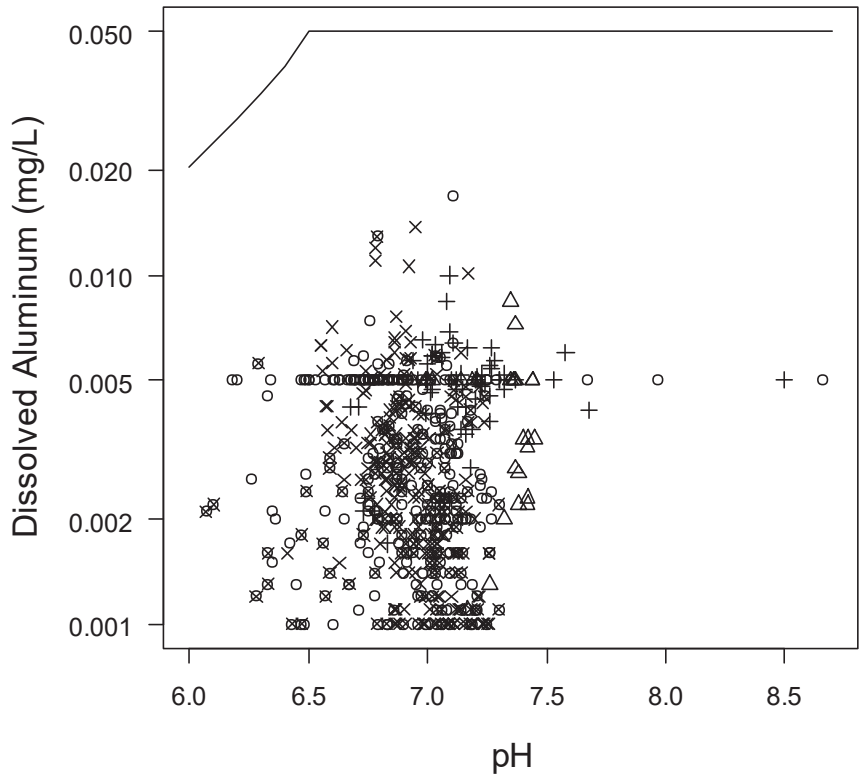
Given the strong tendency for pH to equal or exceed 6.5 across baseline samples, the CCME guideline of 0.1 mg/L was adopted as the threshold for t-Al, and triggers were computed for each system based on Method A (**Table I-4.** [Meadowbank], **Table I-7.** [Wally], **Table I-10.** [WTP], **Table I-13.** [Baker]). For example, across the 351 Meadowbank samples, the median t-Al was 0.006 mg/L and the 95th percentile was 0.013 mg/L (**Table I - 4**). Based on Method A, the value halfway between the median t-Al and the threshold is 0.053 mg/L (i.e., [0.1 – 0.006]/2 = 0.053), which is larger than the 95% percentile (Method B), and thus the proposed trigger for Meadowbank t-Al is 0.053 mg/L. Similar trigger values were computed for Wally, Baker, and WTP. As an example, the following figure shows box-plots of t-Al values (> DL; in log scale) for each system, as well as the guideline (solid line) and proposed triggers (solid red squares).



I.2.3.6 Dissolved Aluminum

There is no CCME guideline for d-Al in water. However, a pH-dependent water quality guideline for d-Al (mg/L) has been developed by BC MOE for protection of freshwater aquatic life. For pH < 6.5, the guideline is as follows: d-Al = $e^{(1.6-3.327*pH + 0.402*K)}$ where K = pH^2. For pH ≥ 6.5, the guideline is 0.05 mg/L. This relationship is illustrated in the figure below (solid curve) across the range of baseline observations of pH for Meadowbank (circles), Wally (triangles), Baker ("+"), and WTP ("x"). The BC MOE guideline greatly exceeds all observed values of d-Al.

Again, we propose a single d-Al trigger for each system. Based on the median lab pH observed for Meadowbank (6.90), Wally (7.35), Baker (7.14), and WTP (6.94), the corresponding BC MOE guideline for d-Al is 0.05 mg/L in each case. The proposed triggers for d-Al (based on Method A and ROS estimates for median d-Al) are 0.026 mg/L for Meadowbank (**Table I-5.**), 0.026 mg/L for Wally (**Table I-8.**), 0.026 mg/L for WTP (**Table I-11.**), and 0.027 mg/L for Baker (**Table I-14.**).

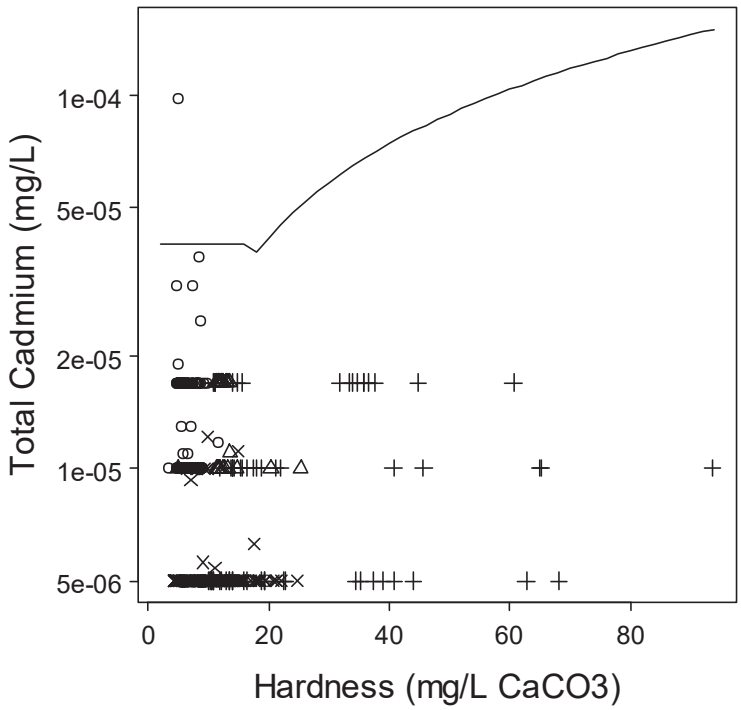


I.2.3.7 Total Cadmium

The hardness-dependent CCME guideline for t-Cd (mg/L) is 0.00004 when water hardness (mg/L $CaCO_3$) is less than 17.0, and equal to 0.001*100.83*log10(H)-2.46 (where H = hardness) when water hardness is ≥ 17.0 and ≤ 280. The relationship is illustrated in the figure below (solid curve) across the range of baseline observations of hardness for Meadowbank (circles), Wally (triangles), Baker ("+"), and WTP ("x"). Note that measurements of t-Cd exceeded detection limits for 20 of 648 baseline samples, and just one measure exceeded the CCME guideline (station TPE, hardness = 5.05, t-Cd = 0.000098 mg/L).

The median sample values of hardness for Meadowbank (6.19), Wally (12.20), and WTP (9.10) were all less than 17.0 mg/L $CaCO_3$, and hence, the CCME guideline of 0.00004 mg/L was set as the threshold for each system. For Baker, median hardness (17.65) was slightly above 17.0 mg/L $CaCO_3$; however, the corresponding guideline (0.000038 mg/L; see equation above) is below the intended lower limit of 0.00004 mg/L due to numerical imprecision (e.g., see the slight reduction in the curve below for hardness values slightly above 17.0 mg/L $CaCO_3$). Thus, the CCME lower limit for t-Cd (0.00004 mg/L) applies to Baker as well. Because there were insufficient data to

compute medians or 95th percentiles for t-Cd, the trigger was computed via Method A using the current detection limit (i.e., halfway between 0.000005 and 0.00004), providing a trigger value of 0.000023 for all four study areas (Meadowbank, Wally Lake, Whale Tail, and Baker Lake).



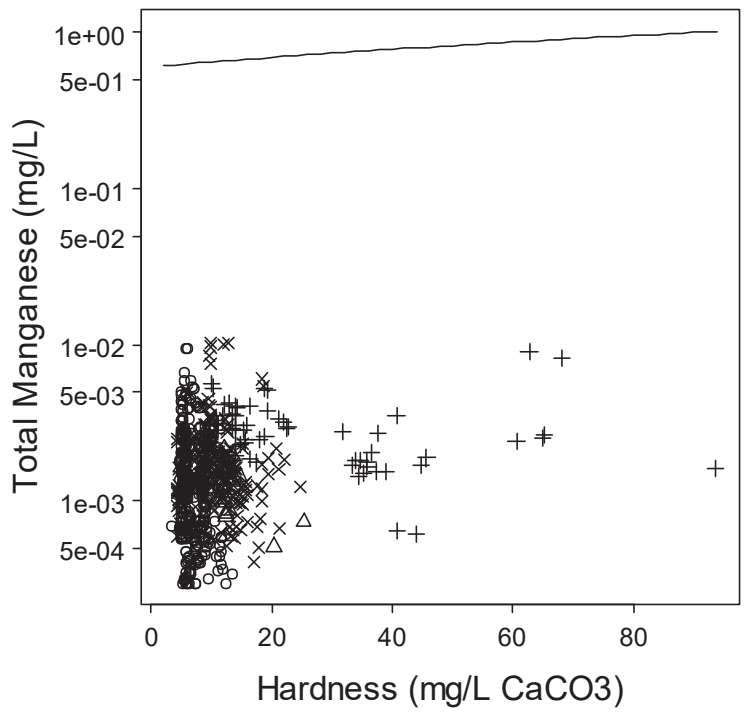
I.2.3.8 Total Manganese[1]

The hardness-dependent BC MOE guideline for t-Mn (mg/L) is 0.0044*H + 0.605, where H = hardness (mg/L $CaCO_3$). This guideline is based on numerous studies for fish, invertebrates and plants. The relationship is illustrated in the figure below (solid curve) across the range of baseline observations of hardness for Meadowbank (circles), Wally (triangles), Baker ("+"), and WTP ("x"). The guideline greatly exceeds observed t-Mn values for all samples.

For simplicity, we propose a single t-Mn trigger for each system. To compute the t-Mn trigger, we first computed the guidelines corresponding to the median values of hardness observed for Meadowbank samples (median hardness = 6.19 mg/L, t-Mn guideline = 0.63 mg/L), Wally

[1] CCME derived short- and long-term freshwater aquatic life water quality guidelines for dissolved manganese in 2019. The update to the triggers were completed prior to the release of the CCME WQGs, so for the current iteration of the CREMP WQG triggers, the threshold for total manganese published by BC MOE was adopted as the threshold for total and dissolve manganese. The dissolved manganese CCME WQG will be incorporated into the next update of the CREMP water quality triggers.

samples (median hardness = 12.2 mg/L $CaCO_3$, t-Mn guideline = 0.66 mg/L), Baker samples (median hardness = 17.65 mg/L $CaCO_3$, t-Mn guideline = 0.68 mg/L), and WTP samples (median hardness = 9.10 mg/L $CaCO_3$, t-Mn guideline = 0.65 mg/L). The corresponding lake-specific triggers for t-Mn (using Method A) are 0.32 mg/L for Meadowbank (**Table I - 4**), 0.33 mg/L for Wally (**Table I-7.**), 0.032 mg/L for WTP (**Table I-10.**) and 0.34 mg/L for Baker (**Table I-13.**).



I.2.3.9 Total Zinc

As discussed below, a long-term freshwater aquatic life WQG was recently developed for dissolved zinc (d-Zn). However, the triggers developed for d-Zn were lower than the current DL for total zinc (t-Zn; 0.003 mg/L) for all systems except Baker. Given this problem, and because d-Zn best represents the bioavailable fraction, we did not develop a trigger for t-Zn for any of the four systems. Instead, monitoring and trigger evaluations for zinc will focus on d-Zn.

I.2.3.10 Dissolved Zinc

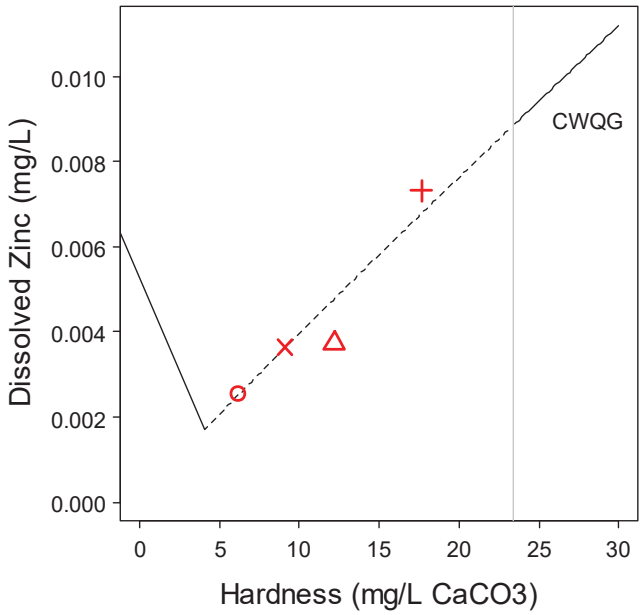
The new 2018 long-term freshwater aquatic life WQG for dissolved zinc (d-Zn; mg/L) is calculated as:

$$\text{Zinc WQG} = 0.001 \times e^{0.947*\ln(H) - 0.815*pH + 0.398*\ln(DOC) + 4.625}$$

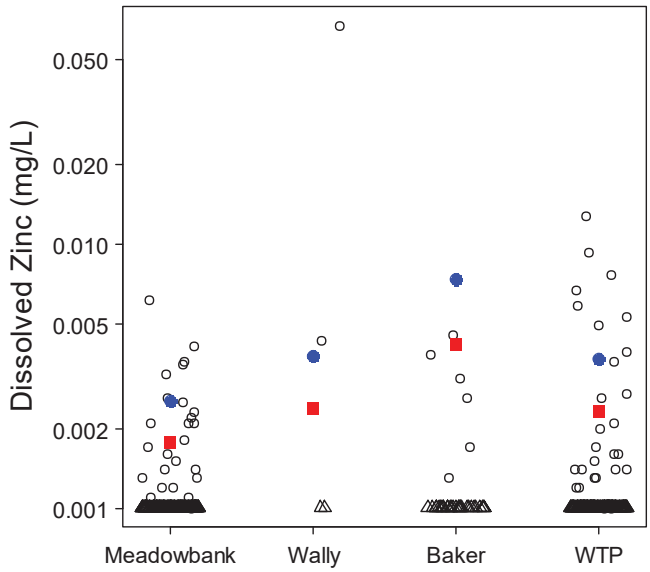
where H = hardness (mg/L $CaCO_3$), pH is in standard units, and DOC = dissolved organic carbon (mg/L). As for t-Mn, we propose a single d-Zn trigger for each system. To compute the d-Zn trigger, we first computed the d-Zn guideline corresponding to the median values of hardness, pH, and DOC observed for baseline samples within each system, as summarized in the table below. Triggers were then computed using Method A with the current DL = 0.001 mg/L for d-Zn (i.e., too few d-Zn values were above detection limits to estimate a median d-Zn value for any system), as reported in the table below and in **Table I-5.** (Meadowbank) **Table I-8.** (Wally) **Table I-11.** (WTP), and **Table I-14.** (Baker).

Metric	Meadowbank	Wally	WTP	Baker
Median hardness (mg/L)	6.19	12.20	9.10	17.65
Median pH (lab)	6.90	7.35	6.94	7.14
Median DOC (mg/L)	1.67	2.20	1.79	3.23
Computed CWQG	0.00254	0.00375	0.00365	0.00732
Current d-Zn DL (mg/L)	0.001	0.001	0.001	0.001
Trigger d-Zn (mg/L) (Method A)	0.0018	0.0024	0.0023	0.0042

It is important to note that these triggers for d-Zn are uncertain and perhaps overly conservative because they occur at hardness levels that are often much lower than the data range used to develop the long-term CWQG for d-Zn (i.e., hardness between 23.4 and 399 mg/L $CaCO_3$; CCME 2018). CCME (2018) states: *Where users want a more stringent WQG for waters below the DOC and hardness limits or above the pH limit, they should extrapolate with caution and contact their local authority for advice*. The following figure depicts the extrapolated CWDG for d-Zn as a function of hardness (with pH set to 7.0 and DOC set to 2 mg/L), and illustrates the extent to which the system-specific median hardness values fall below the lower limit for hardness (23.4 mg/L). In this figure, the solid-line portion of the curve is within the hardness range of data used to derive the CWQC (≥ 23.4 mg/L), the dashed line extrapolates below the lower hardness limit (23.4 mg/L; grey vertical line), and red symbols denote the CWQG computed for each system based on the median values for hardness, pH, and DOC across baseline samples (circle = Meadowbank; triangle = Wally; "+" = Baker; "x" = WTP). It is clear that the median-based CWQGs for d-Zn reported in the table above are largely determined by differences in hardness – when a symbol is off the dashed curve, it is due to slight differences in median pH or DOC values (table above) relative to the specified values (pH = 7.0; DOC = 2.0 mg/L) used to compute the curve.



The next figure shows the baseline measurements of d-Zn for each system that were either above (open circles) or at the current detection limit (0.001 mg/L; open triangles). Data are jittered along the x-axis to aid visualization. The median-based CWQGs (blue solid circles) and triggers (red solid squares) are shown for each system. Across baseline measurements examined for Meadowbank (n=172), Wally (13), Baker (46), and WTP (199), there were few exceedances of the CWQG (6, 2, 0, and 8, respectively) and proposed triggers (13, 2, 1, and 11, respectively).



TABLES

Table I-1. Status of all CREMP sampling areas since the beginning of monitoring.

Area	Meadowbank Areas									Baker Lake Areas				Whale Tail Pit Areas					
Designation	REF	REF	NF	NF	NF	NF	MF	MF	FF	REF	REF	NF	NF	NF	NF	NF	MF	MF	FF
Station	INUG	PDL	TPN	SP	TPE	WAL	TPS	TE	TEFF	BAP	BES	BBD	BPJ	WTS	MAM	NEM	A20	A76	DS1
2006	C		C	C	C	C	C	C											
2007	C		C	C	C	C	C	C											
2008	C		C	I (Aug)	C	C	C	I (Aug)		C		I	I						
2009	C	C	I (Mar)	I	I (Aug)	C	C	I	C	C		I	I						
2010	C	C	I	I	I	C	C	I	C	C		I	I						
2011	C	C	I	I	I	C	C	I	C	C	C	I	I						
2012	C	C	I	I	I	C	C	I	C	C	C	I	I						
2013	C	C	I	I	I	I (Jul)	C	I	C	C	C	I	I						
2014	C	C	I	I	I	I	C	I	C	C	C	I	I	C	C	C			
2015	C	C	I	I	I	I	C	I	C	C	C	I	I	C	C	C			
2016	C	C	I	I	I	I	C	I	C	C	C	I	I	C	C	C	C	C	C
2017	C	C	I	I	I	I	C	I	C	C	C	I	I	C	C	C	C	C	C
2018	C	C	I	I	I	I	C	I	C	C	C	I	I	I (Aug)	I (Nov)	C	C	C	C
2019	C	C	I	I	I	I	C	I	C	C	C	I	I	I	I	I (Aug)	I	I	I

Notes:

Area designations:

C=Control; I=Impact; REF=reference (in grey shading); NF=near-field (in blue shading); MF=mid-field (in pink shading); FF=far-field (in teal shading)

Blank cells indicate the area was not part of the monitoring program that year.

Area IDs:

Meadowbank and Whale Tail Pit Reference areas: INUG = Inuggugayualik Lake; PDL = Pipedream Lake

Meadowbank areas: TPN, TPE, TPS = Third Portage Lake - North, East, South basins; SP = Second Portage Lake; WAL = Wally Lake; TE,TEFF = Tehek Lake (Mid-field and Far-field)

Baker Lake areas: BAP, BES, BBD, BPJ=Baker Lake - Akilahaarjuk Point, East Shore, Barge Dock, Proposed Jetty.

Whale Tail Pit areas: WTS = Whale Tail Lake South Basin; MAM = Mammoth Lake; NEM = Nemo Lake; A20 = Lake A20; A76 = Lake A76; DS1 = Lake DS1

Table I-2. Thresholds for the Core Receiving Environment Monitoring Program.

Analyte	Threshold (2014)				Threshold (2019)				
	Value	Source	Year	Comments	Value	Direction	Source	Year	Comments
Anions & Nutrients (mg/L)									
Ammonia	0.126	CCME	2001	The proposed threshold for Ammonia-N (Meadowbank and Baker) was conservatively derived using two discrete CCME guidelines corresponding to specific pH and temperature values. Note that the maximum pH among baseline data for Meadowbank/Wally/Baker is 8.66, while maximum temperatures in the lakes are around 16 to 18 degrees. The two CCME guidelines that span these maximum (i.e., worst-case) conditions are as follows: (1) total ammonia = 0.239 mg/L for pH = 8.5 and temperature = 15 degrees; and (2) total ammonia = 0.067 mg/L for pH = 9.0 and temperature = 20 degrees. The mid-point of these two values is 0.153 mg/L, which when converted from total ammonia to total ammonia as N is 0.126 mg/L.	0.126	No change	CCME	2001	
pH	6.5-9	CCME	1987	Upper and lower thresholds	6.5-9	No change	CCME	1987	
TSS	5	CCME	1999		5	No change	CCME	1999	
Chloride	120	CCME	2011		120	No change	CCME	2011	
Fluoride	0.120	CCME	2002		0.120	No change	CCME	2002	
Nitrate (as N)	3.0	CCME	2012		3.0	No change	CCME	2012	
Nitrite	0.06	CCME	1987		0.06	No change	CCME	1987	
Total Phosphate (as P)	*<50% above baseline*	CCME	2004	CCME describes using trigger value, if not exceeded then need to assess if >50% increase above baseline or not.	*<50% above baseline*	No change	CCME	2004	
Sulphate (SO_4)	128	BC MOE	2013	From BC MOE, approved WQG, 2013; for very soft water (hardness=0-30 mg/L); 218 mg/L for soft to moderate (hardness=31-75 mg/L); 309 mg/L for moderate to hard (hardness=76-180).	128	No change	BC MOE	2013	
Total Metals (mg/L)									
Aluminum (T)	0.1	CCME	1987	The CCME guideline for t-Al in water is 0.005 mg/L when pH < 6.5, and 0.1 mg/L when pH ≥ 6.5. See text for details.	0.1	No change	CCME	1987	
Antimony (T)	0.020	BC MOE	2017	From BC MOE, working WQ guidelines, BC adopted from Ontario.	0.009	Lower	BC MOE	2017	Working WQG; Reference to ANZECC (2000b); for Sb(III)
Arsenic (T)	0.005	CCME	1997		0.025	Higher	Golder	2019	Site-specific number derived for the Whale Tail Pit Study areas (Addendum Volume 6, Appendix 6-I, Figure 6-I-2)
					0.005	No change	CCME	1997	Applies to Meadowbank, Wally, and Baker Lake study areas.
Barium (T)	1	BC MOE	2017	Working guideline (30-d average aka LT); Working WQG; Reference to Haywood and Drinnin (1983)	1	No change	BC MOE	2017	

Analyte	Threshold (2014)				Threshold (2019)				
	Value	Source	Year	Comments	Value	Direction	Source	Year	Comments
Beryllium (T)	0.0053	BC MOE	2000	Working guideline (short-term guideline)	0.00013	Lower	BC MOE	2000	Working WQG; Reference to ANZECC (2000a); Correction made to threshold (changed from short-term to long-term)
Boron (T)	1.5	CCME	2009		1.5	No change	CCME	2009	
Cadmium (T)	0.00004	CCME	2014	The hardness-dependent CCME guideline for t-Cd (mg/L) is 0.00004 mg/L when hardness > 0 to < 17 mg/L $CaCO_3$ and is 0.001*100.83*log(H)-2.46 where H = hardness (mg/L $CaCO_3$) when hardness is >= 17 to <= 280 mg/L $CaCO_3$. For hardness > 280 mg/L $CaCO_3$, the guideline is 0.00037 mg/L.	0.00004	No change	CCME	2014	
Chromium (T)	0.001	CCME	1997	The CCME guideline for hexavalent chromium (the most common form in surface waters) is 0.001 mg/L.	0.005	Higher	FEQG	2018	FEQG for Cr(VI)
Cobalt (T)	NA				0.00077	Lower	FEQG	2017	Hardness-dependent guideline: WQG=exp{(0.414[ln(hardness)] – 1.887} Value shown for hardness of 50 mg/L
Copper (T)	0.002	CCME	1987	The CCME guideline for t-Cu is 0.002 mg/L for hardness < 82 mg/L CaCO3.	0.002	No change	CCME	1987	*** Draft FEQG is out for public comment (July 2019) BLM
Iron (T)	0.3	CCME	1987	The CCME guideline for t-Fe is 0.3 mg/L.	0.3	No change	CCME	1987	*** Draft FEQG is out for public comment (July 2019) FEQG = 0.604 mg/L
Lead (T)	0.001	CCME	1987	The CCME guideline for t-Pb is 0.001 mg/L for hardness < 60 mg/L $CaCO_3$.	0.001	No change	CCME	1987	*** Draft FEQG is out for public comment (July 2019) FEQG = exp(0.684[ln(DOC)] + 0.924[pH] – 7.323)
Lithium (T)	0.096	BC MOE	2013	From BC MOE, working WQ guidelines, final chronic value, used in Michigan. Updated to 0.44 in 2013.	None	-	None	None	No CCME, BC MOE, or other applicable WQG for lithium; Previous BC MOE Working WQG is no longer listed
Manganese (T)	See text	BC MOE	2001	There is no CCME guideline for t-Mn in water. The hardness-dependent BC MOE guideline for t-Mn in mg/L is 0.0044*H + 0.605, where H = hardness (mg/L $CaCO_3$). See text for details.	See text	No change	BC MOE	2001	
Mercury (T)	0.000026	CCME	2003		0.000026	No change	CCME	2003	
Molybdenum (T)	0.073	CCME	1999		0.073	No change	CCME	1999	
Nickel (T)	0.025	CCME	1987	The CCME guideline for t-Ni is 0.025 mg/L for hardness < 60 mg/L $CaCO_3$.	0.025	No change	CCME	1987	
Selenium (T)	0.001	CCME	1987		0.001	No change	CCME	1987	

Analyte	Threshold (2014)				Threshold (2019)				
	Value	Source	Year	Comments	Value	Direction	Source	Year	Comments
Silver (T)	0.0001	CCME	1987		0.00025	Higher	CCME	2015	
Strontium (T)	0.049	Birge et al. 1979	2018	From the species sensitivity distribution in this De Beers report (Birge et al. 1979);	1.7	Higher	FEQG	2018	
Thallium (T)	0.0008	CCME	1999		0.0008	No change	CCME	1999	
Titanium (T)	2	BC MOE	2013	Working WQGs, median threshold level: *Scenedesmus.*	None	-	None	None	No CCME, BC MOE, or other applicable WQG for titanium; Previous BC MOE Working WQG is no longer listed
Uranium (T)	0.015	CCME	2011		0.015	No change	CCME	2011	
Vanadium (T)	0.006	BC MOE	2013	From BC MOE, working WQ guidelines, BC adopted from Ontario.	0.12	Higher	FEQG	2016	
Zinc (T)	See text	CCME Ekati	2018	The CCME water quality guideline for t-Zn is 0.030 mg/L. However, this guideline does not take into account hardness, and zinc toxicity is known to be hardness-dependent. An assessment for Ekati by EVS (2004) compiled data on species applicable to oligotrophic systems with low hardness, and developed a chronic benchmark for t-Zn that was hardness dependent. See text for details.	Apply the dissolved guideline as recommended by CCME	Variable/lower	CCME	2018	See comment for dissolved zinc below
Dissolved Metals (mg/L)									
Aluminum	0.05	BC MOE	2001	A pH-dependent water quality guideline for d-Al (mg/L) has been developed by BC MOE for protection of freshwater aquatic life when pH <6.5 as follows: d-Al = e(1.6-3.327*pH + 0.402*K) where K = pH2. For pH >= 6.5 the guideline is 0.05 mg/L See text for details.	0.05	No change	BC MOE	2001	Same approach as outlined in the trigger appendix document
Antimony	0.020		See above		0.009	Lower	See above	See above	Same as total
Arsenic	0.005		See above		0.025	Higher	See above	See above	Same as total
Barium	1		See above		1	No change	See above	See above	Same as total
Beryllium	0.0053		See above		0.00013	Lower	See above	See above	Same as total
Boron	1.5		See above		1.5	No change	See above	See above	Same as total
Cadmium	0.00004		See above		0.00004	No change	See above	See above	Same as total
Chromium	0.001		See above		0.005	Higher	See above	See above	Same as total
Cobalt	0.004		See above		0.00077	Lower	See above	See above	Same as total
Copper	0.002		See above		0.002	No change	See above	See above	Same as total
Iron	0.3		See above		0.3	No change	See above	See above	Same as total
Lead	0.001		See above		0.001	No change	See above	See above	Same as total
Lithium	0.096		See above		None	-	See above	See above	No threhsold for dissolved lithium as of 2019

Analyte	Threshold (2014)				Threshold (2019)				
	Value	Source	Year	Comments	Value	Direction	Source	Year	Comments
Manganese	same as Total		See above		See text	No change	See above	See above	** New CCME long-term WQG for dissolved manganese was published in 2019. The existing guideline from BC was carried forward for the 2019 update.
Mercury	0.000026		See above		0.000026	No change	See above	See above	Same as total
Molybdenum	0.073		See above		0.073	No change	See above	See above	Same as total
Nickel	0.025		See above		0.025	No change	See above	See above	Same as total
Selenium	0.001		See above		0.001	No change	See above	See above	Same as total
Silver	0.0001		See above		0.00025	Higher	See above	See above	Same as total
Strontium	0.049		See above		1.7	Higher	See above	See above	Same as total
Thallium	0.0008		See above		0.0008	No change	See above	See above	Same as total
Titanium	2		See above		None	-	See above	See above	No threhsold for dissolved titanium as of 2019
Uranium	0.015		See above		0.015	No change	See above	See above	Same as total
Vanadium	0.006		See above		0.12	Higher	See above	See above	Same as total
Zinc	same as Total		2018		0.004	Lower (0.004 vs 0.011) *** quick comparison assuming hardness of 10 under the old formula	CCME	2018	The long-term CWQG is for dissolved zinc and is calculated using the following equation: CWQG = exp(0.947[ln(hardness mg·L-1)] - 0.815[pH] + 0.398[ln(DOC mg·L-1)] + 4.625). *** WQG of 0.004 mg/L at hardness = 10, pH = 7, and DOC = 2

Table I-3. Meadowbank Water Quality Triggers – Nutrients and Conventional Parameters

Variable	Threshold	DL	Meadowbank Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Ammonia-N	0.126	0.005	351	125	0.004	0.046	0.065	A
TKN	NA	0.05	323	295	0.101	0.172	0.17	B
Nitrate-N	3	0.005	351	48	NA	0.046	1.5	A
Nitrite-N	0.06	0.001	351	10	NA	NA	0.031	A
Ortho-phosphate	NA	0.001	339	24	NA	0.0011	0.002	C
T. phosphorous	0.004	0.002	339	128	0.0015	0.0051	0.0051	B
TOC	NA	0.5	351	351	1.73	2.6	2.6	B
DOC	NA	0.5	351	351	1.67	2.46	2.46	B
Reactive silica	NA	0.5	332	56	0.25	0.44	1	C
Bicarb. alkalinity	NA	1	311	311	5.8	8.7	8.7	B
Chloride	120	0.1	351	288	0.61	0.97	60.3	A
Fluoride	0.12	0.02	323	323	0.055	0.079	0.088	A
Carb. alkalinity	NA	1	339	0	NA	NA	2	C
Conductivity	NA	2	351	351	17.7	27.4	27.4	B
Hardness	NA	0.5	351	351	6.2	9.5	9.5	B
Calcium	NA	0.05	351	351	1.42	2.39	2.39	B
Potassium	NA	0.05	351	226	0.38	0.58	0.58	B
Magnesium	NA	0.005	351	351	0.71	0.93	0.93	B
Sodium	NA	0.05	351	226	0.56	1.16	1.16	B
Sulphate	128	0.3	351	351	1.44	4.83	64.7	A
pH Field (Upper)	9	0.1	321	321	7.12	8.15	8.15	B
pH Field (Lower)	6.5	0.1	321	321	7.12	6.40[a]	6.4	B
pH Lab (Upper)	9	0.1	351	351	6.9	7.25	7.95	A
pH Lab (Lower)	6.5	0.1	351	351	6.9	6.47[a]	6.47	B
Total Alkalinity	NA	1	311	311	5.8	8.7	8.7	B
TDS	NA	3	323	253	12.6	19	19	B
TSS	5	1	351	24	NA	NA	3	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-4. Meadowbank Water Quality Triggers – Total Metals

Variable	Threshold	DL	Meadowbank Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (T)	0.1	0.003	351	283	0.006	0.013	0.053	A
Antimony (T)	0.009	0.0001	350	1	NA	NA	0.0046	A
Arsenic (T)	0.005	0.0001	351	125	0.00013	0.00021	0.00257	A
Barium (T)	1	0.0001	351	226	0.002	0.0033	0.5	A
Beryllium (T)	0.00013	0.0001	351	0	NA	NA	0.000115	A
Boron (T)	1.5	0.01	351	1	NA	NA	0.76	A
Cadmium (T)	0.00004	0.000005	351	13	NA	NA	0.000023	A
Chromium (T)	0.005	0.0001	350	50	0.00006	0.00017	0.0025	A
Copper (T)	0.002	0.0005	351	83	0.00044	0.00064	0.0012	A
Iron (T)	0.3	0.01	351	78	0.0086	0.022	0.15	A
Lead (T)	0.001	0.00005	351	13	NA	NA	0.00053	A
Lithium (T)	NA	0.001	351	10	NA	NA	0.002	C
Manganese (T)	See text	0.0001	351	345	0.0013	0.0042	0.32	A
Mercury (T)	0.000026	0.000005	351	2	NA	NA	0.000016	A
Molybdenum (T)	0.073	0.00005	351	51	0.00003	0.00019	0.037	A
Nickel (T)	0.025	0.0005	351	71	0.0004	0.0008	0.013	A
Selenium (T)	0.001	0.00005	351	2	NA	NA	0.00053	A
Silicon (T)	NA	0.1	232	224	0.15	0.2	0.2	B
Silver (T)	0.00025	0.00001	351	5	NA	NA	0.00013	A
Strontium (T)	1.7	0.0002	339	335	0.0075	0.0108	0.028	A
Thallium (T)	0.0008	0.00001	351	1	NA	NA	0.00041	A
Tin (T)	NA	0.0001	351	3	NA	NA	0.0002	C
Titanium (T)	NA	0.0003	351	19	NA	NA	0.0006	C
Uranium (T)	0.015	0.00001	351	167	0.000039	0.000053	0.0075	A
Vanadium (T)	0.12	0.0005	351	0	NA	NA	0.06	A
Zinc (T)	See text	0.003	351	6	NA	NA	NA	NA

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-5. Meadowbank Water Quality Triggers – Dissolved Metals

Variable	Threshold	DL	Meadowbank Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (D)	0.05	0.001	311	205	0.002	0.005	0.026	A
Antimony (D)	0.009	0.0001	311	0	NA	NA	0.0046	A
Arsenic (D)	0.005	0.0001	311	89	0.00012	0.00018	0.00256	A
Barium (D)	1	0.0001	311	226	0.002	0.0033	0.5	A
Beryllium (D)	0.00013	0.0001	311	0	NA	NA	0.000115	A
Boron (D)	1.5	0.01	311	0	NA	NA	0.76	A
Cadmium (D)	0.00004	0.000005	311	5	NA	NA	0.000023	A
Chromium (D)	0.005	0.0001	310	9	NA	NA	0.00026	A
Copper (D)	0.002	0.0002	311	222	0.00037	0.00052	0.0012	A
Iron (D)	0.3	0.01	311	3	NA	NA	0.16	A
Lead (D)	0.001	0.00005	311	13	NA	NA	0.00053	A
Lithium (D)	NA	0.001	311	2	NA	NA	0.002	C
Manganese (D)	See text	0.0001	311	254	0.0004	0.0028	0.32	A
Mercury (D)	0.000026	0.000005	299	2	NA	NA	0.000016	A
Molybdenum (D)	0.073	0.00005	311	52	0.00005	0.00018	0.037	A
Nickel (D)	0.025	0.0005	311	42	NA	NA	0.013	A
Selenium (D)	0.001	0.00005	311	1	NA	NA	0.00053	A
Silicon (D)	NA	0.05	232	216	0.12	0.18	0.18	B
Silver (D)	0.00025	0.00001	311	0	NA	NA	0.00013	A
Strontium (D)	1.7	0.0002	311	308	0.0075	0.011	0.85	A
Thallium (D)	0.0008	0.00001	311	0	NA	NA	0.00041	A
Tin (D)	NA	0.0001	311	1	NA	NA	0.0002	C
Titanium (D)	NA	0.0003	311	1	NA	NA	0.0006	C
Uranium (D)	0.015	0.00001	310	166	0.00003	0.00004	0.0075	A
Vanadium (D)	0.12	0.0005	311	0	NA	NA	0.06	A
Zinc (D)	See text	0.001	311	25	NA	NA	0.0018	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-6. Wally Lake Water Quality Triggers – Nutrients and Conventional Parameters

Variable	Threshold	DL	Wally Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Ammonia-N	0.126	0.005	34	12	0.007	0.024	0.067	A
TKN	NA	0.05	34	31	0.111	0.163	0.16	B
Nitrate-N	3	0.005	34	2	NA	NA	1.5	A
Nitrite-N	0.06	0.001	34	2	NA	NA	0.031	A
Ortho-phosphate	NA	0.001	34	3	NA	0.001	0.002	C
T. phosphorous	0.004	0.002	34	21	0.0028	0.0067	0.0067	B
TOC	NA	0.5	34	34	2.18	4.11	4.11	B
DOC	NA	0.5	34	34	2.2	3.21	3.21	B
Reactive silica	NA	0.5	32	14	0.74	1.08	1.08	B
Bicarb. alkalinity	NA	1	34	34	10	17.8	17.8	B
Chloride	120	0.1	34	15	0.47	0.64	60.2	A
Fluoride	0.12	0.02	30	30	0.039	0.053	0.08	A
Carb. alkalinity	NA	1	34	0	NA	NA	2	C
Conductivity	NA	2	34	34	28.7	36.6	36.6	B
Hardness	NA	0.5	34	34	12.2	16.7	16.7	B
Calcium	NA	0.05	34	34	3.34	4.88	4.88	B
Potassium	NA	0.05	34	14	0.37	0.59	0.59	B
Magnesium	NA	0.005	34	34	0.96	1.36	1.36	B
Sodium	NA	0.05	34	14	0.48	0.72	0.72	B
Sulphate	128	0.3	34	34	2.34	3.38	65.2	A
pH Field (Upper)	9	0.1	32	32	7.67	8.26	8.34	A
pH Field (Lower)	6.5	0.1	32	32	7.67	6.54[a]	6.54	B
pH Lab (Upper)	9	0.1	34	34	7.35	7.44	8.17	A
pH Lab (Lower)	6.5	0.1	34	34	7.35	7.00[a]	6.92	A
Total Alkalinity	NA	1	34	34	10	17.8	17.8	B
TDS	NA	3	34	34	18	25.3	25.3	B
TSS	5	1	34	1	NA	NA	3	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-7. Wally Lake Water Quality Triggers – Total Metals

Variable	Threshold	DL	Wally Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (T)	0.1	0.003	34	23	0.006	0.011	0.053	A
Antimony (T)	0.009	0.0001	34	0	NA	NA	0.0046	A
Arsenic (T)	0.005	0.0001	34	14	0.00025	0.00029	0.00263	A
Barium (T)	1	0.0001	34	14	0.0019	0.003	0.5	A
Beryllium (T)	0.00013	0.0001	34	0	NA	NA	0.000115	A
Boron (T)	1.5	0.01	34	0	NA	NA	0.76	A
Cadmium (T)	0.00004	0.000005	34	1	NA	NA	0.000023	A
Chromium (T)	0.005	0.0001	34	0	NA	NA	0.0026	A
Copper (T)	0.002	0.0005	34	16	0.00098	0.00129	0.0015	A
Iron (T)	0.3	0.01	34	6	0.015	0.025	0.16	A
Lead (T)	0.001	0.00005	34	2	NA	0.00015	0.00053	A
Lithium (T)	NA	0.001	34	2	0.00085	NA	0.002	C
Manganese (T)	See text	0.0001	34	34	0.0014	0.002	0.33	A
Mercury (T)	0.000026	0.000005	34	0	NA	NA	0.000016	A
Molybdenum (T)	0.073	0.00005	34	3	0.00013	0.00019	0.037	A
Nickel (T)	0.025	0.0005	34	0	NA	NA	0.013	A
Selenium (T)	0.001	0.00005	34	0	NA	NA	0.00053	A
Silicon (T)	NA	0.1	14	14	0.42	0.65	0.65	B
Silver (T)	0.00025	0.00001	34	0	NA	NA	0.00013	A
Strontium (T)	1.7	0.0002	32	32	0.016	0.022	0.033	A
Thallium (T)	0.0008	0.00001	34	0	NA	NA	0.00041	A
Tin (T)	NA	0.0001	34	0	NA	NA	0.0002	C
Titanium (T)	NA	0.0003	34	3	0.00013	0.00049	0.0006	C
Uranium (T)	0.015	0.00001	34	2	0.000044	NA	0.0075	A
Vanadium (T)	0.12	0.0005	34	0	NA	NA	0.06	A
Zinc (T)	See text	0.003	34	2	NA	NA	NA	NA

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-8. Wally Lake Water Quality Triggers – Dissolved Metals

Variable	Threshold	DL	Wally Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (T)	0.05	0.001	27	13	0.003	0.006	0.026	A
Antimony (T)	0.009	0.0001	27	0	NA	NA	0.0046	A
Arsenic (T)	0.005	0.0001	27	13	0.00024	0.00034	0.00262	A
Barium (T)	1	0.0001	27	13	0.0018	0.003	0.5	A
Beryllium (T)	0.00013	0.0001	27	0	NA	NA	0.000115	A
Boron (T)	1.5	0.01	27	0	NA	NA	0.76	A
Cadmium (T)	0.00004	0.000005	27	0	NA	NA	0.000023	A
Chromium (T)	0.005	0.0001	27	0	NA	NA	0.00026	A
Copper (T)	0.002	0.0002	27	15	0.00087	0.00148	0.0015	B
Iron (T)	0.3	0.01	27	0	NA	NA	0.16	A
Lead (T)	0.001	0.00005	27	2	NA	0.00015	0.00053	A
Lithium (T)	NA	0.001	27	2	0.00099	NA	0.002	C
Manganese (T)	See text	0.0001	27	22	0.0004	0.0015	0.33	A
Mercury (T)	0.000026	0.000005	25	0	NA	NA	0.000016	A
Molybdenum (T)	0.073	0.00005	27	8	0.00011	0.00019	0.037	A
Nickel (T)	0.025	0.0005	27	1	NA	NA	0.013	A
Selenium (T)	0.001	0.00005	27	0	NA	NA	0.00053	A
Silicon (T)	NA	0.05	13	13	0.42	0.67	0.67	B
Silver (T)	0.00025	0.00001	27	0	NA	NA	0.00013	A
Strontium (T)	1.7	0.0002	27	27	0.016	0.023	0.86	A
Thallium (T)	0.0008	0.00001	27	0	NA	NA	0.00041	A
Tin (T)	NA	0.0001	27	0	NA	NA	0.0002	C
Titanium (T)	NA	0.0003	27	0	NA	NA	0.0006	C
Uranium (T)	0.015	0.00001	27	2	0.00004	NA	0.0075	A
Vanadium (T)	0.12	0.0005	27	0	NA	NA	0.06	A
Zinc (T)	See text	0.001	27	2	NA	NA	0.0024	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-9. Whale Tail Pit Water Quality Triggers – Nutrients and Conventional Parameters

Variable	Threshold	DL	Whale Tail Pit Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Ammonia-N	0.126	0.005	306	121	0.004	0.022	0.065	A
TKN	NA	0.05	283	281	0.116	0.171	0.17	B
Nitrate-N	3	0.005	306	29	NA	0.007	1.5	A
Nitrite-N	0.06	0.001	306	2	NA	NA	0.031	A
Ortho-phosphate	NA	0.001	306	54	NA	0.0022	0.0022	B
T. phosphorous	0.004	0.002	306	111	0.0013	0.0045	0.0045	B
TOC	NA	0.5	306	306	1.85	2.42	2.42	B
DOC	NA	0.5	306	306	1.79	2.43	2.43	B
Reactive silica	NA	0.5	306	150	0.5	1.33	1.33	B
Bicarb. alkalinity	NA	1	290	290	6.3	9.6	9.6	B
Chloride	120	0.1	306	306	0.9	7.8	60.4	A
Fluoride	0.12	0.02	306	306	0.034	0.067	0.077	A
Carb. alkalinity	NA	1	306	0	NA	NA	2	C
Conductivity	NA	2	306	306	23.5	48.6	48.6	B
Hardness	NA	0.5	306	306	9.1	17.4	17.4	B
Calcium	NA	0.05	306	306	2.24	4.6	4.6	B
Potassium	NA	0.05	306	306	0.45	0.84	0.84	B
Magnesium	NA	0.005	306	306	0.83	1.41	1.41	B
Sodium	NA	0.05	306	306	0.6	1	1	B
Sulphate	128	0.3	306	306	1.7	4.04	64.8	A
pH Field (Upper)	9	0.1	302	302	6.88	7.59	7.94	A
pH Field (Lower)	6.5	0.1	302	302	6.88	6.34	6.34	B
pH Lab (Upper)	9	0.1	306	306	6.94	7.19	7.97	A
pH Lab (Lower)	6.5	0.1	306	306	6.94	6.57	6.57	B
Total Alkalinity	NA	1	290	290	6.25	9.61	9.61	B
TDS	NA	3	290	290	17.3	38.5	38.5	B
TSS	5	1	306	17	NA	1	3	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-10. Whale Tail Pit Water Quality Triggers – Total Metals

Variable	Threshold	DL	Whale Tail Pit Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (T)	0.1	0.003	306	241	0.005	0.015	0.052	A
Antimony (T)	0.009	0.0001	305	4	NA	NA	0.0046	A
Arsenic (T)	0.025	0.0001	306	258	0.00017	0.00041	0.013	A
Barium (T)	1	0.0001	306	306	0.0037	0.0089	0.5	A
Beryllium (T)	0.00013	0.0001	306	0	NA	NA	0.000115	A
Boron (T)	1.5	0.01	306	0	NA	NA	0.76	A
Cadmium (T)	0.00004	0.000005	306	7	NA	NA	0.000023	A
Chromium (T)	0.005	0.0001	303	87	0.00006	0.0002	0.0025	A
Copper (T)	0.002	0.0005	306	38	NA	0.00058	0.0013	A
Iron (T)	0.3	0.01	306	173	0.011	0.037	0.16	A
Lead (T)	0.001	0.00005	302	36	NA	0.00016	0.00053	A
Lithium (T)	NA	0.001	306	28	NA	0.0013	0.002	C
Manganese (T)	See text	0.0001	306	306	0.0015	0.0048	0.32	A
Mercury (T)	0.000026	0.000005	306	2	NA	NA	0.000016	A
Molybdenum (T)	0.073	0.00005	306	43	NA	NA	0.037	A
Nickel (T)	0.025	0.0005	306	181	0.00055	0.00096	0.013	A
Selenium (T)	0.001	0.00005	306	4	NA	NA	0.00053	A
Silicon (T)	NA	0.1	306	306	0.26	0.61	0.61	B
Silver (T)	0.00025	0.00001	306	2	NA	NA	0.00013	A
Strontium (T)	1.7	0.0002	306	306	0.26	0.61	0.61	B
Thallium (T)	0.0008	0.00001	306	2	NA	NA	0.00013	A
Tin (T)	NA	0.0001	306	306	0.01	0.033	0.033	B
Titanium (T)	NA	0.0003	306	1	NA	NA	0.00041	A
Uranium (T)	0.015	0.00001	306	1	NA	NA	0.0002	C
Vanadium (T)	0.12	0.0005	306	9	NA	NA	0.0006	C
Zinc (T)	See text	0.003	306	263	0.000025	0.000048	0.0075	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-11. Whale Tail Pit Water Quality Triggers – Dissolved Metals

Variable	Threshold	DL	Whale Tail Pit Study Areas					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (D)	0.05	0.001	306	276	0.002	0.006	0.026	A
Antimony (D)	0.009	0.0001	303	3	NA	NA	0.005	A
Arsenic (D)	0.025	0.0001	306	216	0.00014	0.00036	0.013	A
Barium (D)	1	0.0001	306	306	0.0037	0.0088	0.5	A
Beryllium (D)	0.00013	0.0001	306	1	NA	NA	0.000115	A
Boron (D)	1.5	0.01	306	0	NA	NA	0.76	A
Cadmium (D)	0.00004	0.000005	300	2	NA	NA	0.000023	A
Chromium (D)	0.005	0.0001	306	20	NA	0.00011	0.0026	A
Copper (D)	0.002	0.0002	305	286	0.00033	0.00054	0.0012	A
Iron (D)	0.3	0.01	306	23	NA	0.013	0.16	A
Lead (D)	0.001	0.00005	300	37	NA	0.00009	0.00053	A
Lithium (D)	NA	0.001	306	28	NA	0.0012	0.002	C
Manganese (D)	See text	0.0001	306	290	0.0005	0.0032	0.32	A
Mercury (D)	0.000026	0.000005	305	4	NA	NA	0.000016	A
Molybdenum (D)	0.073	0.00005	306	29	NA	0.00006	0.037	A
Nickel (D)	0.025	0.0005	306	145	0.00047	0.0009	0.013	A
Selenium (D)	0.001	0.00005	306	3	NA	NA	0.00053	A
Silicon (D)	NA	0.05	306	306	0.23	0.57	0.57	B
Silver (D)	0.00025	0.00001	306	0	NA	NA	0.00013	A
Strontium (D)	1.7	0.0002	306	306	0.01	0.034	0.034	B
Thallium (D)	0.0008	0.00001	306	0	NA	NA	0.00041	A
Tin (D)	NA	0.0001	306	4	NA	NA	0.0002	C
Titanium (D)	NA	0.0003	306	1	NA	NA	0.0006	C
Uranium (D)	0.015	0.00001	305	259	0.00002	0.000041	0.0075	A
Vanadium (D)	0.12	0.0005	306	0	NA	NA	0.06	A
Zinc (D)	See text	0.001	306	42	NA	0.0021	0.0023	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-12. Baker Lake Water Quality Triggers – Nutrients and Conventional Parameters

Variable	Threshold	DL	Baker Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Ammonia-N	0.126	0.005	64	29	0.005	0.056	0.066	A
TKN	NA	0.05	59	55	0.163	0.222	0.22	B
Nitrate-N	3	0.005	64	58	0.018	0.04	1.51	A
Nitrite-N	0.06	0.001	64	3	NA	NA	0.031	A
Ortho-phosphate	NA	0.001	64	9	NA	0.0014	0.002	C
T. phosphorous	0.004	0.002	64	47	0.0035	0.0075	0.0075	B
TOC	NA	0.5	64	64	3.25	4	4	B
DOC	NA	0.5	64	64	3.23	3.89	3.89	B
Reactive silica	NA	0.5	61	12	0.32	0.5	1	C
Bicarb. alkalinity	NA	1	59	59	9.2	10.6	10.6	B
Chloride	120	0.1	64	64	26.2	168.9	168.9	B
Fluoride	0.12	0.02	61	59	0.056	0.073	0.088	A
Carb. alkalinity	NA	1	64	0	NA	NA	2	C
Conductivity	NA	2	64	64	119.5	642.4	642.4	B
Hardness	NA	0.5	64	64	17.7	64.7	64.7	B
Calcium	NA	0.05	64	64	3.04	6.17	6.17	B
Potassium	NA	0.05	64	53	0.95	3.89	3.89	B
Magnesium	NA	0.005	64	64	2.66	12.44	12.44	B
Sodium	NA	0.05	64	64	14.2	88.5	88.5	B
Sulphate	128	0.3	64	64	4.1	24.4	66.1	A
pH Field (Upper)	9	0.1	59	59	7.15	8.15	8.15	B
pH Field (Lower)	6.5	0.1	59	59	7.15	6.55[a]	6.55	B
pH Lab (Upper)	9	0.1	64	64	7.14	7.57	8.07	A
pH Lab (Lower)	6.5	0.1	64	64	7.14	6.75[a]	6.75	B
Total Alkalinity	NA	1	59	59	9.2	10.6	10.6	B
TDS	NA	3	59	59	64.8	245.3	245.3	B
TSS	5	1	64	9	NA	NA	3	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-13. Baker Lake Water Quality Triggers – Total Metals

Variable	Threshold	DL	Baker Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (T)	0.1	0.003	64	63	0.012	0.024	0.056	A
Antimony (T)	0.009	0.0001	64	0	NA	NA	0.0046	A
Arsenic (T)	0.005	0.0001	64	37	0.00013	0.00017	0.0.00257	A
Barium (T)	1	0.0001	64	47	0.018	0.02	0.51	A
Beryllium (T)	0.00013	0.0001	64	0	NA	NA	0.000115	A
Boron (T)	1.5	0.01	64	21	0.007	0.046	0.75	A
Cadmium (T)	0.00004	0.000005	64	0	NA	NA	0.000023	A
Chromium (T)	0.005	0.0001	64	8	0.00004	0.0002	0.0025	A
Copper (T)	0.002	0.0005	64	12	0.00043	0.00054	0.0012	A
Iron (T)	0.3	0.01	64	40	0.017	0.038	0.16	A
Lead (T)	0.001	0.00005	64	3	NA	NA	0.00053	A
Lithium (T)	NA	0.001	64	25	0.001	0.0033	0.003	B
Manganese (T)	See text	0.0001	64	64	0.0027	0.0053	0.34	A
Mercury (T)	0.000026	0.000005	64	0	NA	NA	0.000016	A
Molybdenum (T)	0.073	0.00005	64	28	0.00007	0.00016	0.037	A
Nickel (T)	0.025	0.0005	64	0	NA	NA	0.013	A
Selenium (T)	0.001	0.00005	64	2	NA	NA	0.00053	A
Silicon (T)	NA	0.1	47	47	0.19	0.28	0.28	B
Silver (T)	0.00025	0.00001	64	0	NA	NA	0.00013	A
Strontium (T)	1.7	0.0002	64	64	0.025	0.083	0.083	B
Thallium (T)	0.0008	0.00001	64	0	NA	NA	0.00041	A
Tin (T)	NA	0.0001	64	0	NA	NA	0.0002	C
Titanium (T)	NA	0.0003	64	6	0.00019	0.00039	0.0006	C
Uranium (T)	0.015	0.00001	64	37	0.000048	0.000065	0.0075	A
Vanadium (T)	0.12	0.0005	64	0	NA	NA	0.06	A
Zinc (T)	See text	0.003	64	1	NA	NA	NA	NA

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

Table I-14. Baker Lake Water Quality Triggers – Dissolved Metals

Variable	Threshold	DL	Baker Lake					
			N	>DL	Median	95th %ile	Trigger	Method
Aluminum (D)	0.05	0.001	61	49	0.005	0.006	0.027	A
Antimony (D)	0.009	0.0001	61	0	NA	NA	0.0046	A
Arsenic (D)	0.005	0.0001	61	34	0.00011	0.00014	0.00256	A
Barium (D)	1	0.0001	61	47	0.0178	0.02	0.51	A
Beryllium (D)	0.00013	0.0001	61	0	NA	NA	0.000115	A
Boron (D)	1.5	0.01	61	15	0.007	0.042	0.75	A
Cadmium (D)	0.00004	0.000005	60	0	NA	NA	0.000023	A
Chromium (D)	0.005	0.0001	61	3	NA	0.00013	0.00026	A
Copper (D)	0.002	0.0002	61	45	0.00029	0.00042	0.0011	A
Iron (D)	0.3	0.01	61	4	NA	NA	0.16	A
Lead (D)	0.001	0.00005	61	2	NA	NA	0.00053	A
Lithium (D)	NA	0.001	61	22	0.0011	0.0022	0.0022	B
Manganese (D)	See text	0.0001	61	57	0.0008	0.0036	0.34	A
Mercury (D)	0.000026	0.000005	59	0	NA	NA	0.000016	A
Molybdenum (D)	0.073	0.00005	61	27	0.00006	0.00014	0.037	A
Nickel (D)	0.025	0.0005	61	0	NA	NA	0.013	A
Selenium (D)	0.001	0.00005	61	3	NA	NA	0.00053	A
Silicon (D)	NA	0.05	47	46	0.16	0.25	0.25	B
Silver (D)	0.00025	0.00001	61	0	NA	NA	0.00013	A
Strontium (D)	1.7	0.0002	61	61	0.025	0.078	0.86	B
Thallium (D)	0.0008	0.00001	61	0	NA	NA	0.00041	A
Tin (D)	NA	0.0001	61	0	NA	NA	0.0002	C
Titanium (D)	NA	0.0003	61	0	NA	NA	0.0006	C
Uranium (D)	0.015	0.00001	61	36	0.00004	0.000054	0.0075	A
Vanadium (D)	0.12	0.0005	61	0	NA	NA	0.06	A
Zinc (D)	See text	0.001	61	6	NA	0.003	0.0042	A

Notes: For each variable, thresholds (guidelines) are shown if applicable (see text for discussion); DL = current detection limit; N = sample measurements; >DL = number of measurements above DL; 95th %ile = 95th percentile if estimable; Method = method used to determine the trigger, where A = halfway from median (or DL if median not estimable) to threshold, B = 95th percentile, and C = 2-times the DL, NA = not applicable (thresholds) or not measured (summary statistics)

APPENDIX J
WATER QUALITY EFFECTS ASSESSMENT

TABLE OF CONTENTS

J.1 INTRODUCTION

This technical document was prepared by Azimuth Consulting Group Partnership (Azimuth) to provide context on the potential for adverse effects to lower trophic biota (i.e., phytoplankton, zooplankton and benthic invertebrates) due to changes in water parameters that do not have effects-based thresholds (e.g., water quality standards, guidelines or criteria).

J.1.1 Background

The decision framework for the CREMP incorporates the use of *thresholds* (i.e., typically CCME water quality guidelines or effects-based equivalents from other jurisdictions) and *triggers* (i.e., early warning limits typically set between baseline/reference conditions and the threshold for parameters with effects-based guidelines, or set at the 95th percentile of the baseline/reference conditions; see **Appendix I** for details). To date, for parameters with effects-based thresholds, CREMP monitoring has shown that receiving environment water quality in the Meadowbank and Whale Tail Pit study lakes meets both the trigger and threshold values (i.e., well below water quality guidelines).

Mining-related increases, particularly at NF study areas, have been observed for some parameters without water quality guidelines, including total dissolved solids (TDS), total alkalinity, conductivity, hardness, and certain major ions (i.e., calcium, magnesium, potassium, and sodium). Most of these parameters also exceed predicted concentrations presented in the Meadowbank Final Environment Impact Statement (FEIS) (Cumberland, 2005). In addition, total silicon, which was not routinely measured during the baseline period and shows little in the way of temporal trends, exceeds FEIS predictions. Because silicon was not routinely included in the suite of analyses in the baseline water chemistry samples, the baseline water quality values for Third Portage Lake, Second Portage Lake, and Wally Lake were set to 0 mg/L. This approach resulted in an underestimate of future concentrations for Third Portage Lake, Second Portage Lake, and Wally Lake. Silicon is not recommended as a parameter for evaluating the accuracy of the water quality model predictions for the Meadowbank study area lakes given the underestimate in baseline water chemistry.

As described in the main report, biological monitoring conducted under the CREMP targets the phytoplankton and benthic invertebrate communities. Results to date indicate that communities in the NF areas are functionally intact, with major indices such as taxonomic richness and abundance remaining relatively stable across the more than a decade of events. Thus, the biological data indicate that current water quality in the NF study areas is not adversely affecting

the health of phytoplankton and benthic invertebrate communities compared to baseline or reference conditions.

J.1.2 Rationale

Notwithstanding the evidence showing phytoplankton and benthos communities are similar to baseline/reference conditions, the Kivalliq Inuit Association (KIA), in their review of the 2018 annual report, recommended[1] that Agnico Eagle complete the following:

i. *Investigate the source of these parameter increases, their spatial extent and the reversibility of these trends.*

ii. *Discuss the implications of increased conductivity, calcium, magnesium, potassium, sodium, TDS and alkalinity at the near-field sites on lower trophic levels, specifically in terms of the community composition of phytoplankton, zooplankton and benthic invertebrates.*

iii. *In accordance with AEM Management Response Plan for the Meadowbank Mine Aquatic Environment Monitoring Program, that AEM increase monitoring frequency at the mid-field sites to determine the spatial extent of exceedances observed in the near-field during the open water season.*

iv. *Conduct an investigation of cause study for the observed changes in water chemistry and determine possible management strategies.*

This technical memorandum is meant to address recommendations i) and ii) above by providing a review of available literature on the effects of selected conventional and ionic compounds on lower trophic level community composition. The outcome of this technical review will help determine if increased monitoring frequency (point iii) and/or investigation of cause studies (point iv) should be considered to help inform adaptive management decisions.

J.1.3 Approach

As described in **Section J.1.1**, the following parameters have been shown to be exceeding baseline/reference conditions and/or FEIS predictions: total dissolved solids (TDS), total alkalinity, conductivity, hardness, certain major ions (i.e., calcium, magnesium, potassium, and sodium), and total silicon. Apart from total silicon, the rest of these parameters are inter-related to some extent or are not parameters of toxicological concern. Rationale for the approach used herein to cover the range of parameters is as follows:

[1] Recommendation 22 in the 2018 Annual Report Comments.

- *TDS* – this parameter is a measure of all dissolved constituents in water, but is comprised primarily of inorganic salts (mainly calcium, potassium, magnesium, sodium, bicarbonates, chlorides, and sulphates). Consequently, it essentially includes total alkalinity (the measure of a solution's ability to neutralize acid inputs), hardness (the sum of multivalent ions in solution), conductivity (the measure of a solution's ability to conduct electricity; correlated to dissolved salts), and major ions (concentrations of individual ions in solution). While a site-specific approach that considers the ratios of individual major ions is preferred from a technical perspective, it is not practical for a literature approach due to the sheer number of permutations across these constituents. Consequently, the literature review for the parameters mentioned herein focused on primarily on TDS.
- *Conductivity* – as mentioned above, this parameter is related to TDS and could therefore be excluded for singular focus. However, as there is some effects-based information available (e.g., US EPA 2016), we have included it for additional context.
- *Total silicon* – this parameter plays an important role as an essential dissolved element consumed by the phytoplankton group of algae called diatoms. Relative abundance of this primary producer can have effects on higher trophic level organisms and as community changes occur in response to elevated or reduced silicon.

J.2 LITERATURE REVIEW

A literature review was completed to assess the potential effects of TDS, conductivity and total silicon at different concentrations on fresh water aquatic life (e.g., phytoplankton, zooplankton, benthic invertebrates, and fish species) that may either reasonably be found in the Meadowbank study area lakes or be reasonably comparable. Preference was given to peer-reviewed literature and government sources including articles, studies, effects assessments, published guidance, and literature reviews. Other sources (e.g., unpublished "grey" literature) were also used where relevant.

J.2.1 Total Dissolved Solids

Solids in water can be measured as total solids, total suspended solids (TSS), or total dissolved solids. Total solids is the measure of all both TSS and TDS. TDS is the measure of all dissolved constituents of a solution which may be of anthropogenic origin such as mining activities or road salt-contaminated runoff or natural influences such as soils or geology (Weber-Scannel & Duffy 2007). The measurement of TDS is conducted by the removal of suspended solids by filtration

through a 0.7-micron glass fiber filter followed by drying of the filtrate at 180 degrees Celsius. The dried filtrate residue is divided by the volume of water filtered to determine the concentration of TDS which is usually reported in mg/L (APHA 2017). TDS is comprised mainly of inorganic ions but can also include dissolved organic matter. The potential biological effects of TDS are, therefore, related to the specific composition of the ions, their speciation, and other solids present in water. TDS may also exhibit toxicity through osmotic stress (i.e., where cell desiccation occurs due to leakage Davies & Hall 2007). Except in conditions where ratios and speciation of ionic components are fairly stable, TDS may be a poor predictor of toxicity (Chapman & McPherson 2016).

Similar to conductivity, TDS may be used as a surrogate measure for salinity because this measure tends to provide an estimate of the ionic compounds present (USEPA 1999). While elevated concentrations of TDS may change the osmotic conditions whereby elevated concentrations of TDS leads to potential osmotic stress especially in ultra-oligotrophic lakes with naturally low TDS, the ratios of ions present in solution are important due to the presence of essential macro and micro-minerals (EPA 2002). Meadowbank and Whale Tail study areas feature ultra-oligotrophic lakes with naturally low TDS. Increased chemical density influences the osmotic regulation of metabolism and biotic distribution in aquatic communities (BC MOE 2013).

Due to the complex and variable composition of ions and dissolved solids measured as TDS, a generic TDS guideline for the protection of aquatic life must be overly protective to account for the most toxic potential combination to the most sensitive organisms and life stage (Weber-Scannell and Duffy 2007). Assigning a threshold concentration for TDS is difficult because the high site specificity of this parameter. This challenge is reflected in the absence of any federal water quality guideline, with the exception of an aesthetic objective of less than or equal to 500 mg/L, for TDS (Health Canada 1991). Regulation of TDS is also limited in other jurisdictions with few exceptions such as Alaska, where TDS may not exceed 500 mg/L without a special permit and 1,000 mg/L at any time (ADEC 2012).

The presence of dissolved ions in solution is essential for the survival of aquatic organisms and provides the basis for the lowest trophic residents in the form of mineral uptake. Macro-mineral uptake is required for the support of biochemical functions such as magnesium and potassium (EPA 2002). Another example of the important biological role of dissolved ions is the importance of chloride in osmoregulation (Elphick et al. 2010). Many communities have low sensitivity to TDS these may be more readily detected through biological monitoring which can detect the overall impact of changes of water quality in a system (Buikema et al. 1982). Toxicity is highly

dependent upon both the composition of the residents of the system and the components, speciation, and ratios of the dissolved analytes.

Weber-Scannell and Duffy (2007) reviewed TDS toxicity to aquatic life and recommend deriving ion-specific limits for aquatic life (i.e., rather than for TDS) although this may not satisfy the potential osmotic regulation concerns. Mount et al. (1997) prepared and tested the toxicity of over 2,900 ionic solutions on Daphnids (*Ceriodaphnia dubia* and *Daphnia magna*). Their results suggested the following descending relative ion toxicity: potassium, bicarbonate and magnesium, chloride, sulphate. Neither sodium nor calcium resulted in significant effects (Mount et al., 1997). However, Mount et al. (1997) also found that the potential toxicity of chloride, sulphate, and potassium were reduced in solutions enriched with more than one cation. The inability to identify to attribute the toxicity of a specific constituent of TDS is inherent to the nature of the complex mixture this parameter measures with potential for effect masking, additive toxic effects, and synergistic toxic effects (Goodfellow et al. 2009). Timpano et al. (2010) examined the relationship between benthic macroinvertebrate community metrics in coal field streams and TDS. They caution that impacts from mine-related TDS is confounded because elevated TDS rarely occurs independently of other stressors. This study indicated several benthic macroinvertebrate richness measures were inversely correlated with TDS. Relative species abundance showed no correlation to TDS. Concentrations of TDS in the study streams ranged from 27.8 to 791.6 mg/L. The dominance of sulphate as a constituent in this study may reduce its relevance given the historically low sulphate concentrations in the Meadowbank study area lakes; in addition, the TDS concentrations are also notably higher than those found in the Meadowbank study area lakes.

The TDS review paper by Weber-Scannel and Duffy (2007) showed effects at concentrations less than 250 mg/L with a reported global mean in rivers of 120 mg/L. A TDS receiving environment benchmark 500 mg/L was adopted at Diavik (WLWB, 2013). Scannell and Jacobs (2001) completed a detailed review on the effects of TDS on aquatic life including fish, aquatic invertebrates, and algae focusing on Alaskan waters and TDS components that would be similar to those found in mine effluent. They found no effects to invertebrate growth and survival at concentrations below 1500 mg/L, that there was no reported range of concentrations that caused a toxic response in algae, and that fertilization and hatching rates in salmonids was the most sensitive life stage with affects at concentrations around 750 mg/L. They also concluded that toxicity was due primarily to ionic properties rather than osmotic effects. Chapman, Bailey, and Canaria (1999) completed an assessment of TDS toxicity associated with two mine effluents on chironomid (midge) larvae and early life stages of rainbow trout. They found no toxicity for rainbow trout at concentrations below 2,000 mg/L but did observe effects on chironomids at concentrations greater than 1,100 mg/L. A 2013 Effects Assessment report for the Snap Lake

Mine for De Beers Canada Inc. included results from a site-specific toxicity testing on phytoplankton, zooplankton, benthic invertebrates, and fish species and concluded that *Ceriodaphnia dubia* (a planktonic flea species) was the most sensitive test species and was affected by concentrations of 560 mg/L. A statistical review of the relationship between TDS in the range of 128 to 1,545 mg/L and phytoplankton (chlorophyll-a) in 25 Canadian Lakes by Prepas (1983) did not find a correlation.

Laboratory analysis for the 2019 CREMP water chemistry was completed by ALS Environmental, Burnaby, BC. As reported in the 2019 CREMP (Azimuth 2020), the maximum reported concentration in 2019 was 52.2 mg/L at WAL in March, consistent with the magnitude of concentrations reported in 2018. TDS concentrations in 2019 at other Meadowbank NF stations were as follows: TPE had a maximum of 23.9 mg/L; TPN a maximum of 24.1 mg/L; and SP had a maximum of 32.6 mg/L. The literature cited above suggests that the concentrations of TDS observed in the Meadowbank study area lakes are well below the concentrations where effects will occur. Furthermore, phytoplankton biomass and taxa richness have remained stable as has benthic invertebrate biomass and taxa richness confirming that primary productivity within the study area lakes is not exhibiting adverse effects from elevated TDS.

J.2.2 Conductivity

Much like TDS, specific conductivity has been used as a measurement of ionic strength (Cormier et al., 2012; USEPA, 2016). Conductivity is measured by passing an electrical current through a solution to determine conductance, or the reciprocal of resistance of a solution; therefore, it serves as an indirect measure of only ionic inorganic constituents. It does not have a relationship to dissolved organic compounds because these rarely dissociate (APHA 2018). The TDS method is applicable to waters that mostly contain calcium, magnesium, sodium, potassium, chlorate, sulphate, and chloride and TDS less than 2500 mg/L (APHA 2018). The concentration of all dissociated ions is inversely correlated to the electrical resistance of a solution. Because of the broad nature of TDS, the toxicity potential of a specific conductivity value depends on the toxicity of the ionic composition (USEPA 2016). There is no threshold for specific conductivity at the Meadowbank study area lakes and no federal guidelines.

Water quality parameters are useful indicators of potential effects of local environmental changes on freshwater ecosystems. Anthropogenic influences to water quality such as decreased dissolved oxygen is often correlated with a change in pH and an increase in conductivity, and nutrient concentrations (Leszczynska et al. 2019). The effects of these changes, especially if measured over time may not be detectable through biological monitoring. This is because aquatic communities acclimate to changes in water quality, especially those featuring natural seasonally or daily variability. Conductivity is an example of a naturally variable

parameter that not only includes highly variable toxicity but also varies in measured value in response to natural system input fluctuations (i.e. freshet, rainfall, groundwater influence) (USEPA, 2016; Hood et al. 2006).

As indicated in the 2019 CREMP, some Meadowbank study area lakes have exhibited an increase in conductivity relative to baseline/reference conditions. The mean conductivity in WAL in 2019 was 47.1 µS/cm which was the highest mean value from the Meadowbank study area. The US EPA provided a draft field-based method for developing aquatic life criteria for specific conductivity in 2016. Cormier et al. used this approach and reviewed the relationship between specific conductivity in West Virginia coal field stream systems and macroinvertebrate health to create a species sensitivity distribution and derive a benchmark relationship. The authors determined that a bench mark of 300 µS/cm was appropriate to prevent the extirpation of 95% of invertebrate genera in the study area. These results were confirmed in a separate study by Clements and Kotalik (2015).

Michelutti et al. (2002) examined the limnological conditions in 34 lakes and ponds on Victoria Island (arctic Canada) and provided a mean specific conductance of 96.4 µS/cm. Dranga et al. (2017) reviewed and compiled limnological data from 1489 shallow lakes and ponds in northern Canada and found a range of conductivity with a low of 2.5 µS/cm and a mean specific conductivity of 166 µS/cm. The authors did not find an association between trophic level or vegetation cover and conductivity but did find conductivity was affected by geological area. In comparison, Ruhland et al. (2003) summarized limnological results from 21 Canadian arctic tundra lakes and found specific conductivity ranged from 7.3 to 98.8 µS/cm with a mean of 17.8 µS/cm. The results reported in the 2019 CREMP suggests that although conductivity in the near-field Meadowbank study area lakes may be elevated compared to baseline and reference, the conductivity remains relatively low compared to other arctic lakes.

J.2.3 Silicon

Elemental silicon is highly abundant. It is relative stable and does not occur in its free form in nature but combines with oxygen and other elements to form oxides or silicates (CCME 2008). The term “silica” is often used to refer to silicon in natural waters and is usually represented by the hydrated form of the oxide (CCME 2008). It is also an essential micronutrient, particularly for diatoms. Silicon limitations can play an important role in phytoplankton dynamics (Shatwell et al. 2013; Saros et al. 2013). A change in the silicon concentrations may impact the succession of different phytoplankton species and the ratio of silicon with different nutrients may influence the ratio of cyanobacteria to diatoms. However, phytoplankton dynamics are also heavily influenced by other factors including temperature and photoperiod (Shatwell et al. 2013). As a primary producer, diatom abundance has cascading effects to higher trophic levels and in some

aquatic food chains silicon availability plays a significant role in energy transfer through effects on diatom productivity (Krause et al. 2018).

This literature review did not find any reports on potential toxic effects to aquatic receptors from low silicon concentrations similar to the concentrations observed in the Meadowbank study area lakes. In general, the conclusion of this the literature review was that there was little data to suggest potential toxicological effects from silicon to aquatic receptors at the range of concentrations that may reasonably be found in Canadian surface freshwater. There are no Canadian federal or provincial guidelines specifically for silicon in water to protect aquatic life. There are, however, several studies that report on the silica concentrations in Canadian surface waters including arctic regions. Natural silicon concentrations in Canadian surface waters are normally less than 5 mg/L silica but are highly variable ranging from 0.02 mg/L to 40 mg/L depending on region (CCME 2008). Antoniades et al. (2003) reported on chemical limnology of 24 ponds and one arctic lake from the Canadian high arctic. The authors did not report on silicon but did report that concentrations of silica (SiO_2) ranged from 0.01 to 4.05 mg/L with a mean of 1.42 mg/L and a median of 1.18 mg/L. Hamilton et al. (2001) report the physical and chemical limnology of 204 Canadian arctic lakes. They report silicate (SiO_2) concentrations for n=174 ranged from 0.05 to 6.7 mg/L with a mean of 1.1 mg/L.

The mean and median values from the arctic lake studies referenced above are higher than the silicon and silicate (SiO_2) trigger concentrations for the Meadowbank study area lakes. The concentrations in the Meadowbank lakes have remained low despite a statistically significant increase over baseline/reference conditions. The range of silicon concentrations was generally below the trigger of 0.2 mg/L with the exception of SP, which ranged up to 0.23 mg/L, and INUG, which ranged up to 0.21 mg/L. Silicate as SiO_2 was consistently below the trigger of 1.0 mg/L. Importantly, neither silicon nor silicate showed strong temporal trends associated with mining activity (see main report). Thus, the observed differences are more likely due to inherent spatial heterogeneity rather than to actual temporal changes.

The lack of substantial changes in total silicon (or silicate) suggest that changes to lower trophic communities at Meadowbank are unlikely. Based on this literature review the most likely impact from increases in total silicon would be to the phytoplankton assemblage. An increase in concentrations of silicon may favor diatoms whereas a decrease in silicon may favor cyanophytes. The species richness in the Meadowbank study area has remained relatively stable for all sample years, with no obvious changes in diatom biomass. Thus, the results of site-specific biological monitoring support the findings of the literature review that suggest changes to lower trophic communities are unlikely.

J.3 CONCLUSIONS

This literature review was conducted to provide some additional context to help assess the ecological significance of mining-related changes to water quality for parameters without effects-based water quality guidelines. The review results corroborate the findings of site-specific biological monitoring conducted under the CREMP. While changes in the parameters of interest (TDS, conductivity and total silicon) can affect lower trophic level communities, concentrations of these parameters at Meadowbank and Whale Tail remain well below concentrations associated with adverse effects reported in the literature.

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APPENDIX K
HABITAT COMPENSATION MONITORING PROGRAM: 2019

Report Version

Version	Dates	Distribution
Draft (revision 0)	February 24, 2020	Agnico Eagle (e-copy)
Final (revision 1)	March 31, 2020	Agnico Eagle (e-copy)

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

K.1. INTRODUCTION

K.1.1. Overview of the Habitat Compensation Monitoring Program

Under terms of the Department of Fisheries and Oceans Canada Fisheries Act Authorization (NU-03-0191), long-term monitoring following the Habitat Compensation Monitoring Program (HCMP) is designed to document the functionality of habitat compensation features (HCFs) constructed to offset habitat losses associated with development of the Meadowbank Mine. The monitoring strategy of the HCMP (Azimuth, 2008) describes both the physical and ecological monitoring requirements and presents the schedule for monitoring implementation and decision criteria for evaluating the success of HCF functionality. The monitoring strategy for ecological components follows a tiered framework consisting of both quantitative and qualitative tools (**Figure K-1**). The first tier focuses on identifying constraints to HCF functionality (e.g., metals release); higher tiers involve more specialized tools that are only triggered if the success criteria specified in the HCMP are not met.

In 2019, tier 1 quantitative and qualitative ecological components were monitored for both the East Dike HCF (year C+11) and for the Bay-Goose Dike HCF (year C+9). Note that C denotes year of construction completion; 2008 for the East Dike and 2010 for the Bay-Goose Dike. Azimuth was contracted to support Agnico Eagle with reporting on the periphyton component of the program (i.e., qualitative periphyton community monitoring in shallow [rock sampling] zones only); the results of which are documented herein.

K.1.2. Objectives

Periphyton species composition and biomass are indirect indicators of lake productivity, reflecting nutrient concentrations in the lake, and may sometimes indicate the presence of contaminants. This community serves as the base of the hard-bottom benthic food chain, which ultimately leads up to fish. As described in the HCMP (Azimuth, 2008), success criteria for periphyton monitoring focus on the capability of HCFs to function as fish habitat. The HCFs are expected to provide good substrate for periphyton to colonize. The intent of this component is to document periphyton community colonization and development on the dike face HCFs. This technical memorandum focuses on the 2019 and historical results related to periphyton monitoring of shallow habitat (0 – 1 m) along the dike faces. The periphyton community was directly sampled (i.e., scraped off the rocks) and analyzed for density (cells/cm^2) and biomass (µg/cm^2); with a greater emphasis placed on the latter as it is more ecologically relevant and is derived from the density counts (See **Methods Section K.2**). The results are compared to the

baseline community data and reference sites to determine whether there are any gross differences in composition.

K.2. METHODS

K.2.1. Periphyton Community Sampling – Shallow Zone

Periphyton community sampling was completed by Azimuth and Agnico Eagle staff on August 9th, 10th and 14th in 2019. Periphyton samples were collected in the following areas in relation to each dike HCF (sampling locations are shown in **Figure K-2**):

- East Dike HCF (Second Portage Lake)
    - East Dike (SP-ED)
    - Drilltrail Arm reference area (SP-DT)
- Bay-Goose Dike HCF (Third Portage Lake – East basin)
    - Bay-Goose Dike – North section (TPE-BGN)
    - Bay-Goose Dike – South section (TPE-BGS)
    - Reference area (TPE-G)

Five replicate samples were collected from each area and analyzed independently. Universal Transverse Mercator (UTM) coordinates for each replicate sample are reported in **Table K-1**. Sampling locations were chosen according to the following criteria; a sufficient number of large, flat rocks from a water depth of approximately 0.5 m with a flat surface facing upwards as much as possible, and with uniform algal coverage, not particularly dense or sparse. Periphyton growth is naturally variable due to differences in wave action, aspect to sun, water depth and clarity, nutrient availability, rock type, water temperature and other factors.

Periphyton samples were collected using a specially-designed algae 'scrubber'. The procedures for collecting the samples are outlined in detail in the standard operating procedure (SOP) for periphyton sampling (**Appendix K2**). In general, the scrubbers were used to remove and retain periphyton from a 20 cm^2 area on each rock; three rocks were composited for each replicate sample (i.e., each of the five replicates at a sampling area consisted of three rocks). Periphyton samples were preserved in the field with a small amount of Lugol's solution and sent to Plankton R Us Inc. (Winnipeg, MB) for taxonomic identification and biomass ($\mu g/cm^2$) estimation.

In the laboratory, each periphyton sample was well mixed and 2 mL sub-samples of suspension were sonicated for 10 to 20 seconds using a Sonifer Cell Disruptor (model w140) and gravity

settled for 24 hours in an Ütermohl chamber (Findlay et al., 1999). Counts were performed on an inverted microscope at magnifications of 125X, 400X, and 1200X with phase contrast illumination. Cells were identified, counted and measured from random fields until 100 cells of the dominant species were found. Cell counts were converted to wet weight biomass by approximating cell volume. Estimates of cell volume for each species were obtained by measurements of up to 50 cells of an individual species and applying the geometric formula best fitted to the shape of the cell (Vollenweider, 1968; Rott, 1981). For comparison between stations and among years, the individual species density (cells/cm^2) and biomass (µg/cm^2) data were summarized at the level of major taxa group (cyanobacteria, chlorophytes, chrysophytes, diatoms, and dinoflagellates). The laboratory data are included in **Appendix K3**.

Simpson's diversity index was calculated for each replicate sample to quantify periphyton species diversity among areas and replicates (Washington, 1984). Simpson's diversity index takes into account both the abundance patterns and taxonomic richness of the community. It measures the probability that two individuals randomly selected from a sample will belong to the same species. This is calculated by determining, for each taxonomic group at a site, the proportion of individuals that it contributes to the total at the site. This diversity index can range from 0 to 1, with a value of 1 representing the highest diversity. Simpson's diversity (D) is calculated as follows:

$$\mathrm{D} = 1 - \sum \frac{n_i(n_i - 1)}{N(N-1)}$$

where:

N is the total number of organisms/replicate sample;

n_i is the total number of organisms of the ith taxa/replicate sample.

The number of species occurring per replicate sample was calculated to measure the species richness among replicates, areas and sampling events.

K.2.2. Quality Assurance / Quality Control

The 'scrubber' and other sampling equipment was rinsed in lake water to ensure that no debris remained in the bristles between stations and between replicates.

As a measure of laboratory QA/QC on the enumeration method, replicate counts were performed on 10% of the samples. Laboratory replicate samples were chosen at random and processed at different times from the original analysis to reduce biases. The laboratory replicate is a new aliquot (10 ml) from the sample jar and is counted from the start in the same manner as

the original aliquot (10 ml) taken from the jar. An RPD of 25% for total density and total biomass concentrations is considered acceptable.

K.3. RESULTS

K.3.1. Quality Assurance / Quality Control

Periphyton samples collected from prescribed areas of rock surface were quantified by density (cells/cm^2), biomass (µg/cm^2), taxa richness (# taxa/sample), and Simpson's Diversity. RPDs for total density, taxa richness and Simpson's Diversity met the data quality objectives (DQO's) for laboratory duplicates (**Table K-2**). However, the RPD for total biomass for one of the three duplicate samples (28.5%) slightly exceeded the DQOs (**Table K-2**). While there was a slight DQO exceedance for biomass in one of the three duplicates, overall data quality is deemed acceptable for the purposes of this study.

K.3.2. East Dike HCF

Periphyton samples were collected from rock surfaces at 5 locations each along the East Dike face (SP-ED) and at the reference location (SP-DT). Density and biomass were both highly variable within each location in 2019, but mean estimates of cell density and biomass were both approximately 2-fold and 3-fold lower at the SP-ED area compared to SP-DT, respectively (**Table K-3**, **Figure K-3** and **Figure K-4**). Relative to the 2017 survey, in 2019 the mean cell density across East Dike stations increased by 35% (i.e., from 469,000 to 635,359 cells/cm^2) and the mean biomass increased by 63% (i.e., from 152 to 247 µg/cm^2).

Despite absolute differences in cell density and total biomass between the East Dike and the reference areas, the proportion of cell densities and the proportion of biomass by major taxa group was similar between SP-ED and SP-DT in 2019 (**Table K-3**, **Figure K-3** and **Figure K-4**). Cyanobacteria and diatoms accounted for nearly 100% of the cell density at SP-ED and SP-DT. At SP-ED, cyanobacteria comprised 61% of the periphyton community compared with 67% at SP-DT (**Table K-3**). Diatoms were the next most abundant major taxon, accounting for 38% of the cell density at SP-ED compared with 31% at SP-DT. In 2019, the biomass was comprised almost equally of cyanobacteria (49%) and diatoms (46%) at SP-ED. Similarly, the biomass at SP-DT was comprised mostly of cyanobacteria (49%) and diatoms (34%).

In 2015 and 2017, diatoms were the dominant major taxon at SP-ED (see **Figure K-3** and **Figure K-4**). 2019 is the first study year where cyanobacteria colonization at SP-ED reached a proportionally comparable level in terms of density and biomass to SP-DT (see **Appendix K4** for information on the species cell volumes and presence/absence by replicate area). In 2019, the

community composition at SP-ED is similar to the composition at the reference station SP-DT. Differences in species composition within major taxa groups (i.e., cyanobacteria) suggest community succession at SP-ED is now comparable to the reference station SP-DT.

Community diversity indices (Simpson's Diversity and taxa richness) were similar at all sampling areas (**Table K-3**). Taxa richness in 2019 was between 14 and 18 at SP-ED and between 15 and 20 at SP-DT, consistent with the number of taxa observed in 2017 (Azimuth, 2018). The mean Simpson's Diversity was also similar between the two areas; 0.81 at SP-ED and 0.77 at SP-DT.

K.3.3. Bay-Goose Dike HCF

Periphyton samples were collected from rock surfaces at 5 locations each along the north and south sections of the Bay-Goose Dike (TPE-BGN; TPE-BGS) and at the reference location TPE-G (**Table K-4**, **Figure K-5** and **Figure K-6**). The 2019 event was the fourth cycle of habitat compensation monitoring along the Bay-Goose Dike, with the first, second and third conducted in 2011, 2015 and 2017, respectively (**Table K-5**). Periphyton total cell density at TPE-BGN and TPE-BGS in 2019 was approximately 73,000 cells/cm^2 and 80,800 cell/cm^2, respectively. In 2019, both Bay-Goose Dike locations were approximately 10-fold lower in cell density compared to the reference area (TPE-G), consistent with the ratio that was observed in the 2017 and 2015 surveys (**Figure K-5**). In 2019, the periphyton community at both TPE-BGN and TPE-BGS was composed mainly of diatoms (64% and 61% by cell density, respectively). In contrast, the community at TPE-G was composed primarily of cyanobacteria (83%) and diatoms (14%), which was similar to what was observed in 2017 (**Table K-4**).

The proportion of biomass observed in 2019 was highest for cyanobacteria at TPE-BGN (60%) which was similar to the proportion of cyanobacteria observed at TPE-G (67%) (**Table K-4**). However, there were more taxa contributing to biomass at TPE-G than at TPE-BGN (e.g., there were no chlorophytes at TPE-BGN compared to 12% at TPE-G). The chlorophyte results for biomass at TPE-BGS were heavily influenced by one replicate (replicate 5) which highlights the within-station variability (**Table K-4**). Mean total biomass was similar between 2017 and 2019 at TPE-BGN (17 µg/cm^2 in 2017 and 24 µg/cm^2 in 2019) and was lower at TPE-BGS than in 2017 (57 µg/cm^2 in 2017 and 22.4 µg/cm^2 2019) (**Figure K-6**).

Compared to the 2015 and 2017 results, the 2019 periphyton community data along the Bay-Goose Dike impact stations had similar proportions of diatoms in terms of cell density. The relative density of cyanobacteria was higher at TPE-BGN than TPE-BGS due to the presence of chlorophytes at TPE-BGS. In 2019, the biomass at TPE-BGS was more or less evenly distributed between cyanobacteria (30%), chlorophytes (30%) and diatoms (37%), unlike in 2017, where chlorophytes dominated the station with nearly 66% of total biomass. In 2019, relative biomass for cyanobacteria was proportionally higher at both TPE-BGN and TPE-BGS compared to 2017

(**Figure K-5**). Furthermore, the relative biomass for chlorophytes appeared to be proportionally lower at TPE-BGN and TPE-BGS in 2019 compared to 2017(**Figure K-5**).

The periphyton community at the Bay-Goose Dike was less diverse than the reference area as indicated by lower Simpson's Diversity scores and fewer taxa (**Table K-4**). Mean taxa at TPE-BGN (11 taxa) and TPE-BGS (10 taxa) were lower than the mean number of taxa at TPE-G (15 taxa). In 2019, the taxa richness at both TPE-BGN and TPE-BGS were comparable to 2017 data. Simpson's Diversity scores were higher at both TPE-BGN and TPE-BGS in 2019 compared with 2017. At TPE-BGN, richness was 11 in 2019 compared to 12 in 2017, and Simpson's Diversity was 0.63 in 2019 compared to 0.55 in 2017. Overall, TPE-BGN had slightly higher Simpson's Diversity, species richness and biomass but lower cell density, compared to TPE-BGS in 2019.

Relative to SP-ED, the patterns of colonization and succession seen at TPE-BGN and TPE-BGS have been generally slower and more variable. For 2015, 2017, and 2019 the relative biomass and relative density at TPE-G has been dominated by cyanobacteria (**Figure K-5** and **Figure K-6**). The 2019 results show progress along the Bay-Goose Dike towards a more heterogeneous periphyton community comprised of cyanobacteria and diatom species (e.g., similar to the reference area). The relative biomass of cyanobacteria has increased at TPE-BGN and to a lesser extent at TPE-BGS compared to proportions observed in 2017. Temporal changes at the reference area (TPE-G) relative to 2017 show overall increased biomass but a slight decrease in the Simpson's Diversity index. In comparison, TPE-BGN showed increased biomass, slightly lower mean total taxa and an increase in Simpson's Diversity. In 2019, TPE-BGS decreased in biomass but had a higher Simpson's Diversity index relative to 2017. These results highlight both the temporal and spatial variability in the periphyton communities. A full list of periphyton species with a presence/absence matrix for the Third Portage sampling locations in 2019 is presented in **Appendix K4**.

K.4. OVERALL DISCUSSION AND CONCLUSIONS

Periphyton monitoring under the HCMP tracks the development of attached algal communities on the faces of the East Dike HCF (since 2009) and Bay-Goose Dike HCF (since 2011). Periphyton community development is dependent on a number of factors, including nutrient availability (Bonilla et al., 2005), light (Kiffney et al., 2003) and the capacity of different taxa to colonize, grow, compete, tolerate stress, and resist loss processes (Cox, 1990). In early-stage periphyton communities at the East Dike and Bay-Goose Dike HCFs, diatoms were the predominant taxa group colonizing the new substrate. However, this has shifted over the years to a more heterogeneous mix of cyanobacteria, diatoms, and to a lesser extent, chlorophyte taxa at both the East Dike and Bay-Goose Dike HCFs.

Biomass steadily increased on the HCFs in Second Portage and Third Portage Lakes in the post-dike construction phase up to 2017. In 2019, a slight decrease in biomass was observed on all the HCFs in Second Portage and Third Portage Lakes except at TPE-G, which showed an increase in biomass compared to previous sampling years. In 2019, the total biomass at each site was still lower compared to the reference areas (particularly at the Bay-Goose Dike HCFs). It is apparent that these communities take time to develop and it appears that a decade is not sufficient for full colonization of new barren rock surfaces to background levels of biomass. The presence of a structurally similar periphyton community at each of the HCFs relative to their respective reference areas indicates a healthy periphyton community. While total biomass growth is still expected as periphyton community succession progresses, there may be variation from year to year, due to factors aforementioned.

Overall, the progress at the Bay-Goose Dike towards a heterogenous periphyton community has been slower than what has been observed for SP-ED; however, in 2019 some progress was made at each area (i.e., higher diversity at TPE-BGN and TPE-BGS and higher biomass at TPE-BGN). At the East Dike HCF, taxa richness and Simpson's Diversity values are nearly identical to the reference area in Second Portage Lake indicating the presence of a community similar to background conditions, as was the case in 2017.

While in previous years a more abundant (biomass and density) and diverse (taxa richness and Simpson's Diversity) periphyton community was observed at the southern extent of Bay-Goose Dike compared to the northern portion of the Dike, the same pattern was not observed in 2019. While this does not align with the 2017 suggestion that the southern aspect at TPE-BGS provides better growing conditions (i.e., exposure to sunlight) than the eastern aspect at TPE-BGN, it may be attributed to natural variability in the data. Furthermore, as was observed in 2017, the temporal biomass trajectory seen at the SP-ED (eastern aspect) is similar to that seen at TPE-BGS (southern aspect) **(Appendix K1**). Interestingly, while mean diversity metrics at TPE-BGS were lower than at TPE-BGN, some of the results for individual replicates were actually higher, highlighting the influence of high natural variability in periphyton data.

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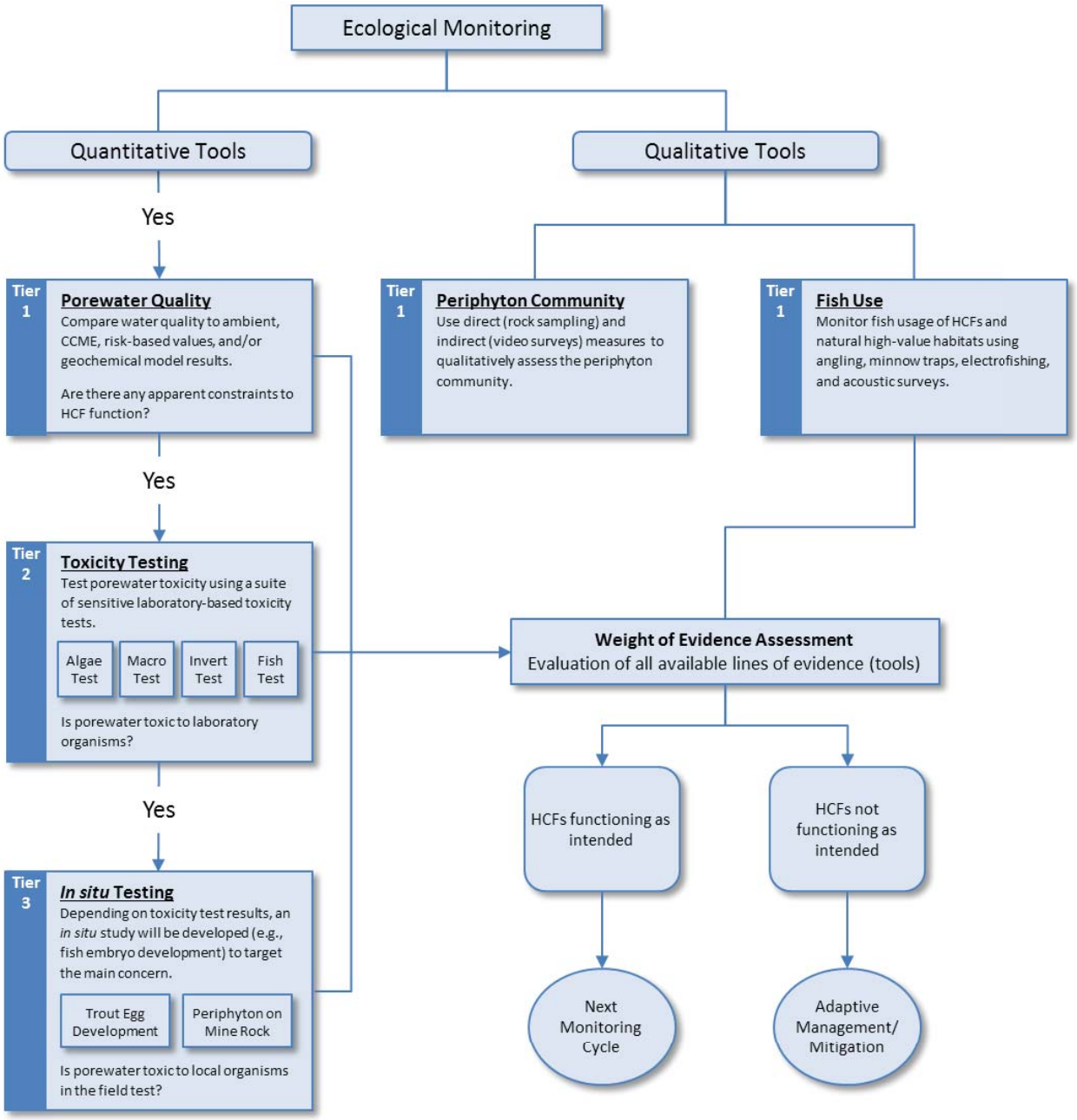
FIGURES AND TABLES

Figure K-1. Ecological monitoring strategy for habitat compensation features (HCFs), Meadowbank Mine (adapted from Azimuth, 2008).



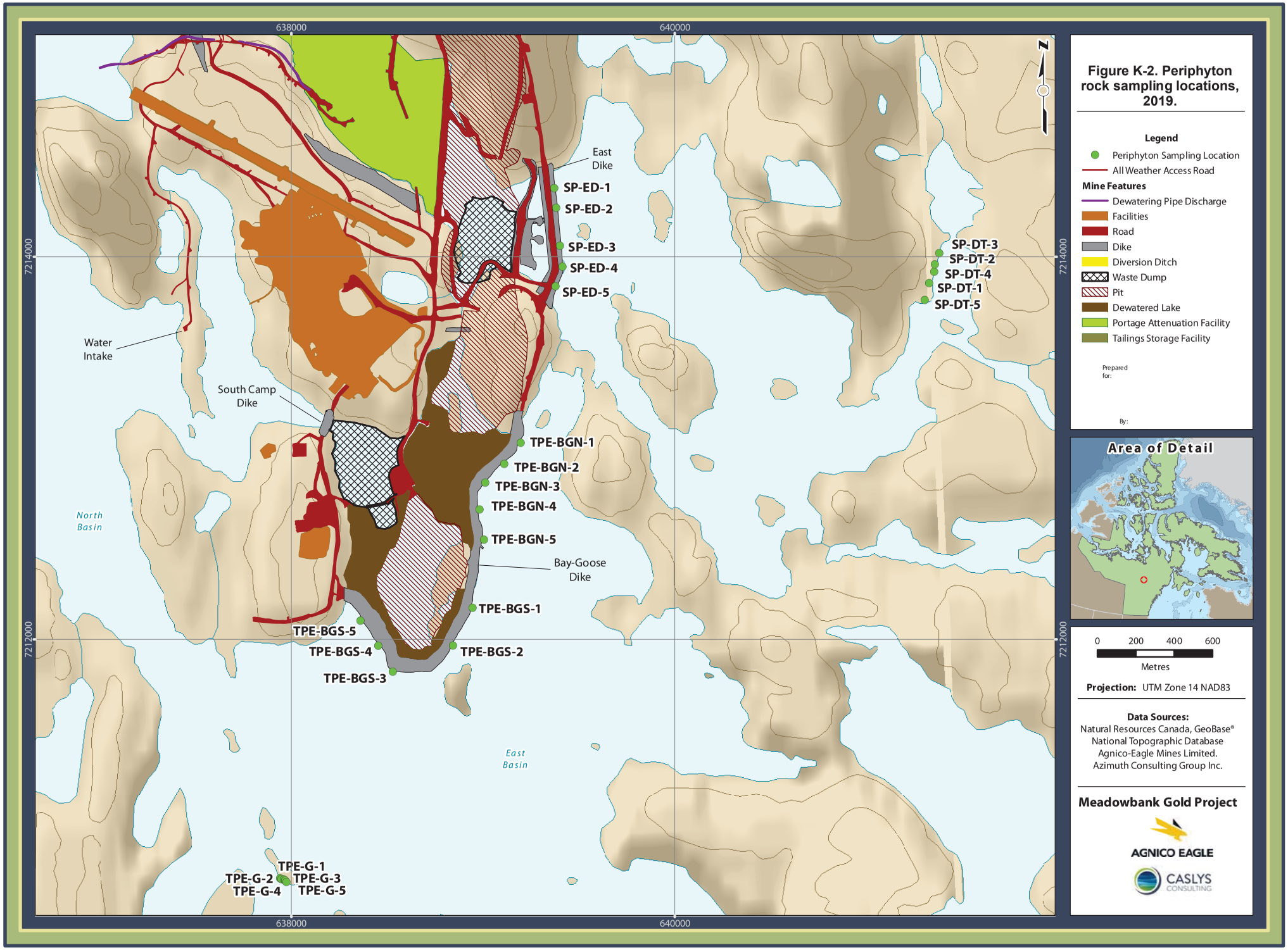

638000
640000
7214000
7212000
N
East Dike
SP-ED-1
SP-ED-2
SP-ED-3
SP-ED-4
SP-ED-5
SP-DT-3
SP-DT-2
SP-DT-4
SP-DT-1
SP-DT-5
Water Intake
South Camp Dike
TPE-BGN-1
TPE-BGN-2
TPE-BGN-3
TPE-BGN-4
TPE-BGN-5
Bay-Goose Dike
TPE-BGS-1
TPE-BGS-5
TPE-BGS-4
TPE-BGS-2
TPE-BGS-3
North Basin
East Basin
TPE-G-1
TPE-G-2
TPE-G-3
TPE-G-4
TPE-G-5
Figure K-2. Periphyton rock sampling locations, 2019.
Legend
Periphyton Sampling Location
All Weather Access Road
Mine Features
Dewatering Pipe Discharge
Facilities
Road
Dike
Diversion Ditch
Waste Dump
Pit
Dewatered Lake
Portage Attenuation Facility
Tailings Storage Facility
Prepared for:
By:
Area of Detail
0 200 400 600
Metres
Projection: UTM Zone 14 NAD83
Data Sources:
Natural Resources Canada, GeoBase®
National Topographic Database
Agnico-Eagle Mines Limited.
Azimuth Consulting Group Inc.
Meadowbank Gold Project
AGNICO EAGLE
CASLYS CONSULTING

Figure K-3. Mean and relative periphyton biomass (µg/cm²) for major taxa groups at East Dike HCF sampling areas.

Figure K-4. Mean and relative periphyton density (cells/cm^2) for major taxa groups at East Dike HCF sampling areas.

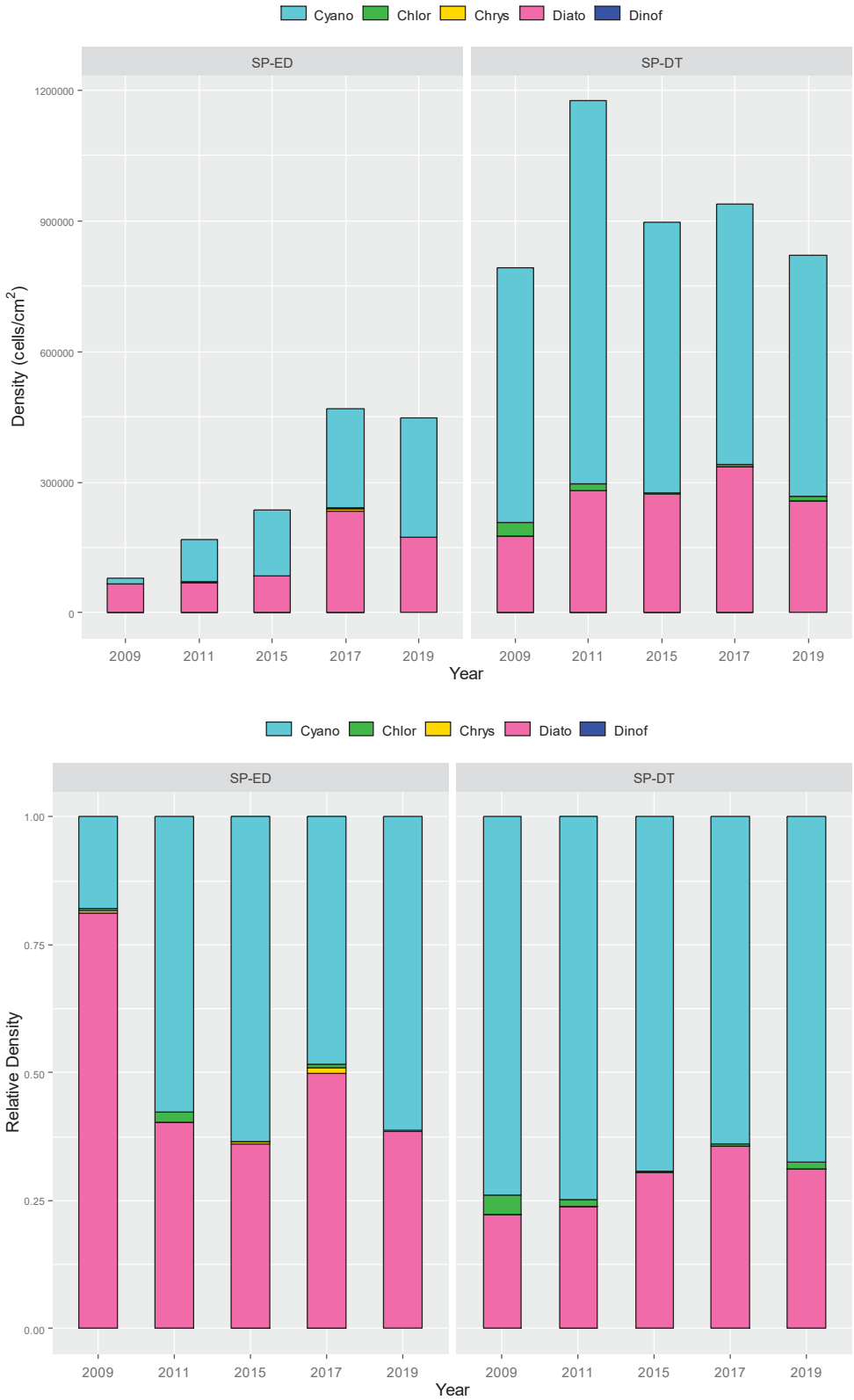


Figure K-5. Mean and relative periphyton biomass (µg/cm²) for major taxa groups at Bay-Goose Dike HCF sampling areas.

Figure K-6. Mean and relative periphyton density (cells/cm^2) for major taxa groups at Bay-Goose Dike HCF sampling areas.

Table K-1. Periphyton rock sampling locations, 2019.

HCF	Sampling Area ID	Date	Replicate #	UTM Coordinates	
				Easting	Northing
East Dike HCF	SP-ED	14-Aug-19	1	14W 63937[1]	7214346
			2	14W 639379	7214291
			3	14W 639398	7214086
			4	14W 639414	7213945
			5	14W 639383	7213854
	SP-DT	14-Aug-19	1	15W 358683	7213915
			2	15W 358703	7213952
			3	15W 358729	7214021
			4	14W 641324	7213847
			5	14W 641314	7213780
Bay-Goose Dike HCF	TPE-BGN	9-Aug-19	1	14W 639188	7213013
			2	14W 639100	7212914
			3	14W 639040	7212848
			4	14W 638982	7212651
			5	14W 639003	7212499
	TPE-BGS	10-Aug-19	1	14W 638943	7212160
			2	14W 638838	7211954
			3	14W 638515	7211834
		9-Aug-19	4	14W 638448	7211978
			5	14W 638352	7212101
	TPE-G	10-Aug-19	1	14W 637932	7210750
			2	14W 637951	7210745
			3	14W 637963	7210734
			4	14W 637974	7210730
			5	14W 637980	7210727

Notes:

1 Missing last digit of coordinate.

Table K-2. QA/QC results for the laboratory duplicate periphyton samples.

	Laboratory Duplicates								
	SP-DT-3 14-Aug-19	**Lab Duplicate**	**RPD (%)**	**SP-ED-4 14-Aug-19**	**Lab Duplicate**	**RPD (%)**	**TPE-BGN-2 09-Aug-19**	**Lab Duplicate**	**RPD (%)**
Total Density	1013853	942076	7.3	516244	478975	7.5	54910	62087	-12.3
Total Biomass	444	409	8.0	159.4	159.5	0.0	15	20	-28.5
# Taxa	15	18	-18.2	17	19	-11.1	11	11	0.0
Simpsons Diversity	0.83	0.79	5.0	0.94	0.82	14.4	0.58	0.59	-0.6

Notes:

RPD = Relative Percent Difference (%) = ((original - duplicate) / (original + duplicate)/2) x 100.

Shaded RPDs exceed 25% (lab duplicates).

NA = Not Applicable for rare species.

Table K-3. Density (cells/cm^2), biomass (µg/cm^2) and diversity of major periphyton taxa groups for East Dike HCF sampling areas.

Area-Replicate ID	Date	Cyanobacteria	Chlorophyte	Chrysophyte	Diatom	Dinoflagellate	Total	# Taxa	Simpson's Diversity
Periphyton Density (cells/cm^2)									
SP-ED-1	14-Aug-19	367858	0	0	139966	0	507824	15	0.75
SP-ED-2	14-Aug-19	231781	0	0	167480	0	399261	16	0.81
SP-ED-3	14-Aug-19	88341	2761	0	241558	0	332660	18	0.76
SP-ED-4	14-Aug-19	285728	6902	0	223614	0	516244	17	0.94
SP-ED-5	14-Aug-19	398916	0	0	89722	0	488637	14	0.79
	station mean	***274525***	***1932***	***0***	***172468***	***0***	***448925***	***16***	***0.81***
	as %	***61%***	***0.43%***	***0.0%***	***38%***	***0%***			
SP-DT-1	14-Aug-19	541918	21533	0	330175	0	893626	18	0.72
SP-DT-2	14-Aug-19	610106	15381	0	76904	0	702391	15	0.76
SP-DT-3	14-Aug-19	756651	11963	0	245239	0	1013853	15	0.83
SP-DT-4	14-Aug-19	424682	5981	0	424682	0	855345	20	0.76
SP-DT-5	14-Aug-19	437392	0	0	206359	0	643752	15	0.80
	station mean	***554150***	***10972***	***0***	***256672***	***0***	***821793***	***17***	***0.77***
	as %	***67%***	***1.3%***	***0%***	***31%***	***0%***			
Periphyton Biomass (µg/cm^2)									
SP-ED-1	14-Aug-19	127	0.0	0.0	46	0	173		
SP-ED-2	14-Aug-19	35	0	0.0	48	0	83		
SP-ED-3	14-Aug-19	40.3	4.8	0.0	95	0	140		
SP-ED-4	14-Aug-19	74.2	23.9	0.0	61	0	159		
SP-ED-5	14-Aug-19	29.2	0.0	0.0	35	0	64		
	station mean	***61.2***	***5.7***	***0.0***	***57***	***0***	***124***		
	as %	***49%***	***4.6%***	***0.0%***	***46%***	***0%***			
SP-DT-1	14-Aug-19	104	146.1	0.0	98	0	348		
SP-DT-2	14-Aug-19	233	163.4	0.0	52	0	448		
SP-DT-3	14-Aug-19	257	12.2	0.0	175	0	444		
SP-DT-4	14-Aug-19	84	7.8	0.0	208	0	299		
SP-DT-5	14-Aug-19	221	0.0	0.0	90	0	310		
	station mean	***180***	***65.9***	***0***	***124***	***0***	***370***		
	as %	***49%***	***17.8%***	***0%***	***34%***	***0%***			

Table K-4. Density (cells/cm²), biomass (µg/cm²) and diversity of major periphyton taxa groups for Bay-Goose Dike HCF sampling areas.

Area-Replicate ID	Date	Cyanobacteria	Chlorophyte	Chrysophyte	Diatom	Dinoflagellate	Total	# Taxa	Simpson's Diversity
				Periphyton Density (cells/cm²)					
TPE-BGN-1	09-Aug-19	22,879	0	0	50,693	0	73,572	10	0.57
TPE-BGN-2	09-Aug-19	12,920	0	2,153	39,836	0	54,910	11	0.58
TPE-BGN-3	09-Aug-19	40,823	0	0	51,141	0	91,965	11	0.70
TPE-BGN-4	09-Aug-19	24,763	0	2,153	42,349	0	69,265	13	0.68
TPE-BGN-5	09-Aug-19	24,763	0	0	50,603	0	75,366	11	0.60
	station mean	***25,230***	***0***	***861***	***46,924***	***0***	***73,015***	***11***	***0.63***
	as %	***35%***	***0.0%***	***1.2%***	***64%***	***0.0%***			
TPE-BGS-1	10-Aug-19	7895	0	0	44502	0	52397	5	0.29
TPE-BGS-2	10-Aug-19	17585	0	3230	50603	0	71418	13	0.72
TPE-BGS-3	09-Aug-19	6819	0	2153	36606	0	45579	9	0.54
TPE-BGS-4	09-Aug-19	19021	4307	1436	44143	0	68906	11	0.66
TPE-BGS-5	09-Aug-19	56225	35290	3589	70581	0	165686	14	0.79
	station mean	***21509***	***7919***	***2082***	***49287***	***0***	***80797***	***10***	***0.60***
	as %	***27%***	***9.8%***	***2.6%***	***61%***	***0.0%***			
TPE-G-1	10-Aug-19	333764	3589	16150	37683	0	391186	15	0.63
TPE-G-2	10-Aug-19	488982	13458	0	87478	0	589919	13	0.78
TPE-G-3	10-Aug-19	568236	2991	29907	119629	0	720763	14	0.78
TPE-G-4	10-Aug-19	954039	35889	0	209350	0	1199277	17	0.56
TPE-G-5	10-Aug-19	1173557	28711	21533	132788	0	1356589	15	0.80
	station mean	***703716***	***16927***	***13518***	***117386***	***0***	***851547***	***15***	***0.71***
	as %	***83%***	***2.0%***	***1.6%***	***14%***	***0.00%***			

Area-Replicate ID	Date	Cyanobacteria	Chlorophyte	Chrysophyte	Diatom	Dinoflagellate	Total
			Periphyton Biomass (µg/cm²)				
TPE-BGN-1	09-Aug-19	8.7	0.0	0.0	7.8	0.0	16.4
TPE-BGN-2	09-Aug-19	8.9	0.0	0.5	5.8	0.0	15.2
TPE-BGN-3	09-Aug-19	36.9	0.0	0.0	15.4	0.0	52.3
TPE-BGN-4	09-Aug-19	14.2	0.0	0.5	9.7	0.0	24.4
TPE-BGN-5	09-Aug-19	3.5	0.0	0.0	8.1	0.0	11.7
	station mean	***14.4***	***0.0***	***0.2***	***9.4***	***0.0***	***24.0***
	as %	***60%***	***0.0%***	***0.8%***	***39%***	***0.0%***	
TPE-BGS-1	10-Aug-19	0.6	0.0	0.0	6.4	0.0	7.0
TPE-BGS-2	10-Aug-19	1.4	0.0	0.7	14.7	0.0	16.8
TPE-BGS-3	09-Aug-19	0.7	0.0	0.5	4.1	0.0	5.3
TPE-BGS-4	09-Aug-19	8.2	5.8	0.3	5.2	0.0	19.6
TPE-BGS-5	09-Aug-19	23.1	28.0	0.8	11.4	0.0	63.3
	station mean	***6.8***	***6.8***	***0.5***	***8.4***	***0.0***	***22.4***
	as %	***30%***	***30.2%***	***2.1%***	***37%***	***0.0%***	
TPE-G-1	10-Aug-19	295.5	12.1	3.7	15.0	0.0	326.3
TPE-G-2	10-Aug-19	239.7	72.9	0.0	97.9	0.0	410.6
TPE-G-3	10-Aug-19	154.2	12.0	6.8	91.9	0.0	264.9
TPE-G-4	10-Aug-19	345.2	93.0	0.0	173.0	0.0	611.2
TPE-G-5	10-Aug-19	671.0	124.6	4.9	118.6	0.0	919.1
	Station mean	***341.1***	***62.9***	***3.1***	***99.3***	***0.0***	***506.4***
	as %	***67%***	***12%***	***0.6%***	***20%***	***0.0%***	

Table K-5. Mean total (± SD) periphyton biomass (µg/cm²) at both dike HCF areas since 2007.

Year [1]	East Dike HCF Areas			Bay-Goose Dike HCF Areas			
	SP-ED	SP-CREMP	SP-DT	TPE- BGN	TPE-BGS	TPE-CREMP	TPE-G
2007		628 ± 352				482 ± 235	
2008		546 ± 183				372 ± 148	
2009	23 ± 13	549 ± 256	438 ± 265				
2010		270 ± 98	308 ± 113				
2011	43 ± 16	316 ± 35	316 ± 61	16 ± 13	16 ± 15	855 ± 332	480 ± 138
2012							
2013							
2014							
2015	79 ± 57		344 ± 147	22 ± 19	44 ± 46		270 ± 124
2017	152 ± 63		408 ± 110	17 ± 10	57 ± 88		370 ± 227
2019	124 ± 48		370 ± 72	24 ± 16	22 ± 24		506 ± 265

Notes:

Red dashed line indicates when dike construction was finished in each area (i.e., the year above the red line).

1 Starting in 2015, the HCMP program was only conducted every two years.

APPENDIX K1
HISTORICAL PERIPHYTON RESULTS

LIST OF FIGURES – APPENDIX K1

Figure K1-1. Mean and relative periphyton biomass (µg/cm²) for major taxa groups at East Dike HCF sampling areas, 2007-2019.

Figure K1-2. Mean and relative periphyton density (cells/cm²) for major taxa groups at East Dike HCF sampling areas, 2007-2019.

Figure K1-3. Mean and relative periphyton biomass (µg/cm²) for major taxa groups at Bay-Goose Dike HCF sampling areas, 2007-2019.

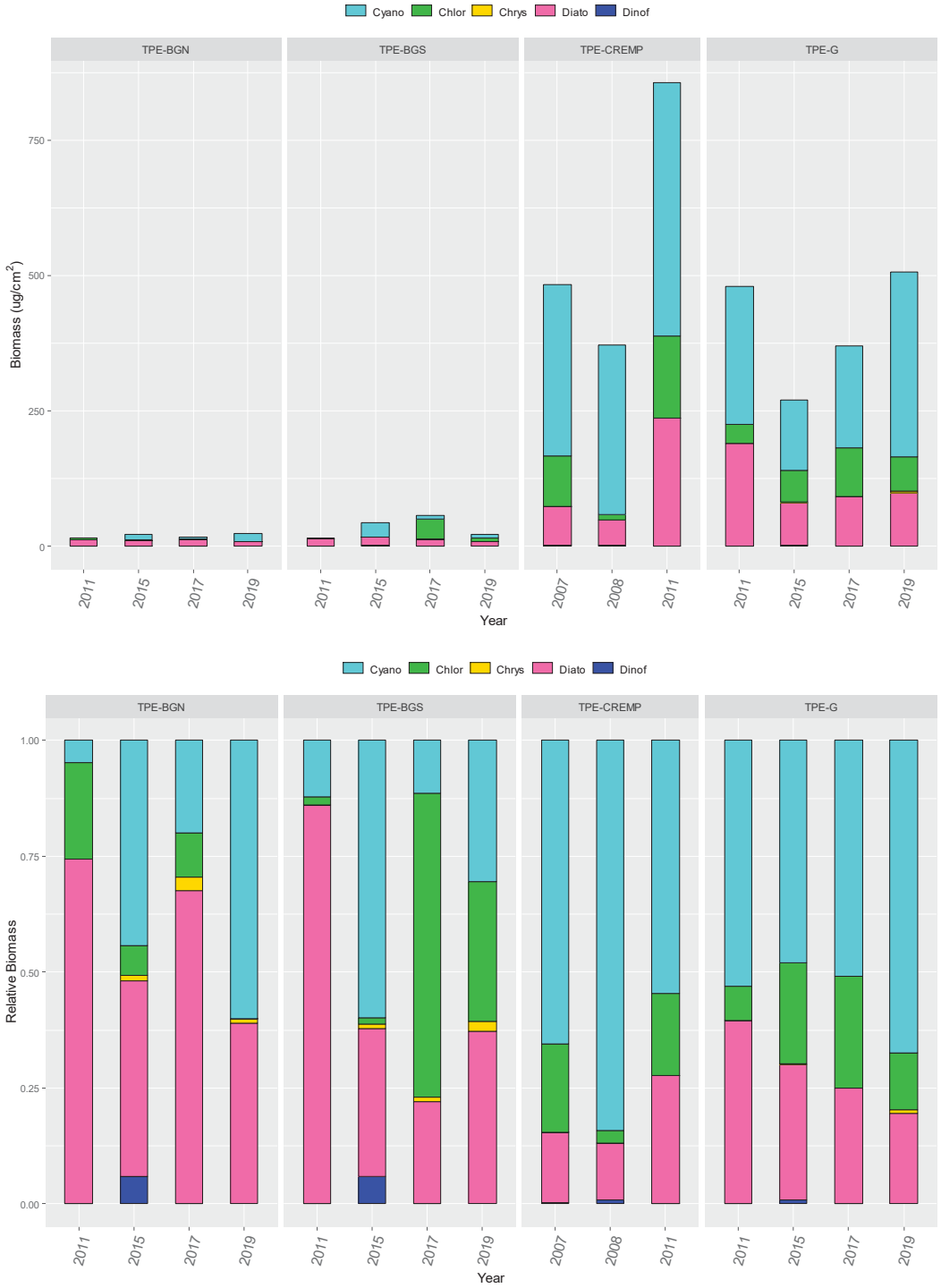


Figure K1-4. Mean and relative periphyton density (cells/cm²) for major taxa groups at Bay-Goose Dike HCF sampling areas, 2007-2019.

APPENDIX K2
HCMP PERIPHYTON SAMPLING - STANDARD OPERATING PROCEDURES

<u>Standard Operating Procedure</u>
Meadowbank Lakes Project
HCM Periphyton Sampling

Equipment

- Field collection data forms (printed on waterproof paper), pencils, waterproof markers & clipboard
- GPS unit, batteries
- Periphyton sampler, syringes & plastic tubes
- Binder clips (to pinch tubes on periphyton sampler)
- Shoulder gloves (with 5 cm increments marked from fingertip to shoulder)
- Large tote
- Field sample bottles & preservative (per replicate):
- 1 – 500 mL plastic jar
- 1 syringe & Lugol's solution
- Cooler(s) or action packer(s) (for storing and shipping samples)
- Address labels for cooler(s)/action packer(s)
- Chain-of-custody forms
- Large Ziploc bag (for sending chain-of-custody form in cooler)
- Packing tape (for sealing cooler)

General Procedures

Before going into the field, label all sampling containers. Using a permanent waterproof marker, print the following information directly onto both the jar and jar lid:

- Azimuth company name
- Station abbreviation (e.g. SP-ED) and replicate number (e.g. SP-ED -1, SP-ED-2)
- Date of sample collection

Before and during sampling, fill in the requested information on the field data form using a lead pencil or Rite-in-the-rain pen.

Access to the area may be by boat or foot; in either event, ensure the sampling area is not impacted by boat (launch) or other anthropogenic activities. Record the UTM coordinates for each sampling station, measured using a GPS unit in NAD 83, on the field data form. In future sampling events, sample periphyton from the same locations.

Select a rock with a flat surface, **no more than 0.5 meter below the water surface**, with the following criteria:

- Facing up as much as possible; if not, with a small slope[1]
- Uniform algal coverage, not uniformly dense or sparse

The periphyton sampler is a specially designed scrubber, consisting of a plexiglass tube with a plunger that fits snugly inside and a distal wire brush that comes in direct contact with the rock surface. Press the tube against the rock to form a tight seal. To detach the periphyton colonies, depress the plunger and twist for approximately 30 half turns. The periphyton mixture is suspended by opening the plunger approximately ¼ of the device volume and drawn into a syringe that is attached to the tube. Pinch intake tube closed when drawing suspension into syringe. Empty the syringe, pinch output tube closed prior to detaching the syringe, into the pre-labeled replicate 1 sampling container (i.e., TPE-CREMP-1). Continue scraping and syringing (approximately two times: another 20 half turns of the sampler, then 10 half turns, then a final rinse of sampler) until all visible periphyton are completely removed from the rock surface. This procedure works well with two people; one to scrub the rocks and clamp the intake tube, the other to operate the syringe and clamp the output tube. The number of turns in this SOP is conservative and may be too many for the average sampling site. Use discretion and examine each sampled rock to ensure it has been fully cleaned where the scrubber was used.

Repeat rock selection and scrubbing steps two more times, selecting undisturbed flat rocks in less than 0.5 meter of water. Put the collected periphyton samples from each rock into the same pre-labeled replicate 1 sampling container (i.e. TPE-1) as above. These three rocks are composited into one replicate sample; approximately 500 mL of water/periphyton are collected in total.

Repeat above steps for each replicate required at the station. For every 125 mL of periphyton mixture in each sampling container, add 1 mL of Lugol's solution to preserve the sample (the sample should look the colour of weak tea). Seal the sampling containers and store in a cooler at room temperature.

Fill out a chain-of-custody form completely and place into a sealed Ziploc plastic bag inside the shipping container. If using digital COC form, print two copies of the document in the field, one copy for the laboratory and one for Azimuth. Questions about COCs can be directed to Eric Franz.

Meadowbank HCM Periphyton Scrubbing

- Collect periphyton scrubbing samples from 5 stations within SP and TPE
- Revisit the following SP stations: SP-DT and SP-ED

[1] Along the dike face it may be necessary to set up a tote to receive the rock. If the aspect of the dike face is too steep to safely or properly sample in-situ place the rock in the tote in the boat. It must hold enough water to cover the sampled rock so that the plunger works properly. Make sure the tote is clean after each sample.

- Include the following TPE stations: TPE-BGN, TPE-BGS and TPE-G (reference site)
- Each station consists of 5 replicate samples (four stations are close together and the two dike stations are close together more spread out)
- Each sample replicate will consist of scrubbings from three rocks and will be placed in a 500 mL jar and preserved with Lugol's solution
- Ship samples and COC to David Findlay at Plankton R Us

  Plankton R Us Inc.
  39 Alburg Drive
  Winnipeg, MB R2N 1M1
  Tel: 204-254-7952

APPENDIX K3
PERIPHYTON LABORATORY DATA

Table K3-1. Habitat Compensation Monitoring Program Periphyton Laboratory Data, 2019.

Epilithic (EI) algal species data for CREMP 2019 (for Azimuth consulting group)

**** 1st number in species code = group 1=cyanobacteria 2=chlorophyte 5=diatoms 7=Dinoflagellates**

**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
SP - DT	1	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	39477	14.76	119.00	2.00	373.80
SP - DT	1	14-Aug-19	1084	Gloeocapsa punctata	93310	3.13	4.00	4.00	33.50
SP - DT	1	14-Aug-19	1086	Calothrix sp.	3589	15.41	82.00	10.00	4293.50
SP - DT	1	14-Aug-19	1124	Petalonema alatum Berk	21533	42.01	69.00	6.00	1950.90
SP - DT	1	14-Aug-19	1131	Heteroleibeinia profunda Komarek	369653	25.10	21.60	2.00	67.90
SP - DT	1	14-Aug-19	1136	Lyngbya mucicola Lemmermann	10767	0.48	57.00	1.00	44.80
SP - DT	1	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	3589	2.77	96.00	3.20	772.10
SP - DT	1	14-Aug-19	2205	Mougeotia sp.	21533	146.12	60.00	12.00	6785.80
SP - DT	1	14-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	3589	2.77	82.00	6.00	772.80
SP - DT	1	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	17944	36.08	30.00	16.00	2010.60
SP - DT	1	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	3589	0.21	56.00	2.00	58.60
SP - DT	1	14-Aug-19	5702	Achnanthes minutissima Kutzing	269165	22.56	20.00	4.00	83.80
SP - DT	1	14-Aug-19	5820	Eunotia arcus Ehrenberg	10767	16.24	40.00	12.00	1508.00
SP - DT	1	14-Aug-19	5854	Pinnularia borealis Ehrenberg	3589	6.11	65.00	10.00	1701.70
SP - DT	1	14-Aug-19	5860	Diatoma vulgare Bory	3589	2.36	31.00	9.00	657.40
SP - DT	1	14-Aug-19	5870	Navicula radiosa Kutzing	3589	6.67	71.00	10.00	1858.80
SP - DT	1	14-Aug-19	5873	Gomphonema minutum	3589	1.56	26.00	8.00	435.60
SP - DT	1	14-Aug-19	5882	Anomoenies vitrea Ross	10767	3.65	36.00	6.00	339.30
SP - DT	2	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	258911	12.19	15.00	2.00	47.10
SP - DT	2	14-Aug-19	1086	Calothrix sp.	35889	125.08	90.00	8.60	3485.30
SP - DT	2	14-Aug-19	1124	Petalonema alatum Berk	25635	57.26	79.00	6.00	2233.70
SP - DT	2	14-Aug-19	1131	Heteroleibeinia profunda Komarek	207641	12.65	19.40	2.00	60.90
SP - DT	2	14-Aug-19	1136	Lyngbya mucicola Lemmermann	38452	1.66	55.00	1.00	43.20
SP - DT	2	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	43579	24.18	69.00	3.20	554.90
SP - DT	2	14-Aug-19	2205	Mougeotia sp.	15381	163.37	69.00	14.00	10621.70
SP - DT	2	14-Aug-19	5311	Cymbella minuta Kutzing	2563	1.01	15.60	8.00	392.10
SP - DT	2	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	17944	25.78	28.00	14.00	1436.80
SP - DT	2	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	5127	0.34	63.00	2.00	66.00
SP - DT	2	14-Aug-19	5702	Achnanthes minutissima Kutzing	41016	3.61	21.00	4.00	88.00
SP - DT	2	14-Aug-19	5726	Eucocconeis sp.	2563	10.74	40.00	20.00	4188.80
SP - DT	2	14-Aug-19	5836	Encyonema silesiacum (Bleisch) D.G. Mann	2563	3.02	30.00	10.00	1178.10
SP - DT	2	14-Aug-19	5875	Cocconies disculus Schum.	2563	6.52	30.00	18.00	2544.70
SP - DT	2	14-Aug-19	5910	Navicula exigua (Greg.) Muller	2563	0.97	40.00	6.00	377.00
SP - DT	3	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	119629	44.72	119.00	2.00	373.80
SP - DT	3	14-Aug-19	1070	Anabaenopsis sp.	29907	0.42	3.00	3.00	14.10
SP - DT	3	14-Aug-19	1084	Gloeocapsa punctata	47851	1.60	4.00	4.00	33.50
SP - DT	3	14-Aug-19	1086	Calothrix sp.	23926	120.26	96.00	10.00	5026.50
SP - DT	3	14-Aug-19	1124	Petalonema alatum Berk	20935	35.52	60.00	6.00	1696.50
SP - DT	3	14-Aug-19	1131	Heteroleibeinia profunda Komarek	334960	24.22	23.00	2.00	72.30
SP - DT	3	14-Aug-19	1136	Lyngbya mucicola Lemmermann	137573	6.81	63.00	1.00	49.50
SP - DT	3	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	41870	23.23	69.00	3.20	554.90
SP - DT	3	14-Aug-19	2205	Mougeotia sp.	11963	12.18	36.00	6.00	1017.90
SP - DT	3	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	71777	103.13	28.00	14.00	1436.80
SP - DT	3	14-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	2991	8.10	69.00	10.00	2709.60
SP - DT	3	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	8972	0.44	5.00	5.00	49.10
SP - DT	3	14-Aug-19	5702	Achnanthes minutissima Kutzing	119629	9.67	19.30	4.00	80.80
SP - DT	3	14-Aug-19	5720	Cyclotella bodanica Eulenst.	2991	46.16	34.00	34.00	15434.60
SP - DT	3	14-Aug-19	5860	Diatoma vulgare Bory	23926	2.80	27.90	4.00	116.90
SP - DT	3	14-Aug-19	5873	Gomphonema minutum	2991	1.30	26.00	8.00	435.60
SP - DT	3	14-Aug-19	5882	Anomoenies vitrea Ross	5981	0.92	65.00	3.00	153.20
SP - DT	3	14-Aug-19	5910	Navicula exigua (Greg.) Muller	5981	2.14	38.00	6.00	358.10
SP - DT	3R	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	92712	34.66	119.00	2.00	373.80
SP - DT	3R	14-Aug-19	1070	Anabaenopsis sp.	17944	0.25	3.00	3.00	14.10
SP - DT	3R	14-Aug-19	1086	Calothrix sp.	29907	150.33	96.00	10.00	5026.50
SP - DT	3R	14-Aug-19	1124	Petalonema alatum Berk	17944	30.44	60.00	6.00	1696.50
SP - DT	3R	14-Aug-19	1131	Heteroleibeinia profunda Komarek	364867	26.38	23.00	2.00	72.30
SP - DT	3R	14-Aug-19	1136	Lyngbya mucicola Lemmermann	122619	6.07	63.00	1.00	49.50
SP - DT	3R	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	29907	16.60	69.00	3.20	554.90
SP - DT	3R	14-Aug-19	2205	Mougeotia sp.	26916	27.40	36.00	6.00	1017.90
SP - DT	3R	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	53833	77.35	28.00	14.00	1436.80
SP - DT	3R	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	2991	0.20	65.00	2.00	68.10
SP - DT	3R	14-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	2991	8.10	69.00	10.00	2709.60
SP - DT	3R	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	2991	0.15	5.00	5.00	49.10
SP - DT	3R	14-Aug-19	5702	Achnanthes minutissima Kutzing	146545	11.84	19.30	4.00	80.80
SP - DT	3R	14-Aug-19	5726	Eucocconeis sp.	2991	12.53	40.00	20.00	4188.80
SP - DT	3R	14-Aug-19	5860	Diatoma vulgare Bory	11963	1.40	27.90	4.00	116.90
SP - DT	3R	14-Aug-19	5873	Gomphonema minutum	5981	2.61	26.00	8.00	435.60
SP - DT	3R	14-Aug-19	5882	Anomoenies vitrea Ross	5981	1.97	35.00	6.00	329.90
SP - DT	3R	14-Aug-19	5910	Navicula exigua (Greg.) Muller	2991	1.07	38.00	6.00	358.10
SP - DT	4	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	17944	6.37	113.00	2.00	355.00
SP - DT	4	14-Aug-19	1084	Gloeocapsa punctata	47851	1.60	4.00	4.00	33.50
SP - DT	4	14-Aug-19	1086	Calothrix sp.	5981	32.26	103.00	10.00	5393.10
SP - DT	4	14-Aug-19	1124	Petalonema alatum Berk	8972	20.55	81.00	6.00	2290.20

Table K3-1. Habitat Compensation Monitoring Program Periphyton Laboratory Data, 2019.

Epilithic (EI) algal species data for CREMP 2019 (for Azimuth consulting group)

**** 1st number in species code = group 1=cyanobacteria 2=chlorophyte 5=diatoms 7=Dinoflagellates**

**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
SP - DT	4	14-Aug-19	1131	Heteroleibeinia profunda Komarek	343932	22.80	21.10	2.00	66.30
SP - DT	4	14-Aug-19	2205	Mougeotia sp.	5981	7.82	26.00	8.00	1306.90
SP - DT	4	14-Aug-19	5306	Navicula minima Grunow	44861	2.07	11.00	4.00	46.10
SP - DT	4	14-Aug-19	5311	Cymbella minuta Kutzing	20935	8.37	15.90	8.00	399.60
SP - DT	4	14-Aug-19	5507	Cyclotella stelligera Cleve and Grunow	2991	10.88	21.00	21.00	3636.80
SP - DT	4	14-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2991	2.48	88.00	6.00	829.40
SP - DT	4	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	68786	98.83	28.00	14.00	1436.80
SP - DT	4	14-Aug-19	5546	Gyrosigma sp	2991	4.04	79.00	6.60	1351.40
SP - DT	4	14-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	2991	8.34	71.00	10.00	2788.20
SP - DT	4	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	17944	0.88	5.00	5.00	49.10
SP - DT	4	14-Aug-19	5702	Achnanthes minutissima Kutzing	218322	18.30	20.00	4.00	83.80
SP - DT	4	14-Aug-19	5726	Eucocconeis sp.	5981	25.06	40.00	20.00	4188.80
SP - DT	4	14-Aug-19	5836	Encyonema silesiacum (Bleisch) D.G. Mann	17944	21.14	30.00	10.00	1178.10
SP - DT	4	14-Aug-19	5873	Gomphonema minutum	8972	4.36	29.00	8.00	485.90
SP - DT	4	14-Aug-19	5882	Anomoenies vitrea Ross	5981	1.92	34.00	6.00	320.40
SP - DT	4	14-Aug-19	5910	Navicula exigua (Greg.) Muller	2991	1.10	39.00	6.00	367.60
SP - DT	5	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	20187	7.55	119.00	2.00	373.80
SP - DT	5	14-Aug-19	1077	Pseudanabaena sp.	22430	0.28	2.50	2.50	12.30
SP - DT	5	14-Aug-19	1084	Gloeocapsa punctata	35889	1.20	4.00	4.00	33.50
SP - DT	5	14-Aug-19	1086	Calothrix sp.	13458	60.60	86.00	10.00	4502.90
SP - DT	5	14-Aug-19	1124	Petalonema alatum Berk	69534	116.00	59.00	6.00	1668.20
SP - DT	5	14-Aug-19	1131	Heteroleibeinia profunda Komarek	237762	15.69	21.00	2.00	66.00
SP - DT	5	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	38132	19.32	63.00	3.20	506.70
SP - DT	5	14-Aug-19	5306	Navicula minima Grunow	8972	0.56	9.60	5.00	62.80
SP - DT	5	14-Aug-19	5507	Cyclotella stelligera Cleve and Grunow	2243	8.16	21.00	21.00	3636.80
SP - DT	5	14-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	13458	10.65	84.00	6.00	791.70
SP - DT	5	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	35889	51.56	28.00	14.00	1436.80
SP - DT	5	14-Aug-19	5702	Achnanthes minutissima Kutzing	134582	11.28	20.00	4.00	83.80
SP - DT	5	14-Aug-19	5836	Encyonema silesiacum (Bleisch) D.G. Mann	4486	5.29	30.00	10.00	1178.10
SP - DT	5	14-Aug-19	5882	Anomoenies vitrea Ross	4486	1.52	36.00	6.00	339.30
SP - DT	5	14-Aug-19	5910	Navicula exigua (Greg.) Muller	2243	0.76	36.00	6.00	339.30
SP - ED	1	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	19739	5.52	89.00	2.00	279.60
SP - ED	1	14-Aug-19	1077	Pseudanabaena sp.	25122	0.59	3.10	3.10	23.40
SP - ED	1	14-Aug-19	1124	Petalonema alatum Berk	3589	8.63	85.00	6.00	2403.30
SP - ED	1	14-Aug-19	1131	Heteroleibeinia profunda Komarek	190210	12.92	21.60	2.00	67.90
SP - ED	1	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	129199	99.75	96.00	3.20	772.10
SP - ED	1	14-Aug-19	5509	Cyclotella ocellata Pant.	10767	3.74	9.60	9.60	347.40
SP - ED	1	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	5383	7.73	28.00	14.00	1436.80
SP - ED	1	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	3589	0.24	65.00	2.00	68.10
SP - ED	1	14-Aug-19	5523	Synedra ulna (Nitzsch) Ehrenberg	1794	4.06	240.00	6.00	2261.90
SP - ED	1	14-Aug-19	5702	Achnanthes minutissima Kutzing	98694	8.69	21.00	4.00	88.00
SP - ED	1	14-Aug-19	5726	Eucocconeis sp.	1794	7.89	42.00	20.00	4398.20
SP - ED	1	14-Aug-19	5836	Encyonema silesiacum (Bleisch) D.G. Mann	5383	6.34	30.00	10.00	1178.10
SP - ED	1	14-Aug-19	5854	Pinnularia borealis Ehrenberg	1794	3.57	76.00	10.00	1989.70
SP - ED	1	14-Aug-19	5881	Diatoma elongatum Agardh	1794	0.46	61.00	4.00	255.50
SP - ED	1	14-Aug-19	5882	Anomoenies vitrea Ross	8972	3.30	39.00	6.00	367.60
SP - ED	2	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	76263	26.11	109.00	2.00	342.40
SP - ED	2	14-Aug-19	1077	Pseudanabaena sp.	19440	0.27	2.60	2.60	13.80
SP - ED	2	14-Aug-19	1102	Gloeothece sp.	22430	0.09	2.00	2.00	4.20
SP - ED	2	14-Aug-19	1131	Heteroleibeinia profunda Komarek	113647	8.57	24.00	2.00	75.40
SP - ED	2	14-Aug-19	5306	Navicula minima Grunow	1495	0.10	10.00	5.00	65.40
SP - ED	2	14-Aug-19	5509	Cyclotella ocellata Pant.	11963	3.20	8.80	8.80	267.60
SP - ED	2	14-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	7477	6.20	88.00	6.00	829.40
SP - ED	2	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	10468	15.04	28.00	14.00	1436.80
SP - ED	2	14-Aug-19	5523	Synedra ulna (Nitzsch) Ehrenberg	1495	2.96	210.00	6.00	1979.20
SP - ED	2	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	2991	0.15	5.00	5.00	49.10
SP - ED	2	14-Aug-19	5702	Achnanthes minutissima Kutzing	101684	8.95	21.00	4.00	88.00
SP - ED	2	14-Aug-19	5768	Nitzschia linearis W. Smith	1495	1.93	77.00	8.00	1290.10
SP - ED	2	14-Aug-19	5860	Diatoma vulgare Bory	7477	1.76	25.00	6.00	235.60
SP - ED	2	14-Aug-19	5873	Gomphonema minutum	4486	2.01	26.70	8.00	447.40
SP - ED	2	14-Aug-19	5881	Diatoma elongatum Agardh	1495	0.67	61.00	5.30	448.60
SP - ED	2	14-Aug-19	5882	Anomoenies vitrea Ross	14954	5.35	38.00	6.00	358.10
SP - ED	3	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	42790	15.59	116.00	2.00	364.40
SP - ED	3	14-Aug-19	1124	Petalonema alatum Berk	5521	12.64	81.00	6.00	2290.20
SP - ED	3	14-Aug-19	1131	Heteroleibeinia profunda Komarek	27607	1.86	21.40	2.00	67.20
SP - ED	3	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	12423	10.20	96.00	3.30	821.10
SP - ED	3	14-Aug-19	2205	Mougeotia sp.	2761	4.76	61.00	6.00	1724.70
SP - ED	3	14-Aug-19	5306	Navicula minima Grunow	1380	0.06	10.00	4.10	44.00
SP - ED	3	14-Aug-19	5509	Cyclotella ocellata Pant.	8282	1.27	7.30	7.30	152.80
SP - ED	3	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	42790	61.48	28.00	14.00	1436.80
SP - ED	3	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	5521	0.35	60.00	2.00	62.80
SP - ED	3	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	4141	0.16	4.60	4.60	38.20
SP - ED	3	14-Aug-19	5702	Achnanthes minutissima Kutzing	147695	12.38	20.00	4.00	83.80

Table K3-1. Habitat Compensation Monitoring Program Periphyton Laboratory Data, 2019.

Epilithic (EI) algal species data for CREMP 2019 (for Azimuth consulting group)

**** 1st number in species code = group 1=cyanobacteria 2=chlorophyte 5=diatoms 7=Dinoflagellates**

**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
SP - ED	3	14-Aug-19	5726	Eucocconeis sp.	1380	5.78	40.00	20.00	4188.80
SP - ED	3	14-Aug-19	5750	Navicula subtilissima Cleve	2761	2.59	56.00	8.00	938.30
SP - ED	3	14-Aug-19	5768	Nitzschia linearis W. Smith	1380	1.64	71.00	8.00	1189.60
SP - ED	3	14-Aug-19	5860	Diatoma vulgare Bory	2761	0.34	29.40	4.00	123.20
SP - ED	3	14-Aug-19	5873	Gomphonema minutum	5521	2.41	26.00	8.00	435.60
SP - ED	3	14-Aug-19	5882	Anomoenies vitrea Ross	4141	1.37	35.00	6.00	329.90
SP - ED	3	14-Aug-19	5910	Navicula exigua (Greg.) Muller	13803	4.94	38.00	6.00	358.10
SP - ED	4	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	52453	22.41	136.00	2.00	427.30
SP - ED	4	14-Aug-19	1084	Gloeocapsa punctata	35889	1.20	4.00	4.00	33.50
SP - ED	4	14-Aug-19	1102	Gloeothece sp.	82820	0.40	2.10	2.10	4.80
SP - ED	4	14-Aug-19	1124	Petalonema alatum Berk	9662	23.22	85.00	6.00	2403.30
SP - ED	4	14-Aug-19	1131	Heteroleibeinia profunda Komarek	67636	4.17	19.60	2.00	61.60
SP - ED	4	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	37269	22.79	81.00	3.10	611.40
SP - ED	4	14-Aug-19	2205	Mougeotia sp.	6902	23.85	44.00	10.00	3455.80
SP - ED	4	14-Aug-19	5509	Cyclotella ocellata Pant.	2761	0.79	9.00	9.00	286.30
SP - ED	4	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	24846	35.70	28.00	14.00	1436.80
SP - ED	4	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	13803	0.91	63.00	2.00	66.00
SP - ED	4	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	9662	0.45	4.90	4.90	46.20
SP - ED	4	14-Aug-19	5702	Achnanthes minutissima Kutzing	153217	13.48	21.00	4.00	88.00
SP - ED	4	14-Aug-19	5857	Nitzschia filiformis (W. Smith) Hustedt	2761	0.86	33.00	6.00	311.00
SP - ED	4	14-Aug-19	5873	Gomphonema minutum	1380	0.67	29.00	8.00	485.90
SP - ED	4	14-Aug-19	5882	Anomoenies vitrea Ross	6902	2.47	38.00	6.00	358.10
SP - ED	4	14-Aug-19	5884	Gomphonema angustum Agardh	4141	4.44	41.00	10.00	1073.40
SP - ED	4	14-Aug-19	5910	Navicula exigua (Greg.) Muller	4141	1.60	41.00	6.00	386.40
SP - ED	4R	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	77299	31.33	129.00	2.00	405.30
SP - ED	4R	14-Aug-19	1084	Gloeocapsa punctata	22085	0.74	4.00	4.00	33.50
SP - ED	4R	14-Aug-19	1102	Gloeothece sp.	27607	0.13	2.10	2.10	4.80
SP - ED	4R	14-Aug-19	1124	Petalonema alatum Berk	5521	13.27	85.00	6.00	2403.30
SP - ED	4R	14-Aug-19	1131	Heteroleibeinia profunda Komarek	84200	5.56	21.00	2.00	66.00
SP - ED	4R	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	26226	17.82	90.00	3.10	679.30
SP - ED	4R	14-Aug-19	2205	Mougeotia sp.	4141	14.31	44.00	10.00	3455.80
SP - ED	4R	14-Aug-19	5306	Navicula minima Grunow	2761	0.13	10.00	4.30	48.40
SP - ED	4R	14-Aug-19	5507	Cyclotella stelligera Cleve and Grunow	1380	5.77	22.00	22.00	4181.50
SP - ED	4R	14-Aug-19	5509	Cyclotella ocellata Pant.	1380	0.40	9.00	9.00	286.30
SP - ED	4R	14-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	2761	2.29	88.00	6.00	829.40
SP - ED	4R	14-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	31748	45.61	28.00	14.00	1436.80
SP - ED	4R	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	8282	0.53	61.00	2.00	63.90
SP - ED	4R	14-Aug-19	5551	Cyclotella michiganiana Skvortzow	5521	0.26	4.90	4.90	46.20
SP - ED	4R	14-Aug-19	5702	Achnanthes minutissima Kutzing	161499	14.21	21.00	4.00	88.00
SP - ED	4R	14-Aug-19	5873	Gomphonema minutum	1380	0.67	29.00	8.00	485.90
SP - ED	4R	14-Aug-19	5882	Anomoenies vitrea Ross	12423	4.45	38.00	6.00	358.10
SP - ED	4R	14-Aug-19	5884	Gomphonema angustum Agardh	1380	1.48	41.00	10.00	1073.40
SP - ED	4R	14-Aug-19	5910	Navicula exigua (Greg.) Muller	1380	0.53	41.00	6.00	386.40
SP - ED	5	14-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	23466	8.18	111.00	2.00	348.70
SP - ED	5	14-Aug-19	1084	Gloeocapsa punctata	95243	3.19	4.00	4.00	33.50
SP - ED	5	14-Aug-19	1102	Gloeothece sp.	132512	0.64	2.10	2.10	4.80
SP - ED	5	14-Aug-19	1124	Petalonema alatum Berk	1380	1.91	49.00	6.00	1385.40
SP - ED	5	14-Aug-19	1131	Heteroleibeinia profunda Komarek	138033	9.37	21.60	2.00	67.90
SP - ED	5	14-Aug-19	1239	Homoeothrix varians Komarek & Kalina	8282	5.88	94.00	3.10	709.50
SP - ED	5	14-Aug-19	5509	Cyclotella ocellata Pant.	1380	0.40	9.00	9.00	286.30
SP - ED	5	14-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	6902	0.48	66.00	2.00	69.10
SP - ED	5	14-Aug-19	5702	Achnanthes minutissima Kutzing	66256	5.00	18.00	4.00	75.40
SP - ED	5	14-Aug-19	5720	Cyclotella bodanica Eulenst.	1380	19.48	33.00	33.00	14112.40
SP - ED	5	14-Aug-19	5726	Eucocconeis sp.	1380	5.78	40.00	20.00	4188.80
SP - ED	5	14-Aug-19	5768	Nitzschia linearis W. Smith	1380	1.78	77.00	8.00	1290.10
SP - ED	5	14-Aug-19	5860	Diatoma vulgare Bory	6902	0.75	26.00	4.00	108.90
SP - ED	5	14-Aug-19	5910	Navicula exigua (Greg.) Muller	4141	1.52	39.00	6.00	367.60
TPE - BGN	1	9-Aug-19	1086	Calothrix sp.	449	1.95	83.00	10.00	4345.90
TPE - BGN	1	9-Aug-19	1122	Phormidium autumnale Agardh	1346	5.56	146.00	6.00	4128.10
TPE - BGN	1	9-Aug-19	1131	Heteroleibeinia profunda Komarek	13907	0.94	21.60	2.00	67.90
TPE - BGN	1	9-Aug-19	1223	Chamaesiphon incrustans Smith	7178	0.23	6.80	3.00	32.00
TPE - BGN	1	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	1794	2.39	26.00	14.00	1334.10
TPE - BGN	1	9-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	1346	0.08	60.00	2.00	62.80
TPE - BGN	1	9-Aug-19	5546	Gyrosigma sp	449	0.45	71.00	6.00	1003.70
TPE - BGN	1	9-Aug-19	5702	Achnanthes minutissima Kutzing	45309	3.80	20.00	4.00	83.80
TPE - BGN	1	9-Aug-19	5874	Nitzschia palea (Kutzing) W. Smith	449	0.58	77.00	8.00	1290.10
TPE - BGN	1	9-Aug-19	5882	Anomoenies vitrea Ross	1346	0.46	36.00	6.00	339.30
TPE - BGN	2	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	5024	1.37	136.00	1.60	273.40
TPE - BGN	2	9-Aug-19	1122	Phormidium autumnale Agardh	2153	7.06	116.00	6.00	3279.80
TPE - BGN	2	9-Aug-19	1131	Heteroleibeinia profunda Komarek	5742	0.42	23.00	2.00	72.30
TPE - BGN	2	9-Aug-19	4388	Dinobryon sertularia Ehrenberg	2153	0.49	12.00	6.00	226.20
TPE - BGN	2	9-Aug-19	5306	Navicula minima Grunow	718	0.04	12.00	4.00	50.30
TPE - BGN	2	9-Aug-19	5509	Cyclotella ocellata Pant.	1077	0.37	9.60	9.60	347.40

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Epilithic (EI) algal species data for CREMP 2019 (for Azimuth consulting group)

**** 1st number in species code = group 1=cyanobacteria 2=chlorophyte 5=diatoms 7=Dinoflagellates**

**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
TPE - BGN	2	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	359	0.02	5.00	5.00	49.10
TPE - BGN	2	9-Aug-19	5702	Achnanthes minutissima Kutzing	34453	2.74	19.00	4.00	79.60
TPE - BGN	2	9-Aug-19	5873	Gomphonema minutum	1436	0.70	29.00	8.00	485.90
TPE - BGN	2	9-Aug-19	5874	Nitzschia palea (Kutzing) W. Smith	1436	1.85	77.00	8.00	1290.10
TPE - BGN	2	9-Aug-19	5882	Anomoenies vitrea Ross	359	0.12	34.60	6.00	326.10
TPE - BGN	2R	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	3589	0.98	136.00	1.60	273.40
TPE - BGN	2R	9-Aug-19	1122	Phormidium autumnale Agardh	2153	7.06	116.00	6.00	3279.80
TPE - BGN	2R	9-Aug-19	1131	Heteroleibeinia profunda Komarek	11125	0.80	23.00	2.00	72.30
TPE - BGN	2R	9-Aug-19	5306	Navicula minima Grunow	1794	0.09	12.00	4.00	50.30
TPE - BGN	2R	9-Aug-19	5311	Cymbella minuta Kutzing	359	0.14	16.00	8.00	402.10
TPE - BGN	2R	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	1436	2.06	28.00	14.00	1436.80
TPE - BGN	2R	9-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	718	3.37	83.00	12.00	4693.50
TPE - BGN	2R	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	359	0.02	5.00	5.00	49.10
TPE - BGN	2R	9-Aug-19	5702	Achnanthes minutissima Kutzing	38042	3.03	19.00	4.00	79.60
TPE - BGN	2R	9-Aug-19	5873	Gomphonema minutum	718	0.35	29.00	8.00	485.90
TPE - BGN	2R	9-Aug-19	5874	Nitzschia palea (Kutzing) W. Smith	1794	2.31	77.00	8.00	1290.10
TPE - BGN	3	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	21533	9.09	210.00	1.60	422.20
TPE - BGN	3	9-Aug-19	1084	Gloeocapsa punctata	7178	0.24	4.00	4.00	33.50
TPE - BGN	3	9-Aug-19	1086	Calothrix sp.	4037	19.87	94.00	10.00	4921.80
TPE - BGN	3	9-Aug-19	1124	Petalonema alatum Berk	2692	7.15	94.00	6.00	2657.80
TPE - BGN	3	9-Aug-19	1131	Heteroleibeinia profunda Komarek	5383	0.51	30.00	2.00	94.20
TPE - BGN	3	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	2243	2.99	26.00	14.00	1334.10
TPE - BGN	3	9-Aug-19	5702	Achnanthes minutissima Kutzing	44412	3.63	19.50	4.00	81.70
TPE - BGN	3	9-Aug-19	5726	Eucocconeis sp.	897	3.85	41.00	20.00	4293.50
TPE - BGN	3	9-Aug-19	5873	Gomphonema minutum	449	0.22	29.00	8.00	485.90
TPE - BGN	3	9-Aug-19	5874	Nitzschia palea (Kutzing) W. Smith	1794	4.28	91.00	10.00	2382.40
TPE - BGN	3	9-Aug-19	5882	Anomoenies vitrea Ross	1346	0.44	35.00	6.00	329.90
TPE - BGN	4	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	1077	0.34	159.00	1.60	319.70
TPE - BGN	4	9-Aug-19	1086	Calothrix sp.	1436	6.46	86.00	10.00	4502.90
TPE - BGN	4	9-Aug-19	1122	Phormidium autumnale Agardh	1077	3.07	101.00	6.00	2855.70
TPE - BGN	4	9-Aug-19	1124	Petalonema alatum Berk	1077	2.89	86.00	6.30	2680.80
TPE - BGN	4	9-Aug-19	1131	Heteroleibeinia profunda Komarek	20098	1.41	22.30	2.00	70.10
TPE - BGN	4	9-Aug-19	4388	Dinobryon sertularia Ehrenberg	2153	0.49	12.00	6.00	226.20
TPE - BGN	4	9-Aug-19	5306	Navicula minima Grunow	718	0.03	10.50	4.00	44.00
TPE - BGN	4	9-Aug-19	5311	Cymbella minuta Kutzing	1077	0.39	14.30	8.00	359.40
TPE - BGN	4	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	3589	5.16	28.00	14.00	1436.80
TPE - BGN	4	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	1794	0.09	5.00	5.00	49.10
TPE - BGN	4	9-Aug-19	5702	Achnanthes minutissima Kutzing	33376	2.60	18.60	4.00	77.90
TPE - BGN	4	9-Aug-19	5875	Cocconies disculus Schum.	359	0.94	31.00	18.00	2629.50
TPE - BGN	4	9-Aug-19	5882	Anomoenies vitrea Ross	1436	0.50	37.00	6.00	348.70
TPE - BGN	5	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	3948	0.94	119.00	1.60	239.30
TPE - BGN	5	9-Aug-19	1084	Gloeocapsa punctata	11125	0.37	4.00	4.00	33.50
TPE - BGN	5	9-Aug-19	1086	Calothrix sp.	359	1.60	85.00	10.00	4450.60
TPE - BGN	5	9-Aug-19	1131	Heteroleibeinia profunda Komarek	9331	0.62	21.30	2.00	66.90
TPE - BGN	5	9-Aug-19	5311	Cymbella minuta Kutzing	359	0.14	16.00	8.00	402.10
TPE - BGN	5	9-Aug-19	5509	Cyclotella ocellata Pant.	359	0.11	9.10	9.10	295.90
TPE - BGN	5	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	1077	1.49	27.00	14.00	1385.40
TPE - BGN	5	9-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	718	2.11	75.00	10.00	2945.20
TPE - BGN	5	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	1436	0.07	5.00	5.00	49.10
TPE - BGN	5	9-Aug-19	5702	Achnanthes minutissima Kutzing	45220	3.52	18.60	4.00	77.90
TPE - BGN	5	9-Aug-19	5873	Gomphonema minutum	1436	0.70	29.00	8.00	485.90
TPE - BGS	1	10-Aug-19	1077	Pseudanabaena sp.	2153	0.02	2.40	2.40	10.90
TPE - BGS	1	10-Aug-19	1131	Heteroleibeinia profunda Komarek	5742	0.53	29.30	2.00	92.00
TPE - BGS	1	10-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	718	0.05	71.00	2.00	74.40
TPE - BGS	1	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	359	0.02	5.20	5.20	55.20
TPE - BGS	1	10-Aug-19	5702	Achnanthes minutissima Kutzing	36247	2.73	18.00	4.00	75.40
TPE - BGS	1	10-Aug-19	5726	Eucocconeis sp.	359	2.16	40.00	24.00	6031.90
TPE - BGS	1	10-Aug-19	5767	Nitzschia fonticola Grunow	1077	0.08	18.00	4.00	75.40
TPE - BGS	1	10-Aug-19	5860	Diatoma vulgare Bory	3230	0.79	26.00	6.00	245.00
TPE - BGS	1	10-Aug-19	5910	Navicula exigua (Greg.) Muller	2512	0.57	24.00	6.00	226.20
TPE - BGS	2	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	718	0.46	316.00	1.60	635.40
TPE - BGS	2	10-Aug-19	1084	Gloeocapsa punctata	7537	0.25	4.00	4.00	33.50
TPE - BGS	2	10-Aug-19	1131	Heteroleibeinia profunda Komarek	9331	0.72	24.60	2.00	77.30
TPE - BGS	2	10-Aug-19	4388	Dinobryon sertularia Ehrenberg	3230	0.73	12.00	6.00	226.20
TPE - BGS	2	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	4307	6.19	28.00	14.00	1436.80
TPE - BGS	2	10-Aug-19	5518	Synedra acus Kutzing	359	0.04	110.00	2.00	115.20
TPE - BGS	2	10-Aug-19	5546	Gyrosigma sp	359	0.36	71.00	6.00	1003.70
TPE - BGS	2	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	3589	0.25	5.60	5.60	69.00
TPE - BGS	2	10-Aug-19	5702	Achnanthes minutissima Kutzing	34812	3.06	21.00	4.00	88.00
TPE - BGS	2	10-Aug-19	5726	Eucocconeis sp.	718	3.01	40.00	20.00	4188.80
TPE - BGS	2	10-Aug-19	5860	Diatoma vulgare Bory	4307	1.03	25.50	6.00	240.30
TPE - BGS	2	10-Aug-19	5882	Anomoenies vitrea Ross	1794	0.64	38.00	6.00	358.10
TPE - BGS	2	10-Aug-19	5916	Fragilaria capucina Grunow	359	0.10	65.00	4.00	272.30

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**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
TPE - BGS	3	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	1077	0.43	200.00	1.60	402.10
TPE - BGS	3	9-Aug-19	1077	Pseudanabaena sp.	3589	0.08	3.10	3.10	23.40
TPE - BGS	3	9-Aug-19	1131	Heteroleibeinia profunda Komarek	2153	0.18	25.90	2.00	81.40
TPE - BGS	3	9-Aug-19	4388	Dinobryon sertularia Ehrenberg	2153	0.49	12.00	6.00	226.20
TPE - BGS	3	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	359	0.52	28.00	14.00	1436.80
TPE - BGS	3	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	2871	0.14	5.00	5.00	49.10
TPE - BGS	3	9-Aug-19	5702	Achnanthes minutissima Kutzing	30146	2.53	20.00	4.00	83.80
TPE - BGS	3	9-Aug-19	5860	Diatoma vulgare Bory	2153	0.52	25.50	6.00	240.30
TPE - BGS	3	9-Aug-19	5882	Anomoenies vitrea Ross	1077	0.39	38.00	6.00	358.10
TPE - BGS	4	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	1077	0.32	149.00	1.60	299.60
TPE - BGS	4	9-Aug-19	1086	Calothrix sp.	718	3.72	99.00	10.00	5183.60
TPE - BGS	4	9-Aug-19	1124	Petalonema alatum Berk	1077	2.83	93.00	6.00	2629.50
TPE - BGS	4	9-Aug-19	1131	Heteroleibeinia profunda Komarek	16150	1.37	27.00	2.00	84.80
TPE - BGS	4	9-Aug-19	2205	Mougeotia sp.	4307	5.84	27.00	8.00	1357.20
TPE - BGS	4	9-Aug-19	4388	Dinobryon sertularia Ehrenberg	1436	0.32	12.00	6.00	226.20
TPE - BGS	4	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	1077	1.44	26.00	14.00	1334.10
TPE - BGS	4	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	5024	0.25	5.00	5.00	49.10
TPE - BGS	4	9-Aug-19	5702	Achnanthes minutissima Kutzing	36247	2.82	18.60	4.00	77.90
TPE - BGS	4	9-Aug-19	5873	Gomphonema minutum	359	0.16	25.90	8.00	434.00
TPE - BGS	4	9-Aug-19	5882	Anomoenies vitrea Ross	1436	0.50	37.00	6.00	348.70
TPE - BGS	5	9-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	24524	6.85	139.00	1.60	279.50
TPE - BGS	5	9-Aug-19	1084	Gloeocapsa punctata	9570	0.32	4.00	4.00	33.50
TPE - BGS	5	9-Aug-19	1086	Calothrix sp.	1196	6.64	106.00	10.00	5550.10
TPE - BGS	5	9-Aug-19	1124	Petalonema alatum Berk	2991	7.95	94.00	6.00	2657.80
TPE - BGS	5	9-Aug-19	1131	Heteroleibeinia profunda Komarek	17944	1.35	24.00	2.00	75.40
TPE - BGS	5	9-Aug-19	2205	Mougeotia sp.	4785	11.06	46.00	8.00	2312.20
TPE - BGS	5	9-Aug-19	2231	Bulbochaete sp.	30505	16.91	19.60	6.00	554.20
TPE - BGS	5	9-Aug-19	4388	Dinobryon sertularia Ehrenberg	3589	0.81	12.00	6.00	226.20
TPE - BGS	5	9-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	598	0.80	26.00	14.00	1334.10
TPE - BGS	5	9-Aug-19	5547	Frustulia rhomboides (Ehrenberg) de Toni	598	3.68	80.00	14.00	6157.50
TPE - BGS	5	9-Aug-19	5551	Cyclotella michiganiana Skvortzow	3589	0.18	5.00	5.00	49.10
TPE - BGS	5	9-Aug-19	5702	Achnanthes minutissima Kutzing	61609	5.16	20.00	4.00	83.80
TPE - BGS	5	9-Aug-19	5873	Gomphonema minutum	1196	0.58	29.00	8.00	485.90
TPE - BGS	5	9-Aug-19	5882	Anomoenies vitrea Ross	2991	1.01	36.00	6.00	339.30
TPE - G	1	10-Aug-19	1014	Chroococcus limneticus Lemmermann	3589	0.13	4.10	4.10	36.10
TPE - G	1	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	25122	15.78	200.00	2.00	628.30
TPE - G	1	10-Aug-19	1084	Gloeocapsa punctata	28711	0.96	4.00	4.00	33.50
TPE - G	1	10-Aug-19	1086	Calothrix sp.	48450	256.22	101.00	10.00	5288.30
TPE - G	1	10-Aug-19	1131	Heteroleibeinia profunda Komarek	227893	22.40	31.30	2.00	98.30
TPE - G	1	10-Aug-19	2205	Mougeotia sp.	3589	12.12	43.00	10.00	3377.20
TPE - G	1	10-Aug-19	4388	Dinobryon sertularia Ehrenberg	16150	3.65	12.00	6.00	226.20
TPE - G	1	10-Aug-19	5507	Cyclotella stelligera Cleve and Grunow	1794	6.53	21.00	21.00	3636.80
TPE - G	1	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	1794	2.58	28.00	14.00	1436.80
TPE - G	1	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	8972	0.44	5.00	5.00	49.10
TPE - G	1	10-Aug-19	5702	Achnanthes minutissima Kutzing	10767	0.95	21.00	4.00	88.00
TPE - G	1	10-Aug-19	5860	Diatoma vulgare Bory	5383	1.42	28.00	6.00	263.90
TPE - G	1	10-Aug-19	5873	Gomphonema minutum	3589	1.62	27.00	8.00	452.40
TPE - G	1	10-Aug-19	5910	Navicula exigua (Greg.) Muller	1794	0.61	36.00	6.00	339.30
TPE - G	1	10-Aug-19	5916	Fragilaria capucina Grunow	3589	0.84	56.00	4.00	234.60
TPE - G	2	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	91965	48.82	169.00	2.00	530.90
TPE - G	2	10-Aug-19	1086	Calothrix sp.	103180	175.83	82.00	6.30	1704.10
TPE - G	2	10-Aug-19	1102	Gloeothece sp.	69534	0.29	2.00	2.00	4.20
TPE - G	2	10-Aug-19	1131	Heteroleibeinia profunda Komarek	224304	14.80	21.00	2.00	66.00
TPE - G	2	10-Aug-19	2205	Mougeotia sp.	13458	72.93	69.00	10.00	5419.20
TPE - G	2	10-Aug-19	5507	Cyclotella stelligera Cleve and Grunow	2243	9.38	22.00	22.00	4181.50
TPE - G	2	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	35889	49.54	26.90	14.00	1380.30
TPE - G	2	10-Aug-19	5519	Synedra acus v. radians (Kutzing) Hustedt	2243	0.15	64.00	2.00	67.00
TPE - G	2	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	17944	0.88	5.00	5.00	49.10
TPE - G	2	10-Aug-19	5702	Achnanthes minutissima Kutzing	22430	1.88	20.00	4.00	83.80
TPE - G	2	10-Aug-19	5720	Cyclotella bodanica Eulenst.	2243	34.62	34.00	34.00	15434.60
TPE - G	2	10-Aug-19	5882	Anomoenies vitrea Ross	2243	0.78	37.00	6.00	348.70
TPE - G	2	10-Aug-19	5910	Navicula exigua (Greg.) Muller	2243	0.72	34.00	6.00	320.40
TPE - G	3	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	74768	34.30	146.00	2.00	458.70
TPE - G	3	10-Aug-19	1084	Gloeocapsa punctata	92712	3.11	4.00	4.00	33.50
TPE - G	3	10-Aug-19	1086	Calothrix sp.	23926	95.26	96.00	8.90	3981.50
TPE - G	3	10-Aug-19	1102	Gloeothece sp.	77759	0.33	2.00	2.00	4.20
TPE - G	3	10-Aug-19	1131	Heteroleibeinia profunda Komarek	299072	21.23	22.60	2.00	71.00
TPE - G	3	10-Aug-19	2205	Mougeotia sp.	2991	11.98	51.00	10.00	4005.50
TPE - G	3	10-Aug-19	4388	Dinobryon sertularia Ehrenberg	29907	6.77	12.00	6.00	226.20
TPE - G	3	10-Aug-19	5513	Tabellaria fenestrata (Lyngbye) Kutzing	5981	4.62	82.00	6.00	772.80
TPE - G	3	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	47851	63.84	26.00	14.00	1334.10
TPE - G	3	10-Aug-19	5702	Achnanthes minutissima Kutzing	47851	3.69	18.40	4.00	77.10
TPE - G	3	10-Aug-19	5726	Eucocconeis sp.	2991	12.53	40.00	20.00	4188.80

Table K3-1. Habitat Compensation Monitoring Program Periphyton Laboratory Data, 2019.

Epilithic (EI) algal species data for CREMP 2019 (for Azimuth consulting group)

**** 1st number in species code = group 1=cyanobacteria 2=chlorophyte 5=diatoms 7=Dinoflagellates**

**** total daily biomass is sum of all species on a given date**

**********R specifies a replicate count for QA/QC**

Location	Station	Date	Species code	Species name	density cells/cm^2	biomass µg/cm^2	length µ	width µ	cell volume µ^3
TPE - G	3	10-Aug-19	5728	Epithemia argus Kutzing	2991	4.96	44.00	12.00	1658.80
TPE - G	3	10-Aug-19	5857	Nitzschia filiformis (W. Smith) Hustedt	8972	1.20	53.00	3.10	133.30
TPE - G	3	10-Aug-19	5882	Anomoenies vitrea Ross	2991	1.07	38.00	6.00	358.10
TPE - G	4	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	149536	93.95	200.00	2.00	628.30
TPE - G	4	10-Aug-19	1084	Gloeocapsa punctata	239257	8.02	4.00	4.00	33.50
TPE - G	4	10-Aug-19	1086	Calothrix sp.	71777	218.88	91.00	8.00	3049.40
TPE - G	4	10-Aug-19	1102	Gloeothece sp.	107666	0.45	2.00	2.00	4.20
TPE - G	4	10-Aug-19	1131	Heteroleibeinia profunda Komarek	340942	22.50	21.00	2.00	66.00
TPE - G	4	10-Aug-19	1223	Chamaesiphon incrustans Smith	44861	1.37	6.50	3.00	30.60
TPE - G	4	10-Aug-19	2205	Mougeotia sp.	35889	93.02	33.00	10.00	2591.80
TPE - G	4	10-Aug-19	5306	Navicula minima Grunow	8972	1.18	14.00	6.00	131.90
TPE - G	4	10-Aug-19	5509	Cyclotella ocellata Pant.	5981	2.14	9.70	9.70	358.40
TPE - G	4	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	71777	103.13	28.00	14.00	1436.80
TPE - G	4	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	5981	0.29	5.00	5.00	49.10
TPE - G	4	10-Aug-19	5702	Achnanthes minutissima Kutzing	77759	5.89	18.10	4.00	75.80
TPE - G	4	10-Aug-19	5720	Cyclotella bodanica Eulenst.	2991	50.35	35.00	35.00	16837.00
TPE - G	4	10-Aug-19	5857	Nitzschia filiformis (W. Smith) Hustedt	14954	2.44	39.00	4.00	163.40
TPE - G	4	10-Aug-19	5873	Gomphonema minutum	2991	1.35	27.00	8.00	452.40
TPE - G	4	10-Aug-19	5882	Anomoenies vitrea Ross	14954	5.21	37.00	6.00	348.70
TPE - G	4	10-Aug-19	5910	Navicula exigua (Greg.) Muller	2991	0.99	35.00	6.00	329.90
TPE - G	5	10-Aug-19	1057	Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek	394775	262.92	212.00	2.00	666.00
TPE - G	5	10-Aug-19	1084	Gloeocapsa punctata	261987	8.78	4.00	4.00	33.50
TPE - G	5	10-Aug-19	1086	Calothrix sp.	78955	376.20	91.00	10.00	4764.70
TPE - G	5	10-Aug-19	1102	Gloeothece sp.	57422	0.24	2.00	2.00	4.20
TPE - G	5	10-Aug-19	1131	Heteroleibeinia profunda Komarek	362475	22.22	19.50	2.00	61.30
TPE - G	5	10-Aug-19	1223	Chamaesiphon incrustans Smith	17944	0.67	6.50	3.30	37.10
TPE - G	5	10-Aug-19	2205	Mougeotia sp.	21533	99.78	59.00	10.00	4633.80
TPE - G	5	10-Aug-19	2216	Zygnema sp.	7178	24.80	44.00	10.00	3455.80
TPE - G	5	10-Aug-19	4388	Dinobryon sertularia Ehrenberg	21533	4.87	12.00	6.00	226.20
TPE - G	5	10-Aug-19	5306	Navicula minima Grunow	10767	0.82	11.60	5.00	75.90
TPE - G	5	10-Aug-19	5514	Tabellaria flocculosa (Roth) Kutzing	78955	113.44	28.00	14.00	1436.80
TPE - G	5	10-Aug-19	5551	Cyclotella michiganiana Skvortzow	10767	0.36	4.40	4.40	33.50
TPE - G	5	10-Aug-19	5702	Achnanthes minutissima Kutzing	21533	1.63	18.10	4.00	75.80
TPE - G	5	10-Aug-19	5857	Nitzschia filiformis (W. Smith) Hustedt	7178	1.17	39.00	4.00	163.40
TPE - G	5	10-Aug-19	5882	Anomoenies vitrea Ross	3589	1.22	36.00	6.00	339.30

APPENDIX K4
PRESENCE /ABSENCE MATRIX OF PERIPHYTON SPECIES

Table K4-1. Presence (+) /absence (-) matrix of periphyton species, 2019.

Taxon Code	Taxon Name	Cell Measurements			Second Portage Lake												Third Portage Lake - East Basin					
					Drilltrail Arm (Reference Area) SP-DT						East Dike SP-ED						Bay-Goose Dike - North Section TPE-BGN					
		length (μ)	width (μ)	volume (μ^3)	1	2	3	3R	4	5	1	2	3	4	4R	5	1	2	2R	3	4	5
	Cyanobacteria																					
1014	*Chroococcus limneticus Lemmermann*	4.1	4.1	36.1	+	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+
1057	*Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek*	145.6	1.9	389.3	-	-	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1070	*Anabaenopsis sp.*	3.0	3.0	14.1	-	-	-	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-
1077	*Pseudanabaena sp.*	2.7	2.7	16.8	+	-	+	-	+	+	-	-	-	+	+	+	-	-	-	+	-	+
1084	*Gloeocapsa punctata*	4.0	4.0	33.5	+	+	+	+	+	+	-	-	-	-	-	-	+	-	-	+	+	+
1086	*Calothrix sp.*	92.2	9.5	4439.5	-	-	-	-	-	-	-	+	-	+	+	+	-	-	-	-	-	-
1102	*Gloeothece sp.*	2.0	2.0	4.4	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	-	+	-
1122	*Phormidium autumnale Agardh*	119.8	6.0	3385.9	+	+	+	+	+	+	+	-	+	+	+	+	-	-	-	+	+	-
1124	*Petalonema alatum Berk*	77.3	6.0	2203.2	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1131	*Heteroleibeinia profunda Komarek*	23.1	2.0	72.5	+	+	+	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1136	*Lyngbya mucicola Lemmermann*	59.5	1.0	46.8	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
1223	*Chamaesiphon incrustans Smith*	6.6	3.1	33.2	+	+	+	+	-	+	+	-	+	+	+	+	-	-	-	-	-	-
1239	*Homoeothrix varians Komarek & Kalina*	82.3	3.2	653.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chlorophyte																					
2205	*Mougeotia sp.*	46.9	9.2	3538.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2216	*Zygnema sp.*	44.0	10.0	3455.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2231	*Bulbochaete sp.*	19.6	6.0	554.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Chrysophyte																					
4388	*Dinobryon sertularia Ehrenberg*	12.0	6.0	226.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Diatom																					
5306	*Navicula minima Grunow*	11.1	4.5	61.9	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	+	+
5311	*Cymbella minuta Kutzing*	15.6	8.0	391.1	-	-	-	-	+	+	-	-	-	-	+	-	-	-	-	-	-	-
5507	*Cyclotella stelligera Cleve and Grunow*	21.4	21.4	3854.7	-	-	-	-	-	-	+	+	+	+	+	+	-	+	-	-	-	+
5509	*Cyclotella ocellata Pant.*	9.0	9.0	292.0	+	-	-	-	+	+	-	+	-	-	+	-	-	-	-	-	-	-
5513	*Tabellaria fenestrata (Lyngbye) Kutzing*	85.3	6.0	804.3	+	+	+	+	+	+	+	+	+	+	+	-	+	-	+	+	+	+
5514	*Tabellaria flocculosa (Roth) Kutzing*	27.6	14.1	1434.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5518	*Synedra acus Kutzing*	110.0	2.0	115.2	+	+	-	+	-	-	+	-	+	+	+	+	+	-	-	-	-	-
5519	*Synedra acus v. radians (Kutzing) Hustedt*	63.1	2.0	66.1	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
5523	*Synedra ulna (Nitzsch) Ehrenberg*	225.0	6.0	2120.6	-	-	-	-	+	-	-	-	-	-	-	-	+	-	-	-	-	-
5546	*Gyrosigma sp*	73.7	6.2	1119.6	-	-	+	+	+	-	-	-	-	-	-	-	-	-	+	-	-	+
5547	*Frustulia rhomboides (Ehrenberg) de Toni*	74.5	11.0	3667.3	-	-	+	+	+	-	-	+	+	+	+	-	-	+	+	-	+	+
5551	*Cyclotella michiganiana Skvortzow*	5.0	5.0	48.8	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
5702	*Achnanthes minutissima Kutzing*	19.6	4.0	82.2	-	-	+	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-
5720	*Cyclotella bodanica Eulenst.*	34.0	34.0	15454.7	-	+	-	+	+	-	+	-	+	-	-	+	-	-	-	+	-	-
5726	*Eucocconeis sp.*	40.3	20.4	4404.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5728	*Epithemia argus Kutzing*	44.0	12.0	1658.8	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-
5750	*Navicula subtilissima Cleve*	56.0	8.0	938.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5767	*Nitzschia fonticola Grunow*	18.0	4.0	75.4	-	-	-	-	-	-	-	+	+	-	-	+	-	-	-	-	-	-
5768	*Nitzschia linearis W. Smith*	75.0	8.0	1256.6	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5820	*Eunotia arcus Ehrenberg*	40.0	12.0	1508.0	-	+	-	-	+	+	+	-	-	-	-	-	-	-	-	-	-	-
5836	*Encyonema silesiacum (Bleisch) D.G. Mann*	30.0	10.0	1178.1	+	-	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-
5854	*Pinnularia borealis Ehrenberg*	70.5	10.0	1845.7	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-	-	-	-
5857	*Nitzschia filiformis (W. Smith) Hustedt*	41.0	4.3	192.8	+	-	+	+	-	-	-	+	+	-	-	+	-	-	-	-	-	-
5860	*Diatoma vulgare Bory*	27.2	5.5	234.8	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5870	*Navicula radiosa Kutzing*	71.0	10.0	1858.8	+	-	+	+	+	-	-	+	+	+	+	-	-	+	+	+	-	+
5873	*Gomphonema minutum*	27.7	8.0	463.5	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
5874	*Nitzschia palea (Kutzing) W. Smith*	80.5	8.5	1563.2	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-
5875	*Cocconies disculus Schum.*	30.5	18.0	2587.1	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-	-	-
5881	*Diatoma elongatum Agardh*	61.0	4.7	352.1	+	-	+	+	+	+	+	+	+	+	+	-	+	+	-	+	+	-
5882	*Anomoenies vitrea Ross*	37.9	5.9	336.2	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-	-	-	-
5884	*Gomphonema angustum Agardh*	41.0	10.0	1073.4	-	+	+	+	+	+	-	-	+	+	+	+	-	-	-	-	-	-
5910	*Navicula exigua (Greg.) Muller*	36.8	6.0	347.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5916	*Fragilaria capucina Grunow*	60.5	4.0	253.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Total Richness				**17**	**14**	**17**	**17**	**18**	**14**	**15**	**15**	**16**	**16**	**17**	**14**	**10**	**9**	**10**	**11**	**11**	**11**

Table K4-1. Presence (+) /absence (-) matrix of periphyton species, 2019.

Taxon Code	Taxon Name	Cell Measurements			Third Portage Lake - East Basin									
					Reference Area TPE-G					Bay-Goose Dike - South Section TPE-BGS				
		length (μ)	width (μ)	volume (μ^3)	1	2	3	4	5	1	2	3	4	5
	Cyanobacteria													
1014	*Chroococcus limneticus Lemmermann*	4.1	4.1	36.1	-	+	+	+	+	+	+	+	+	+
1057	*Leptolyngbya lemnetica (Anaga.) Anagnostidis and Komarek*	145.6	1.9	389.3	-	-	-	-	-	-	-	-	-	-
1070	*Anabaenopsis sp.*	3.0	3.0	14.1	+	-	+	-	-	-	-	-	-	-
1077	*Pseudanabaena sp.*	2.7	2.7	16.8	-	+	-	-	+	+	-	+	+	+
1084	*Gloeocapsa punctata*	4.0	4.0	33.5	-	-	-	+	+	+	+	+	+	+
1086	*Calothrix sp.*	92.2	9.5	4439.5	-	-	-	-	-	-	+	+	+	+
1102	*Gloeothece sp.*	2.0	2.0	4.4	-	-	-	-	-	-	-	-	-	-
1122	*Phormidium autumnale Agardh*	119.8	6.0	3385.9	-	-	-	+	+	-	-	-	-	-
1124	*Petalonema alatum Berk*	77.3	6.0	2203.2	+	+	+	+	+	+	+	+	+	+
1131	*Heteroleibeinia profunda Komarek*	23.1	2.0	72.5	-	-	-	-	-	-	-	-	-	-
1136	*Lyngbya mucicola Lemmermann*	59.5	1.0	46.8	-	-	-	-	-	-	-	-	+	+
1223	*Chamaesiphon incrustans Smith*	6.6	3.1	33.2	-	-	-	-	-	-	-	-	-	-
1239	*Homoeothrix varians Komarek & Kalina*	82.3	3.2	653.7	-	-	-	-	-	-	-	-	-	-
	Chlorophyte													
2205	*Mougeotia sp.*	46.9	9.2	3538.9	-	-	-	-	-	-	-	-	-	+
2216	*Zygnema sp.*	44.0	10.0	3455.8	-	-	-	-	+	-	-	-	-	-
2231	*Bulbochaete sp.*	19.6	6.0	554.2	-	-	-	-	-	-	-	-	-	-
	Chrysophyte													
4388	*Dinobryon sertularia Ehrenberg*	12.0	6.0	226.2	-	-	-	-	-	-	-	-	-	-
	Diatom													
5306	*Navicula minima Grunow*	11.1	4.5	61.9	-	-	-	-	-	-	-	-	-	-
5311	*Cymbella minuta Kutzing*	15.6	8.0	391.1	-	-	-	-	-	+	+	-	-	-
5507	*Cyclotella stelligera Cleve and Grunow*	21.4	21.4	3854.7	-	-	-	-	-	-	-	-	+	-
5509	*Cyclotella ocellata Pant.*	9.0	9.0	292.0	-	-	-	-	-	-	-	+	-	-
5513	*Tabellaria fenestrata (Lyngbye) Kutzing*	85.3	6.0	804.3	-	+	+	+	+	+	+	+	+	+
5514	*Tabellaria flocculosa (Roth) Kutzing*	27.6	14.1	1434.9	-	+	-	-	-	-	-	-	-	-
5518	*Synedra acus Kutzing*	110.0	2.0	115.2	+	-	-	-	-	-	+	-	-	-
5519	*Synedra acus v. radians (Kutzing) Hustedt*	63.1	2.0	66.1	-	-	-	-	-	-	-	-	-	-
5523	*Synedra ulna (Nitzsch) Ehrenberg*	225.0	6.0	2120.6	-	+	-	-	-	-	-	-	-	-
5546	*Gyrosigma sp*	73.7	6.2	1119.6	-	-	-	-	+	-	-	-	-	-
5547	*Frustulia rhomboides (Ehrenberg) de Toni*	74.5	11.0	3667.3	+	+	+	+	+	+	+	-	+	+
5551	*Cyclotella michiganiana Skvortzow*	5.0	5.0	48.8	+	+	+	+	+	+	+	+	+	+
5702	*Achnanthes minutissima Kutzing*	19.6	4.0	82.2	-	-	-	-	-	-	+	-	+	-
5720	*Cyclotella bodanica Eulenst.*	34.0	34.0	15454.7	+	+	-	-	-	-	-	+	-	-
5726	*Eucocconeis sp.*	40.3	20.4	4404.5	-	-	-	-	-	-	-	+	-	-
5728	*Epithemia argus Kutzing*	44.0	12.0	1658.8	-	-	-	-	-	-	-	-	-	-
5750	*Navicula subtilissima Cleve*	56.0	8.0	938.3	+	-	-	-	-	-	-	-	-	-
5767	*Nitzschia fonticola Grunow*	18.0	4.0	75.4	-	-	-	-	-	-	-	-	-	-
5768	*Nitzschia linearis W. Smith*	75.0	8.0	1256.6	-	-	-	-	-	-	-	-	-	-
5820	*Eunotia arcus Ehrenberg*	40.0	12.0	1508.0	-	-	-	-	-	-	-	-	-	-
5836	*Encyonema silesiacum (Bleisch) D.G. Mann*	30.0	10.0	1178.1	-	-	-	-	-	-	-	-	-	-
5854	*Pinnularia borealis Ehrenberg*	70.5	10.0	1845.7	-	-	-	-	-	-	-	+	+	+
5857	*Nitzschia filiformis (W. Smith) Hustedt*	41.0	4.3	192.8	+	+	+	-	-	+	-	-	-	-
5860	*Diatoma vulgare Bory*	27.2	5.5	234.8	-	-	-	-	-	-	-	-	-	-
5870	*Navicula radiosa Kutzing*	71.0	10.0	1858.8	-	-	-	+	+	+	-	-	+	-
5873	*Gomphonema minutum*	27.7	8.0	463.5	-	-	-	-	-	-	-	-	-	-
5874	*Nitzschia palea (Kutzing) W. Smith*	80.5	8.5	1563.2	-	-	-	-	-	-	-	-	-	-
5875	*Cocconies disculus Schum.*	30.5	18.0	2587.1	-	-	-	-	-	-	-	-	-	-
5881	*Diatoma elongatum Agardh*	61.0	4.7	352.1	-	+	+	+	+	-	+	+	+	+
5882	*Anomoenies vitrea Ross*	37.9	5.9	336.2	-	-	-	-	-	-	-	-	-	-
5884	*Gomphonema angustum Agardh*	41.0	10.0	1073.4	+	-	-	-	-	+	+	-	+	-
5910	*Navicula exigua (Greg.) Muller*	36.8	6.0	347.3	-	+	-	-	-	+	-	-	-	-
5916	*Fragilaria capucina Grunow*	60.5	4.0	253.5	-	-	-	-	-	-	-	-	-	-
	Total Richness				**9**	**12**	**8**	**9**	**12**	**12**	**12**	**12**	**15**	**12**

APPENDIX L
WHALE TAIL 2019 MERCURY MONITORING REPORT

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

ACKNOWLEDGEMENTS

The following people were involved in the Mercury Monitoring Program for the Whale Tail Pit project were:

- Gary Mann (Azimuth) – Gary was responsible for overall management of this project. He also provided oversight and was the primary reviewer.
- Laura Bekar and Marianna DiMauro (Azimuth) – Laura tabulated the data and was the principal author of the report. Marianna was responsible for plotting the water and sediment chemistry data.
- Eric Franz (Azimuth) – Eric was responsible for overall coordination of the Meadowbank and While Tail programs Azimuth is involved with. Eric assisted in preparing the data and reviewed the report.
- North/South Consultants for providing the fish data from the 2018 fish-out.
- Jared Ellenor and Ryan Vanengen (Swanson Lab) at the University of Waterloo for providing mercury data collected during the 2018 and 2019 research studies. Jared collected the water samples for total and methylmercury analysis in 2018 and 2019.
- Wen Xu at the University of Western Ontario for analysis of water and fish tissue samples for total and methylmercury. Data were reported to Dr. Heidi Swanson's research group at the University of Waterloo.

ACRONYMS

CCME	Canadian Council of Ministers of the Environment
CREMP	Core Receiving Environment Monitoring Program
CRM	Certified Reference Material
DQO(s)	Data Quality Objective(s)
dw	dry weight
FEIS	Final Environmental Impact Statement
ISQG	Interim sediment quality guidelines (CCME sediment quality guidelines)
LKTR	Lake Trout
MAM	Mammoth Lake
MB	Method blank
MDL	Method detection limit
MRL	Method Reporting Limit
MS	Matrix spike
NEM	Nemo Lake
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
PEL	Probable effect level (CCME sediment quality guidelines)
QA/QC	Quality Assurance / Quality Control
RPD	Relative percent difference
SOP	Standard Operating Procedure
US EPA	United States Environmental Protection Agency
WTS	Whale Tail Lake South Basin
ww	wet weight

L.1 INTRODUCTION

L.1.1 Background

The Amaruq Exploration Property is a 408-square kilometer area located on Inuit Owned Land, approximately 150 kilometers north of Baker Lake and approximately 50 kilometers northwest of the Meadowbank mine. Approval for development of the Whale Tail Project was issued in 2018 (NIRB Project Certificate No. 008). The Project, located on the Amaruq site, is operated as an extension to the operational Meadowbank Mine.

Construction of the dike separating the north and south basins of Whale Tail Lake began in 2018 and of the Whale Tail Lake diversion occurred in 2019. At peak water levels, the diversion channel to Mammoth Lake will act as the outflow from Whale Tail Lake south basin. Inputs from the 2020 freshet are expected to discharge to Mammoth Lake south basin via the diversion channel, thus maintaining water levels in Whale Tail Lake at operational levels.

Mercury is a naturally occurring element that is found in low levels everywhere- in air, water, soil, plants, animals, and humans. In aquatic environments, bacteria turn naturally occurring inorganic mercury into methylmercury, a highly bioavailable form of mercury. Methylmercury is readily bioaccumulated and biomagnified through the food chain, meaning it is found in the highest concentrations in long lived animals near the top of the food chain (e.g., lake trout). When terrestrial substrate is flooded, such is the case for the Whale Tail Lake south basin and sub-watershed lakes, there can be an elevated rate of bacterial conversion of mercury to methylmercury, potentially resulting in increased concentrations of mercury and methylmercury in all components of the ecosystem.

Further background information on mercury in the environment, and the physical, chemical and ecological factors that drive mercury methylation dynamics in aquatic environments following flooding and soil inundation, is described in Azimuth (2017).

L.1.2 Mercury Monitoring Program Overview

In accordance with Condition 63 of NIRB Project Certificate No. 008 and NWB Water License 2AM WTP1826 Part I, Condition 5, a Mercury Monitoring Plan (MMP) was developed by Agnico Eagle (2019) to assess changes in concentrations of mercury in the Whale Tail Lake south basin and sub-watershed lakes as a result of Project-related flooding. Briefly, the core elements of the MMP are water chemistry, sediment chemistry, and fish tissue chemistry. Dr. Heidi Swanson (University of Waterloo) is leading the MMP sampling; Azimuth is providing support for sampling

(sediment) and reporting (i.e., as a supplemental component of the *Core Receiving Environment Monitoring Program* [CREMP]).

This 2019 MMP report is a compendium of the mercury chemistry data that has been collected to-date in relation to the impoundment of the south basin of Whale Tail Lake and it includes data collected prior to (i.e., baseline) and subsequent to impoundment. Sampling areas include locations within and downstream of the impoundment, as well as reference lakes. Water chemistry and fish data from 2018 are reported here for the first time.[1]

While dike construction was finished by early July 2018, the degree of flooding would have been minor when samples were collected in August 2018 (estimated < 25,000 m^2 of flooded terrestrial habitat [Attachment 1 in Azimuth 2019]). By August 2019, flooding was much more advanced, with > 1 million m^2 of terrestrial habitat expected to be flooded (Attachment 1 in Azimuth 2019).

While this 2019 MMP report presents 2019 (i.e., post-impoundment) data for surface water and bulk sediment, a more detailed discussion is planned for 2020, coinciding with the first year of fish chemistry data from the *after* period.

L.1.3 Report Structure

This memorandum is organized by the following sections:

- **Section L.1**: Introduction
- **Section L.2**: Overview of Mercury Data
- **Section L.3**: Water concentrations of mercury
- **Section L.4**: Sediment concentrations of mercury
- **Section L.5**: Fish concentrations of mercury

[1] In 2018 water, sediment and fish data were collected. Of these, only the sediment data was available by the 2018 reporting deadline (Agnico Eagle 2019).

L.2 MERCURY DATA OVERVIEW

MMP sampling locations are shown in **Figure L2-1** and a summary of the mercury-related data by media and year is provided in **Table L2-1.**

Mercury samples in various media types have been collected at the following lakes:

- Whale Tail Lake south basin (WTS/WTL) – impounded in 2018 (only minor flooding by August 2018, but much more extensive by August 2019) and is expected to be fully flooded by June 2020. Note that the diversion channel will not be operational until spring 2020, so there would have been no connectivity from WTS to downstream stations in either 2018 or 2019.
- Lakes A20, A63, A65 – inside the full-flood zone of the impoundment. All would still have been independent from WTS in August 2018, but part of the contiguous impoundment in August 2019.
- Mammoth Lake (MAM/MMT) – immediately downstream of the diversion channel serving as an outlet from the impoundment.
- Lake A76 – downstream of MAM.
- Lake DS-1 – the furthest downstream station in the watershed.
- Nemo Lake (NEM), Lake 8, Inugguguayualik Lake (INUG) and Pipedream Lake (PDL) – reference lakes not connected to the Whale Tail Lake watershed.

The scope of the 2019 MMP was limited to surface water and sediment. Lake trout captured from the north basin of Whale Tail during the fish-out in August and September 2018 were analyzed for total mercury in February 2020. Moving forward, large-bodied fish tissue sampling for the MMP will be synchronized with the EEM Biological Monitoring program which is next scheduled for 2020. Small-bodied fish tissue sampling also occurred in 2018 with approximately 30 to 50 slimy sculpin (*Cottus cognatus*) caught and preserved for mercury analysis for each of the following lakes: Whale Tail Lake – South Basin, Mammoth Lake, A20, A65, A63, Lake 8. These samples are currently archived and will be analyzed with the fish captured for MMP in 2020.

Benthic invertebrates and zooplankton were sampled during the baseline period; under the MMP, additional sampling of these media are only planned if impact assessment predictions are exceeded.

Locations of soil sampling in 2016 (baseline year) are now flooded and categorized as sediment sampling locations.

Legend

- Watershed Boundaries

Project Features

- Max Impoundment Area

Site Plan - August 2019 version

- Esker / Quarry
- Infrastructure
- Amaruq haul road
- Proposed Road
- All-weather Access Road (AWPAR)

AZIMUTH

Client	Agnico Eagle Mines Limited - Meadowbank Division
Figure L2-1	Study areas included in the Mercury Monitoring Program
Project	Whale Tail 2019 Mercury Monitoring Report

Date: March 27, 2020
Datum: NAD 83 UTM Zone 14N
Scale: 1:100,000
Software: QGIS version 3.4.13-Maderia

REFERENCES:
1. Study area layers from Agnico Eagle.
2. Basemap imagery from Google.

Table L2-1. Summary of available mercury-related data for the Mercury Monitoring Program.

		Station Area:	Near-Field		Mid-Field				Far-Field	Reference					
Sampling Media	**Year**	**Mercury parameters** (MeHg = methylmercury; Hg = mercury)	**WTL - South**	**Mammoth Lake**	**Lake A20**	**Lake A63**	**Lake A65**	**Lake A76**	**DS1**	**WTL - north**	**Nemo Lake**	**Lake 8**	**INUG**	**Pipedream Lake**	**Reference / Data Source**
Surface Water	2016	MeHg and Ultra-low DL total Hg	n=1	-	-	-	-	-	-	-	-	-	-	-	Azimuth 2018
	2017		n=1	n=1	-	-	-	-	-	-	-	-	-	-	Azimuth 2018
	2018		n=2	n=2	n=2	n=2	n=2	n=2	-	-	n=2	n=2	-	-	Appendix L2
	2019		n=2	n=2	n=2	-	n=2	n=2	n=2	-	-	n=2	-	-	Appendix L1
	2014-2019	Regular DL total Hg	✓	✓	✓	-	-	✓	✓	-	✓	-	✓	✓	Annual CREMP Reports
Sediment	2016	Total Hg (grab)	n=5	n=5	n=5	-	-	n=5	n=5	-	n=5	-	n=5	n=5	Azimuth 2018
	2017	MeHg and total Hg (core)[1]	n=3	-	-	-	-	-	-	-	-	-	-	-	Azimuth 2018
		Total Hg (grab)	n=5	n=5	n=5	-	-	n=5	n=5	-	n=5	-	n=5	n=5	Azimuth 2017 CREMP
	2018	Total Hg (core)	n=9	-	-	-	-	-	-	-		n=8	-	-	Azimuth database
		Total Hg (grab)	n=5	n=5	n=5	-	-	n=5	n=5	-	n=5	n=5	n=5	n=4	Azimuth 2018 CREMP
	2019	Total Hg (grab)	n=5	n=5	n=5	-	-	n=5	n=5	-	n=5	n=5	n=5	n=5	Table L4-1
		MeHg (grab)	n=5	n=5	n=5	-	-	-	n=5	-	-	-	n=5	n=5	Table L4-1
Benthos Tissue	2017	MeHg and total Hg	n=3	-	-	-	-	-	-	-	-	-	-	-	Azimuth 2018
Zooplankton Tissue	2017	MeHg and total Hg	n=1	n=1	-	-	-	-	-	-	-	-	-	-	Azimuth 2018
Large-Bodied Fish Tissue	2015	MeHg and total Hg	-	n=8	-	-	-	-	-	n=21	-	-	-	-	Portt and Associates 2015
	2018	total Hg	-	-	-	-	-	-	-	n=17	-	n=8	-	-	Appendix L3

Notes:
☑ = methods and data available; cited in the annual CREMP reports.
"-" = data do not exist
"n = " = number of samples collected/analyzed.
1. Samples were planned to be collected with a core sampler; however, due to core sampler being lost in the field, core sampling methods were simulated by collecting the top 1.5 cm from a Petite Ponar grab.

L.3 WATER CHEMISTRY

L.3.1 Overview

Mercury data for the MMP were collected as part of the routine CREMP, carried out jointly by Azimuth and Agnico Eagle, and as part of on-going studies carried out by researchers in Dr. Heidi Swanson's lab at the University of Waterloo.

Monthly mercury water quality data collected in March, May, July, August, and September as part of the routine CREMP water quality program from are reported in the main CREMP report (see figures and tables in **Appendix B2**). Routine mercury water quality data were collected and analyzed according to established SOPs for the CREMP.

Specifics of the mercury sampling for the MMP are provided below.

L.3.1.1 Sample Collection

Researchers in Dr. Swanson's lab collected surface water samples from the following areas in 2018 and 2019:

- 2018 – Eight study area lakes were sampled from August 15 to 20th: Whale Tail Lake South Basin (WTS / WTL), Mammoth Lake (MAM / MMT), Nemo Lake (NEM), Lake A20, Lake A76, Lake A63, Lake A65, and Lake 8. With the exception of Lakes A63 and A65, sampling was completed at the same time, and at the same locations as the CREMP water quality sampling locations.
- 2019 – Seven study area lakes were sampled from August 15 to 20th: Whale Tail Lake South Basin (WTS), Mammoth Lake (MAM), Lake A20, Lake A76, Lake DS1, Lake A65, and Lake 8. With the exception of Lake A65, sampling was completed at the same time, and at the same locations as the CREMP water quality sampling locations.

Samples were collected using *clean-hands / dirty hands* protocols developed by the lab. Methylmercury and ultra-low mercury surface water samples were collected as surface level-grabs. Sample bottles were double-bagged from the lab and returned to lab in the same double-bags. Samples were collected by a sampling team of two people, one team member designated the *clean hands* to handle inner bag, sample container, and filtering, and the second team member designated the *dirty hands* to handle the outer bag, but never contact the sample container or inner bag. Samples for total (unfiltered) and dissolved (filtered) methylmercury analysis were preserved with HCl in the field. While the results for unfiltered samples are

reported herein, the results for filtered samples will be reported elsewhere by the University of Waterloo (Dr. Heidi Swanson).

L.3.1.2 Laboratory Methods

In 2019, water samples were analyzed for methylmercury and total[2] mercury using an ultra-low detection limit at Biotron, at the University of Western Ontario. This is a CALA accredited laboratory, with detection limits for mercury that are lower than those available from commercial analytical labs. The samples were transported in coolers with ice packs and shipped to Biotron at the earliest convenience to minimize the possibility of exceeding the recommended hold-times between collection and analysis. Samples were analyzed using ultra-low detection methods for total mercury (Cold Vapour Atomic Fluorescence – Digestion, Method Ref. modified from EPA 1631, Lab Method ID - TM.0811) and methyl mercury (Cold Vapour Atomic Fluorescence Spectrophotometry, Method Ref. modified from EPA 1630, Lab Method ID - TM.0812).

L.3.2 Quality Assurance/Quality Control

The objective of quality assurance / quality control (QA/QC) is to assure that the chemical data collected are representative of the material or populations being sampled, are of known quality, have sufficient laboratory precision to be highly repeatable, are properly documented, and are scientifically defensible. Data quality was assured throughout the collection and analysis of samples using specified standardized procedures, by the employment of laboratories that have been certified for all applicable methods, and by staffing the program with experienced technicians.

The QA/QC summary for the routine mercury water samples collected as part of the CREMP are reported in **Appendix A** of the 2019 CREMP report. QA/QC results reported by the University of Western Ontario are provided in **Appendix L-1** and summarized below.

- 2019 laboratory duplicate samples analyzed for methylmercury and ultra-low trace mercury had an RPD of 19% and 7%, respectively.
- Matrix spike RPD for methylmercury and ultra-low trace mercury was 4% and 2% respectively.

[2] The “total” in total mercury refers to the inclusion of all species of mercury (i.e., both inorganic and organic forms). To avoid confusion, we use the term “unfiltered” rather than “total” when addressing partitioning between particulate-bound and dissolved phases.

- The method blank (MB) was less than method detection limit for both methylmercury and ultra-low trace mercury analyses.

There were no flags on quality control violations for Biotron.

L.3.3 Water Mercury Data

As discussed in **Section L.1.1**, dike construction was completed by early July 2018 and only minor flooding would have been expected by August of that year. By August 2019, flooding was extensive within the impoundment, resulting in connectivity between Whale Tail Lake south basin and lakes A20, A63 and A65. However, at that time, the diversion channel to Mammoth Lake was not operational, so there would not have been any connectivity to the downstream lakes.

Surface water methylmercury and total mercury in unfiltered samples collected in 2016 through 2019 are presented in **Table L3-1** and shown in **Figure L3-1**. The figure includes the CCME water quality guidelines for the protection of aquatic life for both total mercury (26 ng/L) and methylmercury (4 ng/L); the total mercury plot includes the CREMP trigger value, which was set between the CCME guideline (CREMP threshold) and the baseline/reference conditions (CCME 2020a). Note that the 2019 results appear somewhat anomalous for both total mercury and methylmercury. For total mercury, results jumped from around 0.5 ng/L or lower to nearly 20 ng/L across all stations. While less pronounced, similar changes were observed for methylmercury, but less consistently across stations. Assuming that data quality objectives have been met (see **Section L.3.2**), the observed results suggest the possibility of either the a regional climate-influenced change in mercury concentrations in 2019 (e.g., due to higher rainfall and associated runoff to all lakes) or of some other influence on data quality. At the time of this report, we are currently working with Agnico Eagle, the lab (Biotron) and researchers at the University of Waterloo about the accuracy of the 2019 results.

In situ water quality parameters collected by Azimuth as part of the routine CREMP (temperature, DO, Sp. Conductivity, pH) are provided in the main document. There was no evidence of stratification in the 2019 limnology profiles at the CREMP study area lakes. The lakes are typically well-mixed throughout the open-water period as evidenced by consistent DO, Sp. Conductivity, and temperature readings from the surface of the lakes to near-bottom.

Table L3-1. Total and methylmercury concentrations in unfiltered surface water, Whale Tail MMP 2016 – 2019.

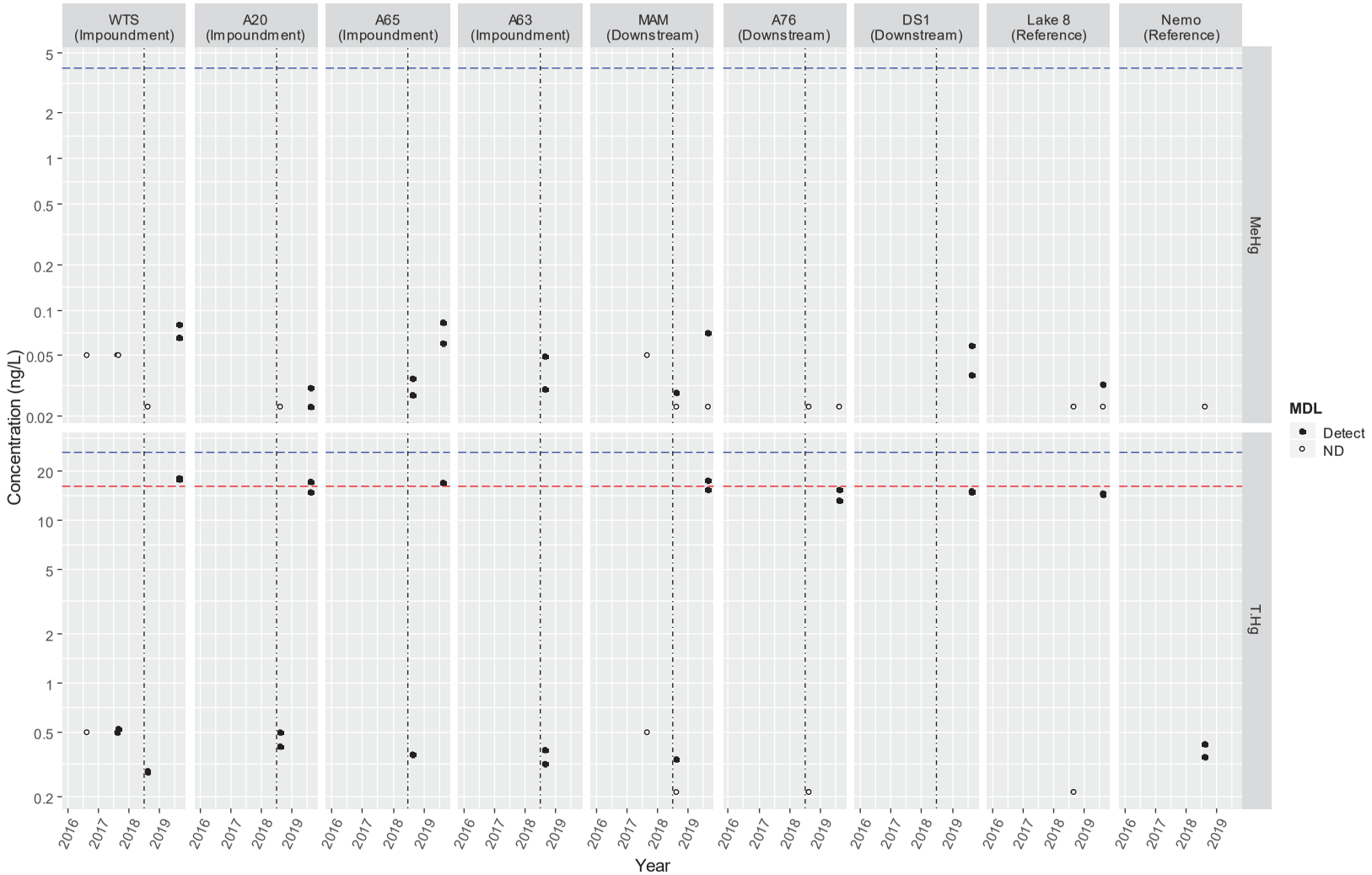
Area	Lake	Year	Area-Replicate ID	Date	Mercury (ng/L)	
					MeHg	THg
Impoundment	Whale Tail Lake – South Basin	2016	WTS-12	17-Aug-16	<0.05	<0.50
		2017	WTS-23	14-Aug-17	<0.05	0.50
		2017	WTS-23	28-Aug-17	<0.05	0.52
		2018	WTL-01	16-Aug-18	<0.023	0.29
		2018	WTL-02	16-Aug-18	<0.023	0.28
		2019	WTL-01	18-Aug-19	0.066	18.1
		2019	WTL-02	18-Aug-19	0.080	17.8
	Lake A20	2018	A20-01	17-Aug-18	<0.023	0.50
		2018	A20-02	17-Aug-18	<0.023	0.41
		2019	A20-01	16-Aug-19	0.030	17.2
		2019	A20-02	16-Aug-19	0.023	14.9
	Lake A63	2018	A63-01	20-Aug-18	0.030	0.32
		2018	A63-02	20-Aug-18	0.049	0.39
	Lake A65	2018	A65-01	20-Aug-18	0.027	0.36
		2018	A65-02	20-Aug-18	0.035	0.36
		2019	A65-01	19-Aug-19	0.083	17.1
		2019	A65-02	19-Aug-19	0.060	16.8
Downstream	Mammoth Lake	2017	MAM-23	28-Aug-17	<0.05	<0.5
		2018	MMT-01	16-Aug-18	<0.023	0.34
		2018	MMT-02	16-Aug-18	0.029	<0.215
		2019	MMT-01	20-Aug-19	0.071	17.4
		2019	MMT-02	20-Aug-19	<0.023	15.3
	Lake A76	2018	A76-WQ01	18-Aug-18	<0.023	<0.215
		2018	A76-WQ02	18-Aug-18	<0.023	<0.215
		2019	A76-01	15-Aug-19	<0.023	13.2
		2019	A76-02	15-Aug-19	<0.023	15.3
	Lake DS1	2019	DS1-01	17-Aug-19	0.058	14.8
		2019	DS1-02	17-Aug-19	0.037	15.0
Reference	Nemo Lake [a]	2018	NEM-WQ01	17-Aug-18	<0.023	0.42
		2018	NEM-WQ02	17-Aug-18	<0.023	0.35
	Lake 8	2018	LK8-WQ01	21-Aug-18	<0.023	<0.215
		2018	LK8-WQ02	21-Aug-18	<0.023	<0.215
		2019	LK8-WQ01	16-Aug-19	0.032	14.6
		2019	LK8-WQ02	16-Aug-19	<0.023	14.3

Notes

[a] Nemo Lake is located north of the site, in a sub-watershed that is not impacted by the impoundment. Nemo was dropped as a sampling area by researchers at the U of Waterloo in favor of DS1 in 2019.

Figure L3-1. Total mercury and methylmercury (ng/L) in unfiltered surface water samples, Whale Tail MMP 2016 – 2019.

Notes: The red dashed line = trigger value. The blue dashed lines = freshwater quality guideline for the protection of aquatic life (CCME 2020a). The vertical black dashed line indicates the date when the Whale Tail dike was completed, and the impoundment began filling.



L.4 SEDIMENT CHEMISTRY

L.4.1 Overview

The MMP consists of both grab samples and core samples. Grab samples integrate sediment chemistry across the top 3 to 5 cm, so provide a good understanding of sediment chemistry within the biologically active zone. However, in these headwater lakes with little natural sedimentation, they are less useful for quantifying changes in sediment chemistry in the most active layer close to the sediment-water interface. As in the CREMP, the MMP (Agnico Eagle) includes sediment coring to obtain higher resolution samples at specific depths (e.g., 1 to 1.5-cm thick slices). Grab samples will be collected each year, while cores will be collected every three years moving forward (i.e., coinciding with environmental effects monitoring [EEM] under the *Metal and Diamond Mining Effluent Regulations*; the first cycle is planned for 2020).

Baseline sediment coring was conducted in 2017/2018 following the SOP used for the Meadowbank and WTP CREMP. As discussed above, coring will be conducted next in 2020.

Sediment samples were collected by grab sampler for the analysis of methylmercury and total mercury from nine sampling locations in 2019 (**Table L2-1** and **Figure L2-1**). This section provides an overview of the MMP collection and analysis methods for methylmercury and total mercury in sediment grabs.

L.4.1.1 Sample Collection

Sediment samples were collected using a Petite Ponar grab sampler (6” x 6”). Each sample was a composite of two grabs. Sediment was collected by lowering the grab to within 1 m of the sediment, at which point the rate of descent was slowed to minimize disruption of the surficial layer of sediment. Upon retrieval, the grab was placed in a large stainless-steel bowl and inspected according to the acceptability criteria outlined in the SOP, namely: the absence of large foreign objects, adequate penetration depth, the grab is not overfilled, the jaws closed completely (i.e., well-sealed), and the sediment surface in the grab is undisturbed. Grabs that failed the acceptability criteria were discarded into a 20-L bucket and retained until sampling was completed at the station.

The top 3 to 5 cm was collected, consistent with Meadowbank and WTP CREMP protocols and analyzed for metals (including total mercury), TOC, and particle size.

L.4.1.2 Laboratory Methods

Sediment samples were submitted to ALS (Burnaby, BC) for analysis. The samples were transported in coolers with ice packs and shipped to ALS at the earliest convenience to minimize the possibility of exceeding the recommended hold-times between collection and analysis.

Analysis of methylmercury in sediment was completed by ALS following methodology prepared for the US Geological Survey; methylmercury is extracted from the sample and analyzed by cold vapour atomic fluorescence spectrophotometry. Total mercury in sediment is also analyzed by cold vapour atomic fluorescence spectrophotometry, following US EPA methods. Moisture content was determined gravimetrically.

L.4.2 Quality Assurance / Quality Control

A complete list of the sediment parameters, detection limits, data quality objectives, and method references is present in Table 1 of the SOP (Azimuth 2015). This QA/QC assessment is limited to the sediment samples collected in 2019 for methylmercury and total mercury analysis.

L.4.2.1 QA/QC Methods

Field QA/QC

Field QA to avoid cross-contamination consisted of taking precautions between sampling areas by rinsing and cleaning the sampling gear for sediment grabs (Petite Ponar grab, stainless steel compositing bowls and spoons) and using site water and phosphate-free cleaning detergent.

Field QC measures for sediment grab and core sampling conducted as part of the regular WTP Baseline CREMP were conducted on approximately 10% of original samples. These measures included field duplicates to characterize spatial heterogeneity and assess consistency in field methodology, and also filter swipes of the sampling equipment or coring tube to assess cleaning procedures.

Laboratory QC

The laboratory QC program for the methylmercury analysis in sediment consisted of method blanks and CRM/LCS. One laboratory duplicate was analyzed for the two batches of samples submitted to ALS in 2019 (L2333924 & L2338125).

L.4.2.2 QA/QC Results

QA/QC results for mercury analyzed in sediment as part of the CREMP are provided in **Appendix A**. QA/QC results were acceptable with the equipment blank (filter swipe) having no detectable levels of total mercury and all the mercury field duplicate RPDs were < 50%.

QA/QC results for the laboratory duplicate of the methylmercury/mercury sample are included in the lab data reports in **Appendix F** (L2333924 and L2338125). The RPDs met the lab-specified DQOs of 30% for methylmercury and 40% for total mercury.

The DL for total mercury was higher than previous years. The lab has been asked to provide the lower analytical DL (0.005 mg/kg) to match previous years.

L.4.3 Sediment Mercury Data

Methylmercury and total mercury concentrations in sediment samples collected between 2016 and 2019 are presented in **Table L4-2** (grabs) and **Table L4-3** (cores) and shown in **Figure L4-1**. Raw data are provided in **Appendix B** of the main CREMP report.

Sediment chemistry collected for the MMP show that total mercury in sediment at WTS is below CCME's (2020b) interim sediment quality guidelines (ISQGs) and probable effect level (PEL) in all sediment grab and core samples collected between 2016 and 2019. Further, there was no observed change in sediment total mercury concentrations, which is not unexpected given that the sampling focused on locations that were inundated prior to impoundment.

Methylmercury concentrations at WTS in 2019 ranged between less than DL (0.0005 mg/kg) and 0.00072 mg/kg. These results are consistent with baseline data from 2016, when methylmercury concentrations measured between 0.00033 and 0.00061 mg/kg.

The 2019 mercury concentrations in sediment grabs from WTS are similar to baseline conditions prior to flooding activities in 2018. Sediment coring planned for 2020 should also include locations within the flood zone to allow spatial comparison between flooded and original substrates within the impoundment.

Table L4-1. Total mercury and methylmercury concentrations in sediment grabs from the Whale Tail Pit Study Area Lakes in 2019.

Area-Rep	Date	ALS Sample ID	Phys Parameters		Particle Size				Total Organic Carbon	Mercury (mg/kg dw)	
			Moisture	pH	% Gravel	% Sand	% Silt	% Clay		Total	MeHg
			%	pH	%	%	%	%	%	mg/kg	mg/kg
INUG-1	15-Aug-2019	L2338125-1	82.1	4.64	*<1.0*	6.9	72.0	21.2	3.22	*<0.050*	0.000142
INUG-2	15-Aug-2019	L2338125-2	80.7	5.40	*<1.0*	13.0	68.6	18.5	2.64	*<0.050*	0.000117
INUG-3	15-Aug-2019	L2338125-3	84.7	5.32	*<1.0*	4.9	71.3	23.7	3.42	*<0.050*	0.000160
INUG-4	15-Aug-2019	L2338125-4	82.5	5.03	*<1.0*	2.8	73.2	24.0	3.36	*<0.050*	0.000149
INUG-5	15-Aug-2019	L2338125-5	83.5	4.87	*<1.0*	2.4	74.8	22.7	3.58	*<0.050*	0.000301
									Average	*<0.05*	**0.000174**
PDL-1	14-Aug-2019	L2333924-25	84.4	5.22	*<1.0*	12.5	76.5	11	3.52	*<0.050*	0.000129
PDL-2	14-Aug-2019	L2333924-26	85.3	5.19	*<1.0*	9.8	80	10.3	4.2	*<0.050*	0.000167
PDL-3	14-Aug-2019	L2333924-27	70.4	5.6	*<1.0*	29.7	65.8	4.5	1.75	*<0.050*	0.000113
PDL-4	14-Aug-2019	L2333924-28	72.7	6.02	*<1.0*	8.5	75	16.5	1.88	*<0.050*	*<0.000050*
PDL-5	14-Aug-2019	L2333924-29	78.1	5.75	*<1.0*	12.5	76.2	11.4	2.59	*<0.050*	0.000068
									Average	*<0.050*	**0.000119**
WTS-1	18-Aug-2019	L2338125-7	82.1	4.99	*<1.0*	6.3	75.1	18.7	3.66	*<0.050*	0.000228
WTS-2	18-Aug-2019	L2338125-8	83.0	4.95	*<1.0*	5.6	78.9	15.5	4.04	0.051	0.000484
WTS-3	18-Aug-2019	L2338125-9	87.2	5.65	*<1.0*	3.7	77.0	19.3	6.11	0.056	0.000713
WTS-4	18-Aug-2019	L2338125-10	87.6	4.90	*<1.0*	2.0	81.5	16.5	5.54	0.063	0.000723
WTS-5	18-Aug-2019	L2338125-11	78.1	5.64	*<1.0*	7.2	71.7	21.1	2.7	*<0.050*	*<0.000050*
									Average	**0.057**	**0.000537**
MAM-1	19-Aug-2019	L2338125-19	90.8	5.22	*<1.0*	*<1.0*	84.9	14.6	9.87	0.081	0.000639
MAM-2	19-Aug-2019	L2338125-20	91.0	5.61	*<1.0*	*<1.0*	83.0	16.3	9.74	0.067	0.000658
MAM-3	19-Aug-2019	L2338125-21	90.2	5.80	*<1.0*	*<1.0*	83.2	16.0	9.85	0.078	0.00104
MAM-4	19-Aug-2019	L2338125-22	89.8	5.09	*<1.0*	*<1.0*	82.5	16.7	8.84	0.068	0.000500
MAM-5	19-Aug-2019	L2338125-23	89.5	5.38	*<1.0*	*<1.0*	81.4	17.9	10.4	0.093	0.00134
									Average	**0.077**	**0.000835**

Area-Rep	Date	ALS Sample ID	Phys Parameters		Particle Size				Total Organic Carbon	Mercury (mg/kg dw)	
			Moisture	pH	% Gravel	% Sand	% Silt	% Clay		Total	MeHg
			%	pH	%	%	%	%	%	mg/kg	mg/kg
A20-1	16-Aug-2019	L2338125-25	87.3	4.92	*<1.0*	*<1.0*	67.8	31.6	4.68	*<0.050*	0.000299
A20-2	16-Aug-2019	L2338125-26	72.0	5.41	1.5	7.6	50.9	40.0	1.29	*<0.050*	0.000107
A20-3	16-Aug-2019	L2338125-27	90.9	5.37	*<1.0*	*<1.0*	69.0	30.3	7.78	*<0.050*	0.000462
A20-4	16-Aug-2019	L2338125-28	87.7	4.93	*<1.0*	1.2	66.1	32.7	4.74	*<0.050*	0.000482
A20-5	16-Aug-2019	L2338125-29	86.5	5.74	*<1.0*	2.1	62.3	35.6	4.58	*<0.050*	0.00117
									Average	*<0.05*	**0.000504**
DS1-1	17-Aug-2019	L2338125-37	73.2	6.57	*<1.0*	1.3	79.1	19.7	1.62	0.053	0.000084
DS1-2	17-Aug-2019	L2338125-38	68.6	6.71	*<1.0*	1.3	77.4	21.3	1.45	*<0.050*	0.000158
DS1-3	17-Aug-2019	L2338125-39	72.9	6.01	*<1.0*	1.0	76.5	22.5	1.88	0.064	0.000283
DS1-4	17-Aug-2019	L2338125-40	65.7	6.68	*<1.0*	1.8	75.7	22.5	1.28	*<0.050*	*<0.000050*
DS1-5	17-Aug-2019	L2338125-41	70.3	6.09	*<1.0*	*<1.0*	76.0	23.0	1.82	0.064	0.000330
									Average	**0.060**	**0.000214**

Notes
Total mercury concentrations in sediment from Nemo Lake (NEM) and Lake A76 are reported in tables in the main CREMP report.

Table L4-2. Sediment grab sample chemistry data for WTS, Whale Tail MMP 2016–2019.

Year	Sample ID	Depth (cm)	Date	Moisture (%)	pH	TOC (% dw)	% Gravel (>2mm)	% Sand (2.00mm - 0.063mm)	% Silt (0.063mm - 4µm)	% Clay (<4µm)	Available Sulfate-S	Mercury (mg/kg dw)	Methyl Mercury (mg/kg dw)
2016	WTS-1	3 to 5	12-Aug-16	84	6.3	4.9	*<0.10*	3.29	79.7	17	32	0.0788	0.00059
	WTS-2	3 to 5	12-Aug-16	85	5.9	4.3	*<0.10*	4.36	78.9	16.8	22	0.0675	0.00033
	WTS-3	3 to 5	12-Aug-16	88	5.8	6.8	*<0.10*	4.15	77.6	18.2	26	0.0816	0.00010
	WTS-4	3 to 5	12-Aug-16	89	5.9	7.9	*<0.10*	2.2	78	19.8	21	0.0683	0.00046
	WTS-5	3 to 5	12-Aug-16	86	6.4	4.7	*<0.10*	4.02	75.6	20.3	44	0.0932	0.00061
2017	WTS-1	3 to 5	12-Aug-17	88	5.6	6.1	*<1.0*	3.2	82.1	14.7	-	0.0890	-
	WTS-2	3 to 5	12-Aug-17	84	5.1	4.2	*<1.0*	7.7	77.1	15.2	-	0.0526	-
	WTS-3	3 to 5	12-Aug-17	87	5.6	6.7	*<1.0*	3.3	76.9	19.8	-	0.0721	-
	WTS-4	3 to 5	12-Aug-17	88	5.8	7.3	*<1.0*	3.2	76.7	20.1	-	0.0657	-
	WTS-5	3 to 5	12-Aug-17	85	5.6	4.8	*<1.0*	4.3	73.5	22.2	-	0.0569	-
2018	WTS-1	3 to 5	13-Aug-18	82	5.9	4.0	*<1.0*	5	79.8	15.2	-	0.0518	-
	WTS-2	3 to 5	13-Aug-18	83	5.8	3.7	*<1.0*	4.4	84.3	11.4	-	0.0560	-
	WTS-3	3 to 5	13-Aug-18	81	5.2	4.4	*<1.0*	2.9	91.6	5.5	-	0.0381	-
	WTS-4	3 to 5	13-Aug-18	89	5.7	7.5	*<1.0*	1.9	79.7	18.4	-	0.0695	-
	WTS-5	3 to 5	13-Aug-18	84	5.3	4.2	*<1.0*	3.5	86.2	10.4	-	0.0568	-
2019	WTS-1	3 to 5	18-Aug-19	82.1	4.99	3.66	*<1.0*	6.3	75.1	18.7	-	*<0.050*	0.00023
	WTS-2	3 to 5	18-Aug-19	83.0	4.95	4.04	*<1.0*	5.6	78.9	15.5	-	0.051	0.00048
	WTS-3	3 to 5	18-Aug-19	87.2	5.65	6.11	*<1.0*	3.7	77.0	19.3	-	0.056	0.00071
	WTS-4	3 to 5	18-Aug-19	87.6	4.90	5.54	*<1.0*	2.0	81.5	16.5	-	0.063	0.00072
	WTS-5	3 to 5	18-Aug-19	78.1	5.64	2.7	*<1.0*	7.2	71.7	21.1	-	*<0.050*	*<0.000050*

Notes
Italicized numbers are below detection limits.
'-' Not measured

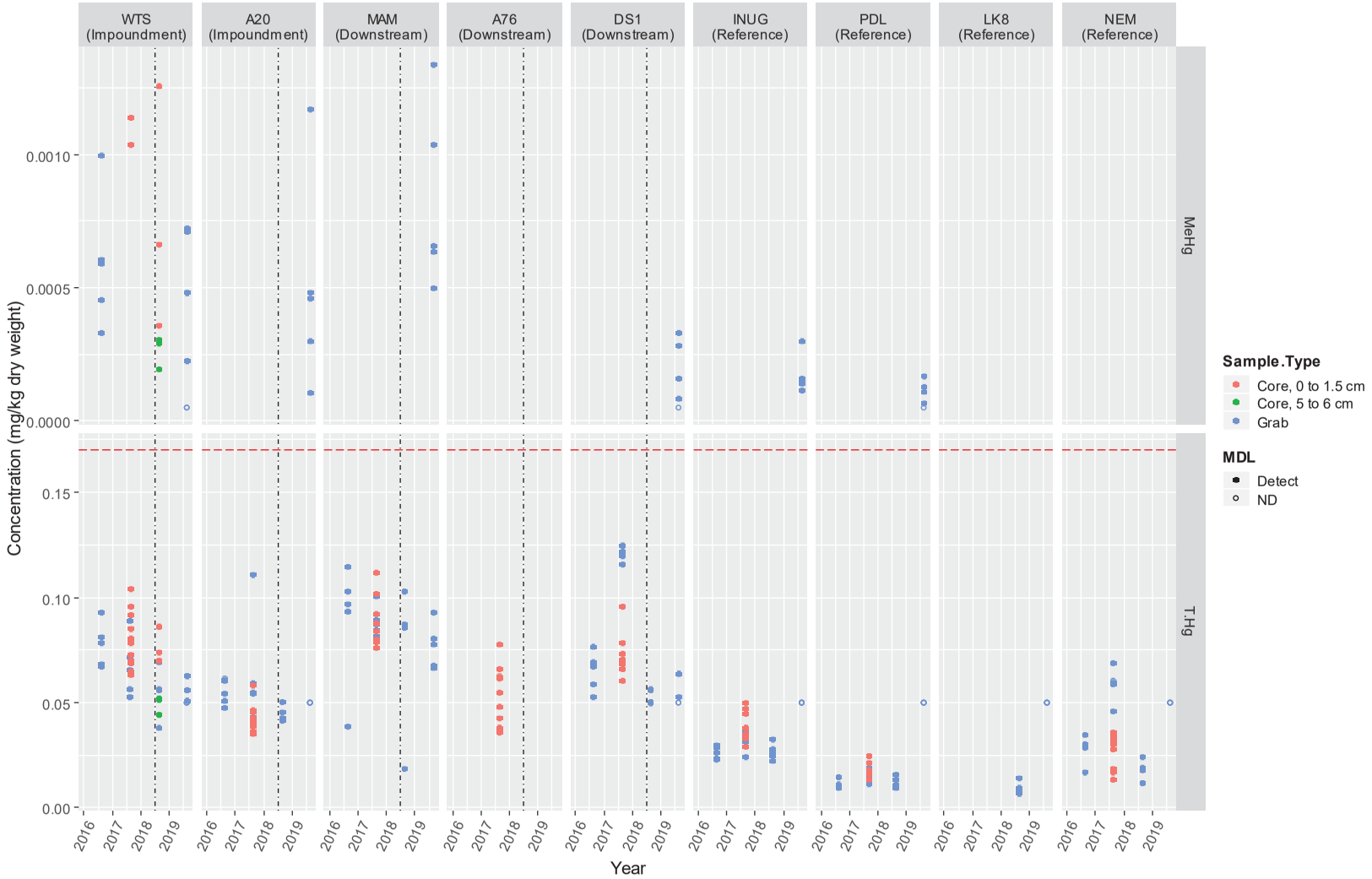
Table L4-3. Sediment core sample chemistry data for WTS, Whale Tail MMP 2017–2018.

			Lake	Whale Tail Lake South Basin (WTS) -CORES											
			Year	2017			2018								
			Sample ID	WTS-SC-1	WTS-SC-5	WTS-SC-9	WTS-1			WTS-2			WTS-3		
	CCME (2020)		Sample Type	core	core	Core	core	core	core	core	core	core	core	core	core
	Guideline[a]		Depth (cm)	top 1.5	top 1.5	top 1.5	0 to 1	5 to 6	10 to 11	0 to 1	5 to 6	10 to 11	0 to 1	5 to 6	10 to 11
Parameter	**ISQG**	**PEL**	**Date**	15-Aug-17	15-Aug-17	15-Aug-17	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18	18-Aug-18
Physical & Organic Parameters															
Moisture (%)				87.2	88.9	89.3	-	-	-	-	-	-	-	-	-
pH				6.2	5.9	6.0	-	-	-	-	-	-	-	-	-
Total Organic Carbon (% dw)				5.9	10.3	9.2	-	-	-	-	-	-	-	-	-
Total Metals (mg/kg dw)															
Mercury	0.17	0.486		0.069	0.096	0.081	0.0861	0.052	0.042	0.070	0.052	0.049	0.070	0.045	0.041
Speciated Metals (mg/kg dw)															
Methyl Mercury				0.0010	0.0011	0.0011	0.0013	0.00030	0.0014	0.00036	0.00029	0.000084	0.00066	0.00020	0.00030

Notes
Italicized numbers are below detection limits.
'-' Not measured
[a] CCME (Canadian Council of Ministers of the Environment) Canadian Sediment Quality Guidelines for the Protection of Aquatic Life, 1999; updated up to 2020.
ISQG = Interim freshwater Sediment Quality Guideline. ISQG = Interim sediment quality guideline; PEL = probable effect level.

Figure L4-1. Total mercury and methylmercury (mg/kg dry weight) in sediment samples from Whale Tail Study lakes 2016 - 2019.

Note: The red dashed line = interim sediment quality guideline (CCME 2020b). The vertical black dashed lines indicate the date when the Whale Tail dike was completed, and the impoundment began filling.



L.5 LARGE-BODIED FISH TISSUE CHEMISTRY

L.5.1 Overview

Fish sampling was completed in 2018 from the North Basin of Whale Tail Lake. Lake trout, Arctic char, and round whitefish were captured during the fish-out, and a select number of each fish species were retained for baseline characterization of metals concentrations in muscle tissue. Additional fish collections were completed at Lake A8 in 2018 to characterize baseline mercury concentrations in fish from a reference lake located closer to the Project than INUG and PDL, the two existing reference areas for the CREMP.

L.5.1.1 Sample Collection

Fish-out of the North Basin of Whale Tail Lake – The fish-out was conducted by North/South Consultants (Winnipeg, MB). Results of the fish-out were submitted to the *Department of Fisheries and Oceans* in accordance with project requirements. Fish were filleted in the field, tissue samples were placed in labelled whirlpak bags (labelled according to fish-out IDs), frozen, and shipped to University of Waterloo. All fish tissue samples collected by North/ South had skin and muscle tissue taken from the caudal peduncle.

The fish tissue sample sizes varied between samples; to maximize the preservation of baseline samples, University of Waterloo selected 20 of the largest tissue samples from each species (Round Whitefish, Arctic Char and Lake Trout) of samples taken from the 2018 Whale Tail Lake fish-out.

Lake A8 Reference – In 2018, University of Waterloo researchers collected eight lake trout tissue samples from Reference Lake 8. Fish were filleted in the field, tissue samples were placed in labelled whirlpak bags (labelled according to the Swanson lab IDs), frozen, and shipped to University of Waterloo. Tissue samples were collected following *Swanson Lab SOP – Fish sampling for chemical parameters*; tissue samples were taken from the muscle located above the lateral line and anterior to the dorsal fin. These eight samples were selected as a reference or control for this work and future productivity studies.

L.5.1.2 Laboratory Methods

Freeze Dry Sample Preparation – Tissue samples were partially or completely thawed (depending on the size of the fillet) and a sufficient portion of the fillet tissue (half of the fillet), without fish skin were extracted. Half of the fillet was extracted using sterilized scissors and placed with sterilized tweezers into labelled vials. The remaining samples were kept in the

whirlpack bags, placed back in the freezer in labelled larger ziplock bags that separated samples by species to be archived and used for future analysis. Scissors, tweezers and surfaces were cleaned with MilliQ and ethanol prior to sample preparation; a clean work area was maintained. All vials were acid washed prior to receiving fish tissue samples.

Tissue collected from the Reference Lake 8 were generally larger and therefore only partially thawed. Only 1/3 of the fillet was extracted.

Freeze Drying – Sample vials were covered with Kimtech tissues, placed back in the freezer and froze overnight. Following the *Swanson lab SOP for freeze drying*, lake trout and Arctic char from Whale Tail Lake were partially freeze dried on Thursday January 16th and on January 20th, 2020.

Capping and CoC preparation note: During preparation of samples, an error occurred in labelling sample from fish ID 501B-21. Both samples were submitted for analysis: 501B-21 dup and 501B-21. Based on the total mercury concentrations reported by Biotron, it is recommended these results are not used for analysis due to the uncertainty.

Analysis of total mercury in fish tissue was completed Biotron at the University of Western Ontario using a Milestone® DMA-80 Direct Mercury Analyzer in accordance with U.S. EPA method 7473 (U.S. EPA, 2007). Moisture content of tissues was not provided and was assumed to be 78%.

Mercury results were reported by Biotron as wet weight concentrations. The certificate of analysis is provided in **Appendix L-3**.

L.5.2 Quality Assurance/Quality Control

L.5.2.1 QA/QC Methods

See **Section 3.2** for discussion of laboratory QA/QC method types.

Samples were collected according to standard care and QA/QC procedures:

- Samples were labelled with sample ID and date and placed in a cooler with ice in the field. Samples were refrigerated until shipping to ALS laboratory in an ice-filled cooler.
- Gloved hands were used for handling the fillet and care was taken to avoid introducing foreign particles with the fillet.
- The equipment (fillet knife and cutting board) were washed with phosphate-free cleaning detergent and site water and wiped dry with paper towel between samples. Nitrile gloves were also changed between samples.

Seventeen (17) lake trout tissue samples from the Whale Tail Lake fish-out and eight samples from Lake 8 were analyzed in January 2020. Field quality control samples in 2018 consisted of collecting a field duplicate for mercury analysis. DQOs for field duplicate is a Relative percent difference (RPD) between original and duplicate sample of <40% when concentrations are higher than 10x MDL.

Laboratory quality controls included laboratory duplicates, CRM recovery, and average MS and MSD recovery.

L.5.2.2 QA/QC Results

Laboratory QA/QC results for the fish tissue mercury sample are included in the lab data report in **Appendix L-3.** The 2018 field duplicate for fish tissue exceeded the DQO by a small margin when comparing the wet weight measurements (RPD = -40% and >10x MDL) but when comparing the dw measurements (no 78% moisture conversion) the DQO is met (RPD = -34%). All laboratory QC tests for tissue analyses met DQOs. Laboratory duplicates tested for total mercury had an average RDP = 2%. Average CRM recovery was 100%, average MS recovery was 106%, and average MS RDP = 1%.

L.5.3 Lake Trout Tissue Mercury Data

Summary meristic data and total mercury tissue concentrations for lake trout captured in 2018 (Whale Tail Lake and Lake 8) as well as 2015 (Whale Tail Lake and MAM) are presented in **Table L5-1**. Meristic and chemistry data from lake trout captured for the Whale Tail Pit Project as well as fish captured for programs at Meadowbank are provided in **Appendix L-4**.

Lake trout caught from Whale Tail Lake during the baseline period in 2015 were larger on average than fish captured during the baseline fish-out in 2018. Consequently, given the known strong relationship between fish size and tissue mercury concentrations, little emphasis should be placed on the mean mercury concentrations reported in **Table L5-1**. Once the 2020 post-impoundment data are available a quantitative assessment of size-mercury relationships will be conducted for all data to remove the size bias noted above.

Table L5-1. Lake trout meristic data and mercury concentrations in muscle tissue, 2015 and 2018.

Lake	Year	Length (mm)	Weight (g)	Condition (K)	Age-Otolith (yrs)	Age-Fin Ray (yrs)	Hg (ppm ww)
WTL	2015	n=21; 469 (159-860)	n=21; 1412 (37.4-7320)	n=21; 1.05 (0.86-1.28)	n=20; 21 (9-44)	n=21; 18 (4-39)	n=21; 0.505 (0.0771-2.19)
WTL	2018	n=17; 367 (225-570)	n=17; 641 (150-1900)	n=17; 1.13 (0.84-1.48)	n=0; NA (NA)	n=0; NA (NA)	n=17; 0.248 (0.07-0.498)
MAM	2015	n=25; 360 (215-700)	n=25; 661 (96.2-4670)	n=25; 1.07 (0.91-1.36)	n=23; 12 (5-37)	n=25; 11 (5-32)	n=25; 0.209 (0.0722-1.07)
Lake 8	2018	n=8; 431 (204-583)	n=8; 988 (83.3-1980)	n=8; 0.99 (0.72-1.13)	n=0; NA (NA)	n=0; NA (NA)	n=8; 0.428 (0.084-1.162)

Note: 1. Cells contain sample size (n), followed by the mean (range) for all metrics.
2. NA = not available (age data were not available for the 2018 lake trout samples at the time of the report preparation).

L.6 REFERENCES

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APPENDICES

APPENDIX L-1
CERTIFICATE OF ANALYSIS – 2019 MERCURY WATER CHEMISTRY RESULTS

University of Western Ontario - Analytical Services

Date submitted: 4-Nov-19

Heidi Swanson

Client COC:

University of Waterloo
200 University Ave W.
Waterloo, Ontario

Report ID: 2019-11-006

Via email : heidi.swanson@uwaterloo.ca

CERTIFICATE OF ANALYSIS

Sample type & number of samples: 15 aqueous samples

THg (Tekran model 2600)

1. R^2: > 0.9975
2. RPD in Sample Duplicates avg: 2 %
3. IPR & OPR avg: 98 & 100 %
4. % Recovery MS & MSD avg: 94 % & 92 %
5. RPD in MS & MSD avg: 1 %

MeHg (Tekran model 2700) Water

1. R^2: > 0.9950
2. RPD in Sample Duplicates ave: 11 %
3. IPR & OPR avg: 100 & 97 %
4. % Recovery MS & MSD avg: 100 % & 100 %
5. RPD in MS & MSD avg: 0 %
6. % Recovery of QCS avg: 93 %

ACRONYMS:
R2: Coefficient of determination, **MS**: Matrix spike, **MSD**: Matrix spike duplicate, **RPD**: Relative percentage difference, **IPR** & **OPR**: initial & on-going precision & recovery, **QCS**: Quality Control Sample, **MDL**: Method detection limit, **MRL**: Method reporting limit

Notes: *Calculations for MDL and MRL have been revised to comply with EPA MDL revision 2 (Dec 2016). As a result, these values are different than those reported prior to Feb, 2018. Please contact the lab if further information is required. Reporting limit is set to MRL. Summarized QA/QC available upon request.*

COMMENTS REGARDING THIS REPORT: None.

x_____

Wen Xu

Lab Supervisor / Quality Manager

Date: 29-Nov-19

Client Name: **Heidi Swanson**
University of Waterloo

Biotron WO#: 2019-11-006
Report date: 29-Nov-2019

Total Mercury (THg) - Analytical Results

Analytical Method: TM.0811

Sample ID	Lab ID	Prep Code	Date Collected	Analysis Period	Parameter Code	Sample Vol (L)	THg (ng)	Concentration (ng/L)
A76-WQ01-UF	1	n/a	15-Aug-19	14-Nov-19	Total Hg	0.025	0.329	13.18
A76-WQ02-UF	2	n/a	15-Aug-19	14-Nov-19	Total Hg	0.025	0.382	15.26
A20-WQ01-UF	3	n/a	16-Aug-19	14-Nov-19	Total Hg	0.025	0.431	17.23
A20-WQ02-UF	4	n/a	16-Aug-19	14-Nov-19	Total Hg	0.025	0.372	14.87
LK8-WQ01-UF	5	n/a	16-Aug-19	14-Nov-19	Total Hg	0.025	0.365	14.60
LK8-WQ02-UF	6	n/a	16-Aug-19	14-Nov-19	Total Hg	0.025	0.357	14.26
DS1-WQ01-UF	7	n/a	17-Aug-19	14-Nov-19	Total Hg	0.025	0.369	14.77
DS1-WQ02-UF	8	n/a	17-Aug-19	14-Nov-19	Total Hg	0.025	0.375	15.01
WTL-WQ01-UF	9	n/a	18-Aug-19	14-Nov-19	Total Hg	0.025	0.453	18.11
WTL-WQ02-UF	10	n/a	18-Aug-19	14-Nov-19	Total Hg	0.025	0.446	17.82
A65-WQ01-UF	11	n/a	19-Aug-19	14-Nov-19	Total Hg	0.025	0.427	17.08
A65-WQ02A-UF	12	n/a	19-Aug-19	14-Nov-19	Total Hg	0.025	0.420	16.81
A65-WQ02B-UF	13	n/a	19-Aug-19	14-Nov-19	Total Hg	0.025	0.441	17.62
MMT-WQ01-UF	14	n/a	20-Aug-19	14-Nov-19	Total Hg	0.025	0.436	17.45
MMT-WQ02-UF	15	n/a	20-Aug-19	14-Nov-19	Total Hg	0.025	0.382	15.28
MDL							0.002	
MRL							0.005	

NA : Not Available

Comments: The above listed parameters are currently on the reporting laboratory's scope of accreditation. Values < MRL are solely left to the discretion of the client.

APPENDIX L-2
CERTIFICATE OF ANALYSIS – 2018 MERCURY WATER CHEMISTRY RESULTS

Date submitted: 15-Feb-19

Jared Ellenor

Client COC:

University of Waterloo
200 University Ave W.
Waterloo, Ontario

Via email : jared.ellenor@gmail.com

Report ID: 2019-02-008

CERTIFICATE OF ANALYSIS

Sample type & number of samples: 48 water samples

The following analytical analyses were requested: Total mercury and Methyl mercury

THg (Tekran model 2600)

1. R^2: > 0.9975
2. RPD in Sample Duplicates avg: 7 %
3. IPR & OPR avg: 98 & 109 %
4. % Recovery MS & MSD avg: 113 % & 112 %
5. RPD in MS & MSD avg: 2 %

MeHg (Tekran model 2700) Water

1. R^2: > 0.9950
2. RPD in Sample Duplicates avg: 19 %
3. IPR & OPR avg: 97 & 98 %
4. % Recovery MS & MSD avg: 83 % & 84 %
5. RPD in MS & MSD avg: 4 %

ACRONYMS:
R2: Coefficient of determination, **MS**: Matrix spike, **MSD**: Matrix spike duplicate, **RPD**: Relative percentage difference, **IPR** & **OPR**: initial & on-going precision & recovery, **QCS**: Quality Control Sample, **MDL**: Method detection limit, **MRL**: Method reporting limit

Notes: *Calculations for MDL and MRL have been revised to comply with EPA MDL revision 2 (Dec 2016). As a result, these values are different than those reported prior to Feb, 2018. Please contact the lab if further information is required. Reporting limit is set to MRL. Summarized QA/QC available upon request.*

COMMENTS REGARDING THIS REPORT: **A)** Samples in THg analysis have passed the EPA method 1631 recommended holding time (90 days). **B)** In THg analysis, filtered samples (lab ID 2, 6, 10, 38, 40 and 48) are higher than their counterparts (lab ID1, 5, 9, 37, 39 and 47). However, samples 1&2, 37&38, 39&40 and 47&48 are not significantly difference (%RPD < 20%). Samples 5&6 and 9&10 were re-run and there is no matric effect.

x_____

Wen Xu

Lab Supervisor / Quality Manager

Date: 15-Mar-19

Client Name: **Jared Ellenor**
University of Waterloo

Biotron WO#: 2019-02-008
Report date: 15-Mar-2019

Total Mercury (THg) - Analytical Results

Analytical Method: TM.0811

Sample ID	Lab ID	Prep Code	Date Collected	Analysis Period	Parameter Code	Sample Vol (L)	THg (ng)	Concentration (ng/L)
WTL-WQ01-U	1	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.287
WTL-WQ01-F	2	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.321
WTL-WQ02-U	3	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.284
WTL-WQ02-F	4	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.006	0.246
MMT-WQ01-U	5*	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.337
MMT-WQ01-F	6*	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.011	0.428
MMT-WQ02-U	7	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.004	<MRL
MMT-WQ02-F	8	n/a	16-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.289
NEM-WQ01-U	9‡	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.010	0.419
NEM-WQ01-F	10‡	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.017	0.665
NEM-WQ02-U	11	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.009	0.352
NEM-WQ02-F	12	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.004	<MRL
A20-WQ01-U	13	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.012	0.498
A20-WQ01-F	14	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.004	<MRL
A20-WQ02-U	15	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.010	0.407
A20-WQ02-F	16	n/a	17-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.005	<MRL
A76-WQ01-U	17	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.003	<MRL
A76-WQ01-F	18	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.002	<MRL
A76-WQ02-A-U	19	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.001	<MRL
A76-WQ02-A-F	20	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.002	<MRL
A76-WQ02-B-U	21	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.010	0.381
A76-WQ02-B-F	22	n/a	18-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.002	<MRL
A63-WQ01-A-U	23	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.319
A63-WQ01-A-F	24	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.272
A63-WQ01-B-U	25	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.325
A63-WQ01-B-F	26	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.306
A63-WQ02-U	27	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.010	0.385
A63-WQ02-F	28	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.300
A65-WQ01-U	29	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.009	0.364
A65-WQ01-F	30	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.007	0.265

Client Name: **Jared Ellenor**
University of Waterloo

Biotron WO#: 2019-02-008
Report date: 15-Mar-2019

Total Mercury (THg) - Analytical Results

Analytical Method: TM.0811

Sample ID	Lab ID	Prep Code	Date Collected	Analysis Period	Parameter Code	Sample Vol (L)	THg (ng)	Concentration (ng/L)
A65-WQ02-U	31	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.009	0.361
A65-WQ02-F	32	n/a	20-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.006	0.241
LK8-WQ01-U	33	n/a	21-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.003	<MRL
LK8-WQ01-F	34	n/a	21-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.006	0.241
LK8-WQ02-U	35	n/a	21-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.005	<MRL
LK8-WQ02-F	36	n/a	21-Aug-18	Feb 22- Mar 14, 2019	Total Hg	0.025	0.008	0.322
MDL							0.0020	
MRL							0.0050	

NA : Not Available

Comments: The above listed parameters are currently on the reporting laboratory's scope of accreditation. Values < MRL are solely left to the discretion of the client.

APPENDIX L-3
CERTIFICATE OF ANALYSIS – BASELINE MERCURY CONCENTRATIONS IN FISH COLLECTED IN 2018

University of Western Ontario - Analytical Services

Date submitted: 29-Jan-20

Agnico Eagle Mines Limited

Client COC:

Environment Department, Meadowbank
Rouyn-Noranda QC J0Y1C0

Report ID: 2020-01-012

Via email : marie-pier.marcil@agnicoeagle.com; leilan.baxter@agnicoeagle.com; ryan.vanengen@gmail.com

CERTIFICATE OF ANALYSIS

Sample type & number of samples: 67 fish samples
The following analytical analyses were requested: DMA Total mercury

THg (TM 0813, DMA-80)

1. R^2: > 0.995
2. IPR: 99 %
3. RPD in Sample Duplicates avg: 2 %
4. % Recovery CRM avg: 100 %
5. % Recovery MS & MSD avg: 106 %, 106 %
6. RPD in Spike Duplicates avg: 1 %

ACRONYMS:
R2: Coefficient of determination, **MS**: Matrix spike, **MSD**: Matrix spike duplicate, **RPD**: Relative percentage difference, **IPR** & **OPR**: initial & on-going precision & recovery, **MDL**: Method detection limit, **MRL**: Method reporting limit

Notes: *Calculations for MDL and MRL have been revised to comply with EPA MDL revision 2 (Dec 2016). As a result, these values are different than those reported prior to Feb, 2018. Please contact the lab if further information is required. Reporting limit is set to MRL. Summarized QA/QC available upon request.*

COMMENTS REGARDING THIS REPORT: Elevated RPD (40%) when comparing submitted sample duplicates, spike data on 21 and duplicate data on "21-dup" confirm this variability.

x_____

Jeff Warner
Technical Specialist

Date: Wednesday, February 12, 2020

Client Name: **Agnico Eagle Mines Limited** **Biotron WO#:** 2020-01-012

Environment Department, Meadowbank **Report date:** 12-Feb-2020

Total Mercury (THg) by DMA- Analytical Results

Analytical Method: TM.0813

Sample ID	Lab ID	Prep Code	Date Collected	Date analyzed	Parameter Code	Sample Weight (g)	THg from Original Sample (ng)	Concentration (mg/kg)
002-1	1	n/a	8/10/2018	Feb 10-11, 2020	sTHg	0.0204	5.77	0.283
002-3	2	n/a	8/10/2018	Feb 10-11, 2020	sTHg	0.0216	4.96	0.230
003-5	3	n/a	8/10/2018	Feb 10-11, 2020	sTHg	0.0195	8.37	0.429
003-7	4	n/a	8/10/2018	Feb 10-11, 2020	sTHg	0.0208	11.39	0.548
003-9	5	n/a	8/10/2018	Feb 10-11, 2020	sTHg	0.0211	6.05	0.287
31a-4	6	n/a	8/17/2018	Feb 10-11, 2020	sTHg	0.0190	8.88	0.467
500a-7	7	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0199	10.12	0.508
500b-3	8	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0215	13.67	0.636
500A-20	9	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0223	12.34	0.553
500a-18	10	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0196	6.23	0.318
500a-25	11	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0221	15.10	0.683
500b-25	12	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0217	25.79	1.189
500b-27	13	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0228	24.21	1.062
500b-28	14	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0214	7.30	0.341
501A-1	15	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0214	28.16	1.316
501A-5	16	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0215	20.27	0.943
501a-12	17	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0219	19.37	0.885
501b-15	18	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0210	19.37	0.922
501a-19	19	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0203	29.18	1.437
501b-21	20	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0238	26.02	1.093
501B-21 dup	21	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0223	36.75	1.648
502A-1	22	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0210	11.55	0.550
502b-5	23	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0262	28.39	1.083
502a-9	24	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0223	6.76	0.303
502a-11	25	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0220	15.03	0.683
502A-14	26	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0203	8.62	0.425
502A-15	27	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0207	33.02	1.595
502A-16	28	n/a	8/13/2018	Feb 10-11, 2020	sTHg	0.0180	14.77	0.821
503A-19	29	n/a	14-Aug-18	Feb 10-11, 2020	sTHg	0.0210	10.68	0.509
513A-1	30	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0214	17.46	0.816
519a-14	31	n/a	18-Aug-18	Feb 10-11, 2020	sTHg	0.0217	24.66	1.137
522-4	32	n/a	18-Aug-18	Feb 10-11, 2020	sTHg	0.0223	10.58	0.475
524-3	33	n/a	19-Aug-18	Feb 10-11, 2020	sTHg	0.0221	11.29	0.511
531-2	34	n/a	20-Aug-18	Feb 10-11, 2020	sTHg	0.0181	280.61	15.504
1000-1	35	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0225	6.33	0.281
1000-13	36	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0205	35.95	1.754
1001-7	37	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0211	5.73	0.272
1001-12	38	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0235	7.76	0.330
1001-14	39	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0222	7.39	0.333
1002-3	40	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0216	4.66	0.216
1002-4	41	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0219	7.43	0.339
1002-7	42	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0209	4.39	0.210

Client Name: **Agnico Eagle Mines Limited** **Biotron WO#:** 2020-01-012

Environment Department, Meadowbank **Report date:** 12-Feb-2020

Total Mercury (THg) by DMA- Analytical Results

Analytical Method: TM.0813

Sample ID	Lab ID	Prep Code	Date Collected	Date analyzed	Parameter Code	Sample Weight (g)	THg from Original Sample (ng)	Concentration (mg/kg)
1002-8	43	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0210	5.46	0.260
1002-10	44	n/a	10-Aug-18	Feb 10-11, 2020	sTHg	0.0234	27.03	1.155
1003-2	45	n/a	11-Aug-18	Feb 10-11, 2020	sTHg	0.0218	33.92	1.556
1005-9	46	n/a	11-Aug-18	Feb 10-11, 2020	sTHg	0.0213	26.36	1.237
1009a-1	47	n/a	14-Aug-18	Feb 10-11, 2020	sTHg	0.0215	48.65	2.263
1020A-2	48	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0213	20.95	0.983
1020A-3	49	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0201	7.97	0.397
1020A-4	50	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0224	5.48	0.245
1020b-7	51	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0221	8.83	0.400
1021-7	52	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0233	11.20	0.481
1024-3	53	n/a	16-Aug-18	Feb 10-11, 2020	sTHg	0.0209	23.31	1.115
1024-11	54	n/a	17-Aug-18	Feb 10-11, 2020	sTHg	0.0237	7.88	0.333
1027-5	55	n/a	17-Aug-18	Feb 10-11, 2020	sTHg	0.0230	9.22	0.401
1032-1	56	n/a	18-Aug-18	Feb 10-11, 2020	sTHg	0.0206	8.83	0.428
1038A-5	57	n/a	20-Aug-18	Feb 10-11, 2020	sTHg	0.0217	5.31	0.245
1057-8	58	n/a	25-Aug-18	Feb 10-11, 2020	sTHg	0.0219	21.74	0.993
1075-6	59	n/a	27-Aug-18	Feb 10-11, 2020	sTHg	0.0211	3.24	0.154
14241	60	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0216	13.25	0.613
14242	61	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0197	72.48	3.679
14243	62	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0211	21.62	1.025
14244	63	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0227	53.20	2.343
14245	64	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0214	32.22	1.506
14246	65	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0193	101.94	5.282
14247	66	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0224	8.57	0.383
14248	67	n/a	22-Aug-18	Feb 10-11, 2020	sTHg	0.0192	14.15	0.737
MDL							0.07	
MRL							0.22	

NA : Not Available

Comments: The above listed parameters are currently on the reporting laboratory's scope of accreditation.

Values < MRL are solely left to the discretion of the client. Final results significant to 3 digits.

APPENDIX L-4
WHALE TAIL PIT LARGE-BODIED FISH DATABASE

Year	Lake	Fish number	Species code	Species	Fork Length (mm)	Weight (g)	Sex	Maturity	Reproductive Status	Fin-ray age	Otolith age	Sample ID	Lab Sample ID	Moisture (%)	Tissue Hg (mg/kg dw)	Tissue Hg (mg/kg ww)
2018	Lake 8	14241	LKTR	lake trout	375	596	F	I		na	archived		60	0.78	0.613	0.135
2018	Lake 8	14242	LKTR	lake trout	583	1980	M	U		na	archived		61	0.78	3.679	0.809
2018	Lake 8	14243	LKTR	lake trout	491	1170	F	U		na	archived		62	0.78	1.025	0.225
2018	Lake 8	14244	LKTR	lake trout	490	1320	M	G		na	archived		63	0.78	2.343	0.516
2018	Lake 8	14245	LKTR	lake trout	480	1210	F	G		na	archived		64	0.78	1.506	0.331
2018	Lake 8	14246	LKTR	lake trout	582	1410	F	U		na	archived		65	0.78	5.282	1.162
2018	Lake 8	14247	LKTR	lake trout	204	83.3	M	I		na	archived		66	0.78	0.383	0.084
2018	Lake 8	14248	LKTR	lake trout	246	134.7	M	I		na	archived		67	0.78	0.737	0.162
2018	WT-N	1000-13	LKTR	lake trout	390	600	M	IM	GR	na	archived	1000	36	0.78	1.754	0.386
2018	WT-N	1002-10	LKTR	lake trout	490	1350	F	MA	RI	na	archived	1002	44	0.78	1.155	0.254
2018	WT-N	1003-2	LKTR	lake trout	395	600	F	MA	RI	na	archived	1003	45	0.78	1.556	0.342
2018	WT-N	1005-9	LKTR	lake trout	304	300	F	IM	GR	na	archived	1005	46	0.78	1.237	0.272
2018	WT-N	1009a-1	LKTR	lake trout	570	1900	M	MA	RI	na	archived	1009a	47	0.78	2.263	0.498
2018	WT-N	500a-18	LKTR	lake trout	225	150	M	IM	GR	na	archived	500a	10	0.78	0.318	0.070
2018	WT-N	500a-7	LKTR	lake trout	260	200	M	IM	GR	na	archived	500a	7	0.78	0.508	0.112
2018	WT-N	500b-27	LKTR	lake trout	375	600	F	MA	RI	na	archived	500b	13	0.78	1.062	0.234
2018	WT-N	500b-3	LKTR	lake trout	295	300	F	IM	GR	na	archived	500b	8	0.78	0.636	0.140
2018	WT-N	501A-1	LKTR	lake trout	440	800	M	IM	GR	na	archived	501a	15	0.78	1.316	0.289
2018	WT-N	501a-12	LKTR	lake trout	272	250	M	IM	GR	na	archived	501a	17	0.78	0.885	0.195
2018	WT-N	501a-19	LKTR	lake trout	390	825	M	MA	RI	na	archived	501a	19	0.78	1.437	0.316
2018	WT-N	501b-21	LKTR	lake trout	355	375	F	IM	GR	na	archived	501b	20	0.78	1.093	0.240
2018	WT-N	501B-21 dup	LKTR	lake trout	355	375	F	IM	GR	na	archived	501b	21	0.78	1.648	0.363
2018	WT-N	502A-1	LKTR	lake trout	300	400	F	IM	GR	na	archived	502a	22	0.78	0.550	0.121
2018	WT-N	502a-11	LKTR	lake trout	403	800	M	MA	RI	na	archived	502a	25	0.78	0.683	0.150
2018	WT-N	502A-15	LKTR	lake trout	480	1200	M	MA	RI	na	archived	502a	27	0.78	1.595	0.351
2018	WT-N	502b-5	LKTR	lake trout	300	250	F	IM	GR	na	archived	502b	23	0.78	1.083	0.238
2015	WT	46	LKTR	lake trout	568	1830	f	m		28	28	WHALE TAIL LAKE LAKE TROUT 46	L1677176-1	80.4	3.01	0.59
2015	WT	47	LKTR	lake trout	661	3110	m	m		26	24	WHALE TAIL LAKE LAKE TROUT 47	L1677176-2	78.3	3.84	0.831
2015	WT	48	LKTR	lake trout	581	2210	f	m		25	27	WHALE TAIL LAKE LAKE TROUT 48	L1677176-3	79.1	4.13	0.863
2015	WT	49	LKTR	lake trout	608	2230	f	m		25	26	WHALE TAIL LAKE LAKE TROUT 49	L1677176-4	80.1	4.84	0.965
2015	WT	50	LKTR	lake trout	481	1090	m	i		24	25	WHALE TAIL LAKE LAKE TROUT 50	L1677176-5	78.4	2.2	0.474
2015	WT	52	LKTR	lake trout	445	1130	m	m		15	15	WHALE TAIL LAKE LAKE TROUT 52	L1677176-6	69.6	0.444	0.135
2015	WT	53	LKTR	lake trout	472	970	m	i		18	18	WHALE TAIL LAKE LAKE TROUT 53	L1677176-7	78.5	1.71	0.368
2015	WT	56	LKTR	lake trout	407	775	m	m		16	23	WHALE TAIL LAKE LAKE TROUT 56	L1677176-10	74.8	1.3	0.328
2015	WT	57	LKTR	lake trout	388	607	m	m		12	13	WHALE TAIL LAKE LAKE TROUT 57	L1677176-11	72.7	1.03	0.281
2015	WT	58	LKTR	lake trout	469	987	m	i		14	18	WHALE TAIL LAKE LAKE TROUT 58	L1677176-12	75.3	1.49	0.37
2015	WT	59	LKTR	lake trout	380	655	m	m		11	12	WHALE TAIL LAKE LAKE TROUT 59	L1677176-13	76	0.727	0.175
2015	WT	60	LKTR	lake trout	430	687	f	m		12	13	WHALE TAIL LAKE LAKE TROUT 60	L1677176-14	78.7	2.13	0.453
2015	WT	61	LKTR	lake trout	860	7320	m	m		39	44	WHALE TAIL LAKE LAKE TROUT 61	L1677176-15	77	9.52	2.19
2015	WT	62	LKTR	lake trout	585	2110	m	m		22	26	WHALE TAIL LAKE LAKE TROUT 62	L1677176-16	77.3	3.52	0.798
2015	WT	63	LKTR	lake trout	475	1020	m	m		20	25	WHALE TAIL LAKE LAKE TROUT 63	L1677176-17	77.1	2.12	0.486
2015	WT	64	LKTR	lake trout	410	745	f	m		22	25	WHALE TAIL LAKE LAKE TROUT 64	L1677176-18	78.6	1.36	0.292
2015	WT	65	LKTR	lake trout	423	693	f	m		11	14	WHALE TAIL LAKE LAKE TROUT 65	L1677176-19	75.7	1.26	0.306
2015	WT	66	LKTR	lake trout	335	427	m	i		11	12	WHALE TAIL LAKE LAKE TROUT 66	L1677176-20	77.5	0.614	0.138

Year	Lake	Fish number	Species code	Species	Fork Length (mm)	Weight (g)	Sex	Maturity	Reproductive Status	Fin-ray age	Otolith age	Sample ID	Lab Sample ID	Moisture (%)	Tissue Hg (mg/kg dw)	Tissue Hg (mg/kg ww)
2015	WT	68	LKTR	lake trout	319	348	m	i		9	9	WHALE TAIL LAKE LAKE TROUT 68	L1677176-21	77.8	0.711	0.158
2015	WT	69	LKTR	lake trout	159	37.4	u	i		4	na	WHALE TAIL LAKE LAKE TROUT 69	L1677176-22	76.9	0.334	0.0771
2015	WT	70	LKTR	lake trout	390	672	f	r		15	19	WHALE TAIL LAKE LAKE TROUT 70	L1677176-23	75.3	1.29	0.318
2015	MAM	97	LKTR	lake trout	370	510	f	m		13	13	MAMMOTH LAKE LAKE TROUT 97	L1677176-24	74.8	0.902	0.227
2015	MAM	98	LKTR	lake trout	369	501	f	m		12	13	MAMMOTH LAKE LAKE TROUT 98	L1677176-25	75.1	0.625	0.156
2015	MAM	99	LKTR	lake trout	373	550	f	m		9	11	MAMMOTH LAKE LAKE TROUT 99	L1677176-26	76	0.655	0.157
2015	MAM	100	LKTR	lake trout	363	542	m	m		9	na	MAMMOTH LAKE LAKE TROUT 100	L1677176-27	74.8	0.504	0.127
2015	MAM	101	LKTR	lake trout	343	460	f	m		9	9	MAMMOTH LAKE LAKE TROUT 101	L1677176-28	75.9	0.566	0.136
2015	MAM	102	LKTR	lake trout	353	433	f	m		9	10	MAMMOTH LAKE LAKE TROUT 102	L1677176-29	76.1	0.578	0.138
2015	MAM	103	LKTR	lake trout	373	474	f	m		13	16	MAMMOTH LAKE LAKE TROUT 103	L1677176-30	75.7	0.739	0.18
2015	MAM	105	LKTR	lake trout	385	612	f	m		10	11	MAMMOTH LAKE LAKE TROUT 105	L1677176-31	75.4	0.7	0.172
2015	MAM	106	LKTR	lake trout	395	692	f	m		11	12	MAMMOTH LAKE LAKE TROUT 106	L1677176-32	80	1.34	0.268
2015	MAM	108	LKTR	lake trout	351	474	m	m		8	na	MAMMOTH LAKE LAKE TROUT 108	L1677176-33	77.4	0.531	0.12
2015	MAM	110	LKTR	lake trout	346	478	f	m		9	10	MAMMOTH LAKE LAKE TROUT 110	L1677176-34	74	0.602	0.156
2015	MAM	111	LKTR	lake trout	365	504	m	m		12	12	MAMMOTH LAKE LAKE TROUT 111	L1677176-35	75.9	0.785	0.189
2015	MAM	112	LKTR	lake trout	365	504	f	m		13	13	MAMMOTH LAKE LAKE TROUT 112	L1677176-36	74.8	0.693	0.175
2015	MAM	114	LKTR	lake trout	590	2110	m	m		24	24	MAMMOTH LAKE LAKE TROUT 114	L1677176-37	80	2.91	0.583
2015	MAM	115	LKTR	lake trout	369	511	m	m		12	12	MAMMOTH LAKE LAKE TROUT 115	L1677176-38	77.2	0.572	0.13
2015	MAM	116	LKTR	lake trout	354	472	m	m		12	13	MAMMOTH LAKE LAKE TROUT 116	L1677176-39	77	0.811	0.187
2015	MAM	117	LKTR	lake trout	366	534	m	i		13	13	MAMMOTH LAKE LAKE TROUT 117	L1677176-40	74.6	0.845	0.215
2015	MAM	118	LKTR	lake trout	316	319	m	i		10	10	MAMMOTH LAKE LAKE TROUT 118	L1677176-41	77.8	0.986	0.219
2015	MAM	119	LKTR	lake trout	290	269	m	i		8	8	MAMMOTH LAKE LAKE TROUT 119	L1677176-42	75.4	0.523	0.129
2015	MAM	120	LKTR	lake trout	290	287	f	i		8	8	MAMMOTH LAKE LAKE TROUT 120	L1677176-43	75.3	0.492	0.122
2015	MAM	121	LKTR	lake trout	285	239	u	i		8	8	MAMMOTH LAKE LAKE TROUT 121	L1677176-44	74.6	0.531	0.135
2015	MAM	122	LKTR	lake trout	254	181	u	i		6	6	MAMMOTH LAKE LAKE TROUT 122	L1677176-45	76.1	0.325	0.0777
2015	MAM	123	LKTR	lake trout	215	96.2	u	i		5	5	MAMMOTH LAKE LAKE TROUT 123	L1677176-46	78	0.34	0.0747
2015	MAM	124	LKTR	lake trout	700	4670	f	m		32	37	MAMMOTH LAKE LAKE TROUT 124	L1677176-47	78.7	4.99	1.07
2015	MAM	126	LKTR	lake trout	218	111	u	i		6	5	MAMMOTH LAKE LAKE TROUT 126	L1677176-48	78.1	0.329	0.0722
1998	Pipe Dream	203	LKTR	lake trout	915	7050	F	3			37	98Pipe-5				1.48
1998	Pipe Dream	138	LKTR	lake trout	726	3925	M	10			30+	98Pipe-2				1.2
1998	Pipe Dream	123	LKTR	lake trout	586	2075	F	2			22	98Pipe-1				0.44
1998	INUG	251	LKTR	lake trout	590	2175	F	5			26	98Aqun-1				0.32
1998	AMARULIK	431	LKTR	lake trout	665	3125	M	6			23	98Amar-1				0.57
1998	FARSIDE	932	LKTR	lake trout	602	2350	F	5			17	98last-2				0.46
1998	FARSIDE	997	LKTR	lake trout	619	2650	M	8			28	98last-5				0.41
1998	INUG	272	LKTR	lake trout	563	2025	M	6			21	98Aqun-2				0.31
1998	AMARULIK	554	LKTR	lake trout	786	5600	M	8			24	98Amar-4				0.69
1998	INUG	300	LKTR	lake trout	660	3350	F	3				98Aqun-3				0.5
1998	FARSIDE	906	LKTR	lake trout	700	4200	F	5			26	98last-1				0.74
1998	FARSIDE	995	LKTR	lake trout	670	3700	M	6			24	98last-5				0.57
1998	AMARULIK	465	LKTR	lake trout	749	5225	F	3				98Amar-2				0.74
1998	INUG	250	LKTR	lake trout	620	2975	M	8			22	98Aqun-1				0.42
1998	INUG	273	LKTR	lake trout	845	7625	F	5			32	98Aqun-2				1.03
1998	Pipe Dream	194	LKTR	lake trout	641	3450	M	8				98Pipe-4				0.61

Year	Lake	Fish number	Species code	Species	Fork Length (mm)	Weight (g)	Sex	Maturity	Reproductive Status	Fin-ray age	Otolith age	Sample ID	Lab Sample ID	Moisture (%)	Tissue Hg (mg/kg dw)	Tissue Hg (mg/kg ww)
1998	FARSIDE	964	LKTR	lake trout	610	2975	F	3				98last-3				0.69
1998	Pipe Dream	126	LKTR	lake trout	518	2050	F	2			19	98Pipe-1				0.26
1998	AMARULIK	551	LKTR	lake trout	832	8575	M	8			28	98Amar-4				0.74
1998	AMARULIK	410	LKTR	lake trout	305	5800	F	5			40	98Amar-1				0.84
1997	TP	62	LKTR	lake trout	686	2875	M	10				973PN-6				0.506
1997	SP	17	LKTR	lake trout	545	1450	F	5			21	972P-1				0.376
1997	TEHEK	45	LKTR	lake trout	523	1400	F	1			18	97T-4				0.218
1997	TEHEK	62	LKTR	lake trout	646	2650	F	5			35+	97T-3				0.523
1997	TP	73	LKTR	lake trout	715	3800	M	10			38 ?	973PN-7				0.538
1997	TP	53	LKTR	lake trout	544	1700	F	5			18	973PN-6				0.209
1997	TP	83	LKTR	lake trout	493	1275	F	1			16	973PS-8				0.095
1997	TP	64	LKTR	lake trout	560	1900	F	5			22	973PN-7				0.211
1997	SP	91	LKTR	lake trout	585	2225	M	6			21	972P-4				0.37
1997	SP	95	LKTR	lake trout	545	1800	M	6			16	972P-4				0.4
1997	SP	73	LKTR	lake trout	822	6300	F	5				972P-3				1.17
1997	TP	49	LKTR	lake trout	612	2625	F	3				973PN-6				0.601
1997	SP	39	LKTR	lake trout	513	1550	F	3			26	972P-2				0.71
1997	TP	42	LKTR	lake trout	572	2150	F	2			18	973PN-5				0.093
1997	TEHEK	63	LKTR	lake trout	590	2575	M	8			20	97T-3				0.2
1997	SP	57	LKTR	lake trout	463	1325	F	2			19	972P-4				0.269
1997	TP	61	LKTR	lake trout	563	2425	F	3			23	973PN-6				0.307

Notes
Otolith age data from fish collected in 2018 were archived when the 2019 Mercury Monitoring Program Report was prepared.