

ANNEX XI: APPENDIX F SEDIMENT QUALITY DATA

Tables

Table F-1	Sediment Quality Data From Lac du Sauvage During the Open-Water Period, 2013.....	1
Table F-2	Sediment Quality Data From Duchess Lake During the Open-Water Period, 2013.....	5
Table F-3	Sediment Quality Data From Lake Af1 During the Open-Water Period, 2013	7
Table F-4	Sediment Quality Data From Sub-Basin Lakes During the Open-Water Period, 2013.....	9
Table F-5	Sediment Quality Data From Lake E1 During the Open-Water Period, 2013	11
Table F-6	Sediment Quality Data From Paul Lake During the Open-Water Period, 2013	13
Table F-7	Sediment Quality Data From Lac du Sauvage Outlet (Ab-S1) During the Open-Water Period, 2013	15
Table F-8	Sediment Quality Data From Sub-Basin Streams During the Open-Water Period, 2013.....	17

Abbreviations

Abbreviation	Definition
—	no guideline or data
ISQG	Interim Sediment Quality Guideline
Max	maximum
Min	minimum
NAD	North American Datum
PEL	probable effects level
pH	potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14

Units of Measure

Unit	Definition
%	percent
>	greater than
<	less than
µm	micrometres
m	metre
mg/kg	milligrams per kilogram
mm	millimetre

Table F-1 Sediment Quality Data From Lac du Sauvage During the Open-Water Period, 2013
Part A

Location	Unit	Guidelines for the Protection of Aquatic Life		Lac du Sauvage Sampling Stations													
Sample Name				Aa-1	Aa-2	Ab-1	Ab-2	Ac-1	Ac-2	Ac-4	Ac-5	Ac-7	Ac-8	Ad-1	Ad-2	Ae-1	Ae-2
Sampling Season				Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer
Sample Date				27-Aug-13	27-Aug-13	26-Aug-13	26-Aug-13	25-Aug-13	25-Aug-13	19-Aug-13	19-Aug-13	24-Aug-13	24-Aug-13	17-Aug-13	17-Aug-13	18-Aug-13	16-Aug-13
Easting (NAD 83, 12W)		ISQG	PEL	552282	542589	547766	548215	543339	545832	543695	543149	544247	544777	539898	539868	542494	542589
Northing (NAD 83, 12W)				7165025	7170675	7162266	7161177	7165138	7165447	7162938	7163287	7165068	7165855	7168781	7168991	7170252	7170675
Physical Parameters																	
Depth	m	—	—	11.2	5.0	12.4	5.0	12.8	5.0	12.1	3.5	12.4	4.2	12.6	4.2	12.4	5.3
Organic Matter	%	—	—	1.8	2.6	3.7	3.4	3.0	2.4	3.6	1.7	3.5	2.7	2.2	3.3	2.0	1.9
pH	pH units	—	—	7.1	8.5	6.6	6.2	5.7	6.0	6.4	6.1	6.1	5.7	6.4	6.4	6.3	6.0
Clay Content (<4 µm)	%	—	—	11	10	21	9.0	21	19	22	7.4	21	20	19	15	18	14
Silt Content (4 µm to 0.063 mm)	%	—	—	84	87	78	61	77	73	76	40	78	77	81	84	81	84
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	4.4	2.9	1.2	22	1.5	4.7	2.2	27	1.0	1.6	0.91	0.79	0.29	2.1
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	0.52	0.35	0.11	8.4	0.35	3.1	0.1	22	0.18	1.3	<0.1	0.25	0.11	0.34
Gravel (>2 mm)	%	—	—	<0.1	<0.1	<0.1	0.14	<0.1	0.22	<0.1	3.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nutrients																	
Available Ammonium-N	mg/kg	—	—	13	19	13	14	16	12	14	9.0	14	18	12	51	11	14
Nitrogen, Organic	%	—	—	0.1	0.13	0.15	0.19	0.15	0.12	0.14	0.074	0.14	0.14	0.1	0.2	0.097	0.1
Nitrogen, Total Kjeldahl	%	—	—	0.1	0.14	0.15	0.19	0.16	0.12	0.14	0.075	0.14	0.15	0.1	0.21	0.098	0.11
Phosphate, Available-P	mg/kg	—	—	25	9.7	17	101	11	31	25	19	13	16	21	14	9.2	5.2
Phosphorus	mg/kg	—	—	599	1,030	1,470	511	1,090	1,170	1,850	1,060	1,560	879	725	617	853	1,010
Carbon, Total	%	—	—	1.0	1.3	1.6	1.9	1.5	1.1	1.5	0.8	1.5	1.5	1.0	2.0	1.0	0.9
Carbon, Inorganic	%	—	—	0.14	<0.1	0.22	0.14	0.16	0.15	0.27	<0.1	0.21	0.2	0.14	0.17	0.14	0.12
Carbon, Total Organic	%	—	—	0.84	1.2	1.4	1.7	1.4	0.98	1.2	0.75	1.3	1.3	0.84	1.8	0.76	0.76
CaCO ₃ equivalent	%	—	—	1.2	1.3	1.8	1.8	1.3	1.2	2.2	0.83	1.7	1.6	1.8	1.4	1.8	1.0
Total Metals																	
Aluminum	mg/kg	—	—	11,600	11,900	16,800	14,700	19,000	17,800	17,300	12,200	17,800	19,400	18,200	16,800	17,400	14,900
Antimony	mg/kg	—	—	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Arsenic	mg/kg	5.9	17	4.2	32 ^(b)	196 ^(b)	9.0 ^(a)	73 ^(b)	38 ^(b)	113 ^(b)	32 ^(b)	155 ^(b)	23 ^(b)	26 ^(b)	7.0 ^(a)	81 ^(a)	61 ^(a)
Barium	mg/kg	—	—	83	99	158	120	151	122	178	98	154	144	140	132	143	121
Beryllium	mg/kg	—	—	<0.5	0.51	<0.5	<0.5	0.57	0.51	0.53	<0.5	0.51	0.56	0.53	<0.5	<0.5	<0.5
Bismuth	mg/kg	—	—	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	mg/kg	0.6	3.5	<0.1	<0.1	0.16	0.15	0.16	<0.1	0.19	<0.1	0.2	0.16	<0.1	<0.1	0.13	<0.1
Chromium	mg/kg	37.3	90	45 ^(a)	45 ^(a)	58 ^(a)	59 ^(a)	70 ^(a)	64 ^(a)	72 ^(a)	50 ^(a)	66 ^(a)	69 ^(a)	70 ^(a)	65 ^(a)	62 ^(a)	54 ^(a)
Cobalt	mg/kg	—	—	7.3	12	26	13	20	18	25	12	22	18	17	12	16	16
Copper	mg/kg	35.7	197	26	20	31	27	31	27	36 ^(a)	16	33	29	35	23	23	18
Iron	mg/kg	—	—	16,100	28,600	55,500	21,100	39,800	35,600	48,400	26,600	51,800	33,000	31,600	24,500	34,600	35,000
Lead	mg/kg	35	91.3	3.3	3.7	4.6	4.2	5.1	4.7	4.8	2.9	4.6	5.1	4.7	4.0	4.8	4.1
Lithium	mg/kg	—	—	28	28	38	37	49	46	42	33	41	50	45	45	41	41
Manganese	mg/kg	—	—	199	589	3,490	396	1,010	835	2,080	614	1,720	709	3,160	437	2,330	932
Mercury	mg/kg	0.17	0.486	0.017	0.013	0.024	0.026	0.014	0.0064	0.024	0.031	0.028	0.011	0.036	0.012	0.014	0.0095
Molybdenum	mg/kg	—	—	<1	3.0	3.2	1.1	2.2	1.5	2.6	1.1	3.0	1.5	1.5	<1	3.4	2.0
Nickel	mg/kg	—	—	23	28	43	38	49	38	52	29	48	46	39	35	37	31
Selenium	mg/kg	—	—	<0.2	0.21	0.22	0.21	<0.2	0.21	0.2	0.21	0.21	<0.2	<0.2	<0.2	<0.2	<0.2
Silver	mg/kg	—	—	<0.2	0.21	<0.2	0.21	<0.2	0.21	<0.2	0.21	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Strontium	mg/kg	—	—	10	10	12	11	14	12	13	7.9	12	16	15	15	15	13

Table F-1 Sediment Quality Data From Lac du Sauvage During the Open-Water Period, 2013
Part A

Location	Unit	Guidelines for the Protection of Aquatic Life		Lac du Sauvage Sampling Stations													
Sample Name				Aa-1	Aa-2	Ab-1	Ab-2	Ac-1	Ac-2	Ac-4	Ac-5	Ac-7	Ac-8	Ad-1	Ad-2	Ae-1	Ae-2
Sampling Season				Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer	Summer
Sample Date				27-Aug-13	27-Aug-13	26-Aug-13	26-Aug-13	25-Aug-13	25-Aug-13	19-Aug-13	19-Aug-13	24-Aug-13	24-Aug-13	17-Aug-13	17-Aug-13	18-Aug-13	16-Aug-13
Easting (NAD 83, 12W)		ISQG	PEL	552282	542589	547766	548215	543339	545832	543695	543149	544247	544777	539898	539868	542494	542589
Northing (NAD 83, 12W)				7165025	7170675	7162266	7161177	7165138	7165447	7162938	7163287	7165068	7165855	7168781	7168991	7170252	7170675
Total Metals (Continued)																	
Sulfur	mg/kg	—	—	<500	700	700	600	700	<500	700	<500	700	700	<500	700	<500	<500
Thallium	mg/kg	—	—	0.16	0.19	0.28	0.24	0.31	0.27	0.29	0.17	0.29	0.31	0.27	0.24	0.27	0.23
Tin	mg/kg	—	—	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Titanium	mg/kg	—	—	835	794	859	934	1,150	1,020	1,190	806	1,020	1,250	1,260	1,220	1,150	1,020
Uranium	mg/kg	—	—	1.7	1.8	2.7	2.7	2.9	2.5	2.7	1.6	2.7	2.8	2.3	2.1	2.4	2.2
Vanadium	mg/kg	—	—	36	38	48	47	57	52	60	38	54	57	56	51	51	46
Zinc	mg/kg	123	315	42	44	65	60	75	64	80	44	74	73	69	64	62	55

a) Concentration higher than the ISQG.
b) Concentration higher than the PEL.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-1 Sediment Quality Data From Lac du Sauvage During the Open-Water Period, 2013
Part B

	Unit	Guidelines for the Protection of Aquatic Life		Summary Statistics								
				Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
		ISQG	PEL								ISQG	PEL
Physical Parameters												
Depth	m	—	—	14	3.5	8.4	8.3	12.8	4.0	1.1	—	—
Organic Matter	%	—	—	14	1.7	2.7	2.7	3.7	0.72	0.19	—	—
pH	pH units	—	—	14	5.7	6.4	6.2	8.5	0.71	0.19	—	—
Clay Content (<4 μm)	%	—	—	14	7.4	16	19	22	5.1	1.4	—	—
Silt Content (4 μm to 0.063 mm)	%	—	—	14	40	76	78	87	12	3.2	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	14	0.29	5.2	1.9	27	8.3	2.2	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	14	0.05	2.7	0.33	22	6.0	1.6	—	—
Gravel (>2 mm)	%	—	—	14	<0.1	0.3	<0.1	3.3	0.87	0.23	—	—
Nutrients												
Available Ammonium-N	mg/kg	—	—	14	9.0	16	14	51	10	2.7	—	—
Nitrogen, Organic	%	—	—	14	0.074	0.13	0.14	0.2	0.035	0.0094	—	—
Nitrogen, Total Kjeldahl	%	—	—	14	0.075	0.13	0.14	0.21	0.036	0.0096	—	—
Phosphate, Available-P	mg/kg	—	—	14	5.2	22	16	101	24	6.3	—	—
Phosphorus	mg/kg	—	—	14	511	1,030	1,020	1,850	387	103	—	—
Carbon, Total	%	—	—	14	0.8	1.3	1.4	2.0	0.37	0.10	—	—
Carbon, Inorganic	%	—	—	14	<0.1	0.17	0.16	0.27	0.053	0.014	—	—
Carbon, Total Organic	%	—	—	14	0.75	1.2	1.2	1.8	0.35	0.094	—	—
CaCO ₃ equivalent	%	—	—	14	0.83	1.4	1.3	2.2	0.37	0.10	—	—
Total Metals												
Aluminum	mg/kg	—	—	14	11,600	16,129	17,050	19,400	2,632	704	—	—
Antimony	mg/kg	—	—	14	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Arsenic	mg/kg	5.9	17	14	4.2	61 ^(b)	35 ^(b)	196 ^(b)	58	16	93	79
Barium	mg/kg	—	—	14	83	132	136	178	26	7.0	—	—
Beryllium	mg/kg	—	—	14	<0.5	0.37	<0.5	0.57	0.15	0.039	—	—
Bismuth	mg/kg	—	—	14	<1	<1	<1	<1	—	—	—	—
Cadmium	mg/kg	0.6	3.5	14	<0.1	0.11	0.09	0.2	0.061	0.016	0	0
Chromium	mg/kg	37.3	90	14	45 ^(a)	61 ^(a)	63 ^(a)	72 ^(a)	9.2	2.5	100	0
Cobalt	mg/kg	—	—	14	7.3	17	16	26	5.4	1.4	—	—
Copper	mg/kg	35.7	197	14	16	27	27	36 ^(a)	6.1	1.6	7	0
Iron	mg/kg	—	—	14	16,100	34,443	33,800	55,500	11,398	3,046	—	—
Lead	mg/kg	35	91.3	14	2.9	4.3	4.6	5.1	0.66	0.18	0	0
Lithium	mg/kg	—	—	14	28	40	41	50	6.9	1.8	—	—
Manganese	mg/kg	—	—	14	199	1,322	884	3,490	1,061	284	—	—
Mercury	mg/kg	0.17	0.486	14	0.0064	0.019	0.016	0.036	0.009	0.0024	0	0
Molybdenum	mg/kg	—	—	14	<1	1.8	1.5	3.4	0.95	0.25	—	—
Nickel	mg/kg	—	—	14	23	38	38	52	8.7	2.3	—	—

Table F-1 Sediment Quality Data From Lac du Sauvage During the Open-Water Period, 2013
Part B

	Unit	Guidelines for the Protection of Aquatic Life		Summary Statistics								
				Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
		ISQG	PEL								ISQG	PEL
Total Metals (Continued)												
Selenium	mg/kg	—	—	14	<0.2	0.12	<0.2	0.22	0.047	0.013	—	—
Silver	mg/kg	—	—	14	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Strontium	mg/kg	—	—	14	7.9	13	13	16	2.3	0.61	—	—
Sulfur	mg/kg	—	—	14	<500	529	650	1100	274	73	—	—
Thallium	mg/kg	—	—	14	0.16	0.25	0.27	0.31	0.049	0.013	—	—
Tin	mg/kg	—	—	14	<2	<2	<2	<2	—	—	—	—
Titanium	mg/kg	—	—	14	794	1,036	1,020	1,260	170	45	—	—
Uranium	mg/kg	—	—	14	1.6	2.4	2.4	2.9	0.42	0.11	—	—
Vanadium	mg/kg	—	—	14	36	49	51	60	7.7	2.0	—	—
Zinc	mg/kg	123	315	14	42	62	64	80	12	3.3	0	0

a) Concentration higher than the ISQG.
b) Concentration higher than the PEL.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-2 Sediment Quality Data From Duchess Lake During the Open-Water Period, 2013

	Unit	Guidelines for the Protection of Aquatic Life		Duchess Lake Sampling Stations				Summary Statistics								
Location				Af-1	Af-2	Af-4	Af-7	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
Sampling Season				Summer	Summer	Summer	Summer								ISQG	PEL
Sample Date				21-Aug-13	20-Aug-13	20-Aug-13	20-Aug-13									
Easting (NAD 83, 12W)				542155	542074	544360	541367									
Northing (NAD 83, 12W)				7173731	7173542	7173181	7174902									
Physical Parameters																
Organic Matter	%	—	—	2.4	2.3	2.5	2.3	4	2.3	2.4	2.4	2.5	0.1	0.05	—	—
pH	pH units	—	—	6.2	5.9	5.7	5.4	4	5.4	5.8	5.8	6.2	0.4	0.2	—	—
Clay Content (<4 µm)	%	—	—	18	17	13	14	4	13	15	15	18	2.72	1.4	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	81	81	82	84	4	81	82	82	84	1.7	0.8	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	0.92	1.3	4.6	2.0	4	0.9	2.2	1.7	4.6	1.6	0.8	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	0.25	0.11	0.37	0.12	4	0.11	0.21	0.19	0.37	0.12	0.061	—	—
Gravel (>2 mm)	%	—	—	<0.1	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Nutrients																
Available Ammonium-N	mg/kg	—	—	20	11	18	18	4	11	17	18	20	4.1	2.0	—	—
Nitrogen, Organic	%	—	—	0.13	0.09	0.15	0.12	4	0.09	0.12	0.13	0.15	0.024	0.012	—	—
Nitrogen, Total Kjeldahl	%	—	—	0.13	0.091	0.15	0.13	4	0.091	0.13	0.13	0.15	0.025	0.012	—	—
Phosphate, Available-P	mg/kg	—	—	27	21	12	11	4	11	17	16	27	7.6	3.8	—	—
Phosphorus	mg/kg	—	—	692	1,640	585	882	4	585	950	787	1640	476	238	—	—
Carbon, Total	%	—	—	1.2	0.9	1.4	1.2	4	0.9	1.2	1.2	1.4	0.21	0.1	—	—
Carbon, Inorganic	%	—	—	<0.1	0.18	0.13	<0.1	4	<0.1	0.1	0.09	0.18	0.064	0.032	—	—
Carbon, Total Organic	%	—	—	1.2	0.75	1.3	1.2	4	0.75	1.1	1.2	1.3	0.25	0.12	—	—
CaCO ₃ equivalent	%	—	—	0.82	1.5	1.1	0.82	4	0.82	1.1	0.95	1.5	0.33	0.17	—	—
Total Metals																
Aluminum	mg/kg	—	—	17,500	17,500	16,100	15,500	4	15,500	16,650	16,800	17,500	1,012	506	—	—
Antimony	mg/kg	—	—	<0.1	<0.1	<0.1	<0.1	4	0.05	0.05	0.05	0.05	0	0	—	—
Arsenic	mg/kg	5.9	17	5.7	87 ^(b)	8 ^(a)	17 ^(a)	4	5.7	29 ^(b)	13 ^(a)	87 ^(b)	39	19	75	50
Barium	mg/kg	—	—	128	121	120	119	4	119	122	121	128	4.1	2.0	—	—
Beryllium	mg/kg	—	—	0.51	0.55	<0.5	0.5	4	<0.5	0.45	0.51	0.55	0.14	0.068	—	—
Bismuth	mg/kg	—	—	<1	<1	<1	<1	4	<1.0	<1.0	<1.0	<1.0	—	—	—	—
Cadmium	mg/kg	0.6	3.5	<0.1	<0.1	<0.1	<0.1	4	<0.1	<0.1	<0.1	<0.1	—	—	0	0
Chromium	mg/kg	37.3	90	64 ^(a)	63 ^(a)	62 ^(a)	59 ^(a)	4	59 ^(a)	62 ^(a)	63 ^(a)	64 ^(a)	2.2	1.1	100	0
Cobalt	mg/kg	—	—	12	17	11	12	4	11	13	12	17	2.8	1.4	—	—
Copper	mg/kg	35.7	197	28	21	18	23	4	18	23	22	28	4.5	2.2	0	0
Iron	mg/kg	—	—	24,600	53,700	24,900	28,200	4	24,600	32,850	26,550	53,700	13,995	6,998	—	—
Lead	mg/kg	35	91.3	4.5	4.3	4.0	4.3	4	4.0	4.3	4.3	4.5	0.21	0.1	0	0
Lithium	mg/kg	—	—	45	42	41	42	4	41	42	42	45	1.8	0.9	—	—
Manganese	mg/kg	—	—	286	667	260	277	4	260	373	282	667	197	98	—	—
Mercury	mg/kg	0.17	0.486	0.014	0.0084	0.012	0.02	4	0.0084	0.014	0.013	0.02	0.005	0.0025	0	0
Molybdenum	mg/kg	—	—	<1	3.2	<1	1.6	4	<0.1	1.5	1.1	3.2	1.3	0.64	—	—

Table F-2 Sediment Quality Data From Duchess Lake During the Open-Water Period, 2013

Location		Guidelines for the Protection of Aquatic Life		Duchess Lake Sampling Stations				Summary Statistics								
				Af-1	Af-2	Af-4	Af-7	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
				Summer	Summer	Summer	Summer								ISQG	PEL
				21-Aug-13	20-Aug-13	20-Aug-13	20-Aug-13									
Sampling Season	Unit	ISQG	PEL	542155	542074	544360	541367	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	ISQG	PEL
Sample Date				7173731	7173542	7173181	7174902									
Easting (NAD 83, 12W)				7173731	7173542	7173181	7174902									
Northing (NAD 83, 12W)	7173731	7173542	7173181	7174902												
Total Metals (continued)																
Nickel	mg/kg	—	—	34	32	32	32	4	32	33	32	34	1.2	0.58	—	—
Selenium	mg/kg	—	—	<0.2	<0.2	<0.2	<0.2	4	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Silver	mg/kg	—	—	<0.2	<0.2	<0.2	<0.2	4	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Strontium	mg/kg	—	—	14	13	11	12	4	11	13	12	14	1.2	0.59	—	—
Sulfur	mg/kg	—	—	<500	<500	600	700	4	250	450	425	700	235	117	—	—
Thallium	mg/kg	—	—	0.26	0.25	0.25	0.24	4	0.24	0.25	0.25	0.26	0.0082	0.0041	—	—
Tin	mg/kg	—	—	<2	<2	<2	<2	4	<2.0	<2.0	<2.0	<2.0	—	—	—	—
Titanium	mg/kg	—	—	1,210	1,100	1,130	1,060	4	1,060	1,125	1,115	1,210	64	32	—	—
Uranium	mg/kg	—	—	2.6	2.5	2.3	2.8	4	2.3	2.5	2.5	2.8	0.18	0.089	—	—
Vanadium	mg/kg	—	—	53	52	49	50	4	49	51	51	53	1.9	0.95	—	—
Zinc	mg/kg	123	315	64	62	62	58	4	58	61	62	64	2.6	1.3	0	0

a) Concentration higher than the ISQG.
b) Concentration higher than the PEL.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-3 Sediment Quality Data From Lake Af1 During the Open-Water Period, 2013

Location	Unit	Guidelines for the Protection of Aquatic Life		Lake Af1		
				Af-10	% Above Guideline	
				Fall		
				12-Sep-13		
				538299	ISQG	PEL
Easting (NAD 83, 12W)		ISQG	PEL	7176361		
Northing (NAD 83, 12W)						
Physical Parameters						
Organic Matter	%	—	—	3.4	—	—
pH	pH units	—	—	5.4	—	—
Clay Content (<4 µm)	%	—	—	18	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	81	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	0.23	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	<0.1	—	—
Gravel (>2 mm)	%	—	—	<0.1	—	—
Nutrients						
Available Ammonium-N	mg/kg	—	—	21	—	—
Nitrogen, Organic	%	—	—	0.21	—	—
Nitrogen, Total Kjeldahl	%	—	—	0.22	—	—
Phosphate, Available-P	mg/kg	—	—	9.7	—	—
Phosphorus	mg/kg	—	—	1,010	—	—
Carbon, Total	%	—	—	2.1	—	—
Carbon, Inorganic	%	—	—	<0.1	—	—
Carbon, Total Organic	%	—	—	2.1	—	—
CaCO ₃ equivalent	%	—	—	<0.8	—	—
Total Metals						
Aluminum	mg/kg	—	—	14,800	—	—
Antimony	mg/kg	—	—	<0.1	—	—
Arsenic	mg/kg	5.9	17	6.7 ^(a)	100	0
Barium	mg/kg	—	—	93	—	—
Beryllium	mg/kg	—	—	0.48	—	—
Bismuth	mg/kg	—	—	0.32	—	—
Cadmium	mg/kg	0.6	3.5	<0.1	0	0
Chromium	mg/kg	37.3	90	53 ^(a)	100	0
Cobalt	mg/kg	—	—	11	—	—
Copper	mg/kg	35.7	197	20	0	0
Iron	mg/kg	—	—	25,000	—	—
Lead	mg/kg	35	91.3	4.3	0	0
Lithium	mg/kg	—	—	39	—	—
Manganese	mg/kg	—	—	236	—	—
Mercury	mg/kg	0.17	0.486	0.02	0	0
Molybdenum	mg/kg	—	—	0.69	—	—
Nickel	mg/kg	—	—	29	—	—

Table F-3 Sediment Quality Data From Lake Af1 During the Open-Water Period, 2013

Location Sampling Season Sample Date Easting (NAD 83, 12W) Northing (NAD 83, 12W)		Guidelines for the Protection of Aquatic Life		Lake Af1		
				Af-10	% Above Guideline	
				Fall		
				12-Sep-13		
		538299	ISQG	PEL		
7176361						
Total Metals (Continued)						
Selenium	mg/kg	—	—	<0.2	—	—
Silver	mg/kg	—	—	<0.2	—	—
Strontium	mg/kg	—	—	12	—	—
Sulfur	mg/kg	—	—	1,100	—	—
Thallium	mg/kg	—	—	0.21	—	—
Tin	mg/kg	—	—	<2	—	—
Titanium	mg/kg	—	—	970	—	—
Uranium	mg/kg	—	—	3.0	—	—
Vanadium	mg/kg	—	—	47	—	—
Zinc	mg/kg	123	315	61	0	0

a) Concentration higher than the ISQG.

— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-4 Sediment Quality Data From Sub-Basin Lakes During the Open-Water Period, 2013

	Unit	Guidelines for the Protection of Aquatic Life		Lake C1		
Location				C-L1	% Above Guideline	
Sampling Season				Fall		
Sample Date				14-Sep-13		
Easting (NAD 83, 12W)		ISQG	PEL	537612	ISQG	PEL
Northing (NAD 83, 12W)		7167085				
Physical Parameters						
Organic Matter	%	—	—	9.1	—	—
pH	pH units	—	—	5.4	—	—
Clay Content (<4 µm)	%	—	—	22	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	76	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	1.5	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	0.49	—	—
Gravel (>2 mm)	%	—	—	<0.1	—	—
Nutrients						
Available Ammonium-N	mg/kg	—	—	23	—	—
Nitrogen, Organic	%	—	—	0.32	—	—
Nitrogen, Total Kjeldahl	%	—	—	0.32	—	—
Phosphate, Available-P	mg/kg	—	—	27	—	—
Phosphorus	mg/kg	—	—	947	—	—
Carbon, Total	%	—	—	5.8	—	—
Carbon, Inorganic	%	—	—	<0.1	—	—
Carbon, Total Organic	%	—	—	5.8	—	—
CaCO ₃ equivalent	%	—	—	<0.8	—	—
Total Metals						
Aluminum	mg/kg	—	—	17,100	—	—
Antimony	mg/kg	—	—	<0.1	—	—
Arsenic	mg/kg	5.9	17	15 ^(a)	100	0
Barium	mg/kg	—	—	127	—	—
Beryllium	mg/kg	—	—	0.55	—	—
Bismuth	mg/kg	—	—	0.38	—	—
Cadmium	mg/kg	0.6	3.5	0.2	0	0
Chromium	mg/kg	37.3	90	60 ^(a)	100	0
Cobalt	mg/kg	—	—	15	—	—
Copper	mg/kg	35.7	197	54 ^(a)	100	0
Iron	mg/kg	—	—	25,000	—	—
Lead	mg/kg	35	91.3	5.5	0	0
Lithium	mg/kg	—	—	37	—	—
Manganese	mg/kg	—	—	280	—	—
Mercury	mg/kg	0.17	0.486	0.028	0	0
Molybdenum	mg/kg	—	—	2.2	—	—

Table F-4 Sediment Quality Data From Sub-Basin Lakes During the Open-Water Period, 2013

	Unit	Guidelines for the Protection of Aquatic Life		Lake C1		
Location				C-L1	% Above Guideline	
Sampling Season				Fall		
Sample Date				14-Sep-13		
Easting (NAD 83, 12W)		ISQG	PEL	537612	ISQG	PEL
Northing (NAD 83, 12W)				7167085		
Total Metals (Continued)						
Nickel	mg/kg	—	—	44	—	—
Selenium	mg/kg	—	—	0.43	—	—
Silver	mg/kg	—	—	<0.2	—	—
Strontium	mg/kg	—	—	13	—	—
Sulfur	mg/kg	—	—	2,600	—	—
Thallium	mg/kg	—	—	0.29	—	—
Tin	mg/kg	—	—	<2	—	—
Titanium	mg/kg	—	—	757	—	—
Uranium	mg/kg	—	—	3.2	—	—
Vanadium	mg/kg	—	—	51	—	—
Zinc	mg/kg	123	315	78	0	0

a) Concentration higher than the ISQG.

— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-5 Sediment Quality Data From Lake E1 During the Open-Water Period, 2013

Location	Sampling Season	Sample Date	Easting (NAD 83, 12W)	Northing (NAD 83, 12W)	Unit	Guidelines for the Protection of Aquatic Life		Lake E1		Summary Statistics								
								E-L1-1	E-L1-2	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
								Summer	Summer								ISQG	PEL
								23-Aug-13	23-Aug-13									
								535065	535292									
7174657	7174406	ISQG	PEL															
Physical Parameters																		
Depth	m	—	—	11.6	3.5	2	3.5	7.6	7.6	11.6	5.7	4.1	—	—				
Organic Matter	%	—	—	6.3	6.4	2	6.3	6.4	6.4	6.4	0.071	0.05	—	—				
pH	pH units	—	—	6.2	5.8	2	5.8	6.0	6.0	6.2	0.31	0.22	—	—				
Clay Content (<4 µm)	%	—	—	17	17	2	17	17	17	17	0.42	0.3	—	—				
Silt Content (4 µm to 0.063 mm)	%	—	—	78	80	2	78	79	79	80	1.7	1.2	—	—				
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	2.8	2.2	2	2.2	2.5	2.5	2.8	0.42	0.3	—	—				
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	1.2	0.79	2	0.79	0.98	0.98	1.17	0.27	0.19	—	—				
Gravel (>2 mm)	%	—	—	0.85	<0.1	2	<0.1	0.45	0.45	0.85	0.57	0.4	—	—				
Nutrients																		
Available Ammonium-N	mg/kg	—	—	31	20	2	20	25	25	31	7.6	5.4	—	—				
Nitrogen, Organic	%	—	—	0.34	0.36	2	0.34	0.35	0.35	0.36	0.019	0.014	—	—				
Nitrogen, Total Kjeldahl	%	—	—	0.34	0.36	2	0.34	0.35	0.35	0.36	0.018	0.013	—	—				
Phosphate, Available-P	mg/kg	—	—	20	80	2	20	50	50	80	43	30	—	—				
Phosphorus	mg/kg	—	—	1,010	715	2	715	863	863	1,010	209	148	—	—				
Carbon, Total	%	—	—	3.5	3.8	2	3.5	3.7	3.7	3.8	0.21	0.15	—	—				
Carbon, Inorganic	%	—	—	0.16	0.14	2	0.14	0.15	0.15	0.16	0.01	0.010	—	—				
Carbon, Total Organic	%	—	—	3.4	3.7	2	3.4	3.5	3.5	3.7	0.2	0.14	—	—				
CaCO ₃ equivalent	%	—	—	1.3	1.2	2	1.2	1.3	1.3	1	0.1	0.065	—	—				
Total Metals																		
Aluminum	mg/kg	—	—	18,200	17,600	2	17,600	17,900	17,900	18,200	424	300	—	—				
Antimony	mg/kg	—	—	<0.1	<0.1	2	<0.1	<0.1	<0.1	<0.1	—	—	—	—				
Arsenic	mg/kg	5.9	17	9.3 ^(a)	6.9 ^(a)	2	6.9 ^(a)	8.1 ^(a)	8.1 ^(a)	9.3 ^(a)	1.7	1.2	100	0				
Barium	mg/kg	—	—	122	131	2	122	127	127	131	6.4	4.5	—	—				
Beryllium	mg/kg	—	—	0.63	0.63	2	0.63	0.63	0.63	0.63	0	0	—	—				
Bismuth	mg/kg	—	—	<1	<1	2	<1	<1	<1	<1	—	—	—	—				
Cadmium	mg/kg	0.6	3.5	0.14	0.21	2	0.14	0.18	0.18	0.21	0.05	0.04	0	0				
Chromium	mg/kg	37.3	90	66 ^(a)	64 ^(a)	2	64 ^(a)	65 ^(a)	65 ^(a)	66 ^(a)	1.3	0.95	100	0				
Cobalt	mg/kg	—	—	12	12	2	12	12	12	12	0	0	—	—				
Copper	mg/kg	35.7	197	28	26	2	26	27	27	28	1.6	1.2	0	0				
Iron	mg/kg	—	—	28,800	23,200	2	23,200	26,000	26,000	28,800	3,960	2,800	—	—				
Lead	mg/kg	35	91.3	5.3	5.0	2	5.0	5.2	5.2	5.3	0.21	0.15	0	0				
Lithium	mg/kg	—	—	43	41	2	41	42	42	43	1.1	0.8	—	—				
Manganese	mg/kg	—	—	237	241	2	237	239	239	241	2.8	2.0	—	—				
Mercury	mg/kg	0.17	0.486	0.037	0.031	2	0.031	0.034	0.034	0.037	0.0044	0.0031	0	0				

Table F-5 Sediment Quality Data From Lake E1 During the Open-Water Period, 2013

Location	Unit	Guidelines for the Protection of Aquatic Life		Lake E1		Summary Statistics								
				E-L1-1	E-L1-2	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
				Summer	Summer								ISQG	PEL
				23-Aug-13	23-Aug-13									
		ISQG	PEL	535065	535292									
Sample Date				7174657	7174406									
Easting (NAD 83, 12W)														
Northing (NAD 83, 12W)														
Total Metals (Continued)														
Molybdenum	mg/kg	—	—	<1	<1	2	<1	<1	<1	<1	—	—	—	—
Nickel	mg/kg	—	—	35	35	2	35	35	35	35	0.14	0.10	—	—
Selenium	mg/kg	—	—	0.25	0.21	2	0.21	0.23	0.23	0.25	0.03	0.02	—	—
Silver	mg/kg	—	—	<0.2	<0.2	2	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Strontium	mg/kg	—	—	12	14	2	12	13	13	14	1.1	0.8	—	—
Sulfur	mg/kg	—	—	1,000	900	2	900	950	950	1,000	71	50	—	—
Thallium	mg/kg	—	—	0.28	0.3	2	0.28	0.29	0.29	0.3	0.014	0.010	—	—
Tin	mg/kg	—	—	<2	<2	2	<2	<2	<2	<2	—	—	—	—
Titanium	mg/kg	—	—	1,070	1,090	2	1,070	1,080	1,080	1,090	14	10	—	—
Uranium	mg/kg	—	—	3.9	3.8	2	3.8	3.8	3.8	3.9	0.071	0.05	—	—
Vanadium	mg/kg	—	—	57	55	2	55	56	56	57	1.5	1.1	—	—
Zinc	mg/kg	123	315	76	80	2	76	78	78	80	2.5	1.8	0	0

a) Concentration higher than the ISQG.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-6 Sediment Quality Data From Paul Lake During the Open-Water Period, 2013

Location		Guidelines for the Protection of Aquatic Life		Paul Lake Sampling Stations					Summary Statistics								
				PL-1	PL-2	PL-3	PL-4	PL-5	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
				Fall	Fall	Fall	Fall	Fall								ISQG	PEL
				14-Sep-13	14-Sep-13	14-Sep-13	15-Sep-13	15-Sep-13									
				533179	531655	528681	527145	525859									
Easting (NAD 83, 12W)	Unit	ISQG	PEL	7173835	7174122	7172550	7171895	7171047									
Northing (NAD 83, 12W)																	
Physical Parameters																	
Depth	m	—	—	9.1	8.0	13.0	8.0	8.0	5	8.0	9.3	8.0	13.0	2.5	1.1	—	—
Organic Matter	%	—	—	3.4	3.6	4.0	3.8	4.2	5	3.4	3.8	3.8	4.2	0.32	0.14	—	—
pH	pH units	—	—	5.6	5.3	5.2	5.6	5.5	5	5.2	5.4	5.5	5.6	0.16	0.072	—	—
Clay Content (<4 µm)	%	—	—	30	22	27	28	22	5	22	26	27	30	3.5	1.6	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	70	78	73	72	78	5	70	74	73	78	3.5	1.5	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	<0.1	<0.1	<0.1	0.23	0.3	5	<0.1	0.14	<0.1	0.3	0.12	0.054	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	<0.1	<0.1	<0.1	0.12	<0.1	5	<0.1	0.064	<0.1	0.12	0.031	0.014	—	—
Gravel (>2 mm)	%	—	—	<0.1	<0.1	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Nutrients																	
Available Ammonium-N	mg/kg	—	—	14	22	18	13	17	5	13	17	17	22	3.3	1.5	—	—
Nitrogen, Organic	%	—	—	0.18	0.16	0.22	0.26	0.28	5	0.16	0.22	0.22	0.28	0.051	0.023	—	—
Nitrogen, Total Kjeldahl	%	—	—	0.18	0.17	0.23	0.26	0.28	5	0.17	0.22	0.23	0.28	0.05	0.023	—	—
Phosphate, Available-P	mg/kg	—	—	13	8.8	11	71	14	5	8.8	23	13	71	26	12	—	—
Phosphorus	mg/kg	—	—	1,340	1,150	1,250	923	759	5	759	1,084	1,150	1,340	239	107	—	—
Carbon, Total	%	—	—	2.0	2.2	2.4	2.5	2.6	5	2.0	2.3	2.4	2.6	0.24	0.11	—	—
Carbon, Inorganic	%	—	—	<0.1	<0.1	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Carbon, Total Organic	%	—	—	2.0	2.2	2.4	2.5	2.6	5	2.0	2.3	2.4	2.6	0.24	0.11	—	—
CaCO ₃ equivalent	%	—	—	<0.8	<0.8	<0.8	<0.8	<0.8	5	<0.8	<0.8	<0.8	<0.8	0	0	—	—
Total Metals																	
Aluminum	mg/kg	—	—	21,700	18,700	19,100	21,400	20,700	5	18,700	20,320	20,700	21,700	1,354	605	—	—
Antimony	mg/kg	—	—	<0.1	<0.1	<0.1	<0.1	<0.1	5	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Arsenic	mg/kg	5.9	17	33 ^(b)	15 ^(a)	21 ^(b)	8.9 ^(a)	8.4 ^(a)	5	8.4 ^(a)	17 ^(a)	15 ^(a)	33 ^(b)	10	4.6	100	40
Barium	mg/kg	—	—	149	122	135	144	143	5	122	139	143	149	11	4.7	—	—
Beryllium	mg/kg	—	—	0.68	0.6	0.64	0.69	0.71	5	0.6	0.66	0.68	0.71	0.044	0.02	—	—
Bismuth	mg/kg	—	—	0.48	0.37	0.51	0.53	0.41	5	0.37	0.46	0.48	0.53	0.068	0.03	—	—
Cadmium	mg/kg	0.6	3.5	0.13	0.11	0.13	0.13	0.13	5	0.11	0.13	0.13	0.13	0.0089	0.004	0	0
Chromium	mg/kg	37.3	90	78 ^(a)	68 ^(a)	69 ^(a)	75 ^(a)	74 ^(a)	5	68 ^(a)	73 ^(a)	74 ^(a)	78 ^(a)	4.0	1.8	100	0
Cobalt	mg/kg	—	—	23	16	15	14	15	5	14	16	15	23	3.6	1.6	—	—
Copper	mg/kg	35.7	197	37 ^(a)	29	41 ^(a)	36 ^(a)	33	5	29	35	36 ^(a)	41 ^(a)	4.4	2.0	60	0
Iron	mg/kg	—	—	41,000	34,300	34,000	29,000	29,200	5	29,000	33,500	34,000	41,000	4,896	2,190	—	—
Lead	mg/kg	35	91.3	5.8	5.0	5.9	5.9	5.1	5	5.0	5.5	5.8	5.9	0.44	0.2	0	0
Lithium	mg/kg	—	—	52	49	49	54	56	5	49	52	52	56	3.2	1.4	—	—
Manganese	mg/kg	—	—	566	324	375	372	346	5	324	397	372	566	97	43	—	—
Mercury	mg/kg	0.17	0.486	0.023	0.022	0.03	0.03	0.026	5	0.022	0.027	0.026	0.032	0.0046	0.0021	0	0

Table F-6 Sediment Quality Data From Paul Lake During the Open-Water Period, 2013

Location		Guidelines for the Protection of Aquatic Life		Paul Lake Sampling Stations					Summary Statistics								
				PL-1	PL-2	PL-3	PL-4	PL-5	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
				Fall	Fall	Fall	Fall	Fall								ISQG	PEL
				14-Sep-13	14-Sep-13	14-Sep-13	15-Sep-13	15-Sep-13									
Sampling Season	Unit	ISQG	PEL	533179	531655	528681	527145	525859	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	ISQG	PEL
Sample Date				7173835	7174122	7172550	7171895	7171047									
Easting (NAD 83, 12W)																	
Northing (NAD 83, 12W)																	
Total Metals (Continued)																	
Molybdenum	mg/kg	—	—	1.7	0.77	2.0	1.3	1.2	5	0.8	1.4	1.3	2.0	0.47	0.21	—	—
Nickel	mg/kg	—	—	51	41	43	45	45	5	41	45	45	51	3.5	1.6	—	—
Selenium	mg/kg	—	—	0.21	<0.2	0.25	0.22	<0.2	5	<0.2	0.18	0.21	0.25	0.071	0.032	—	—
Silver	mg/kg	—	—	<0.2	<0.2	<0.2	<0.2	<0.2	5	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Strontium	mg/kg	—	—	15	15	14	16	16	5	14	15	15	16	0.73	0.33	—	—
Sulfur	mg/kg	—	—	6,100	1,600	1,800	1,100	1,100	5	1,100	2,340	1,600	6,100	2,124	950	—	—
Thallium	mg/kg	—	—	0.3	0.26	0.28	0.31	0.29	5	0.26	0.29	0.29	0.31	0.02	0.0088	—	—
Tin	mg/kg	—	—	<2	<2	<2	<2	<2	5	<2	<2	<2	<2	—	—	—	—
Titanium	mg/kg	—	—	1,210	1,170	1,110	1,300	1,250	5	1,110	1,208	1,210	1,300	73	33	—	—
Uranium	mg/kg	—	—	3.5	3.0	3.9	3.7	3.5	5	3.0	3.5	3.5	3.9	0.31	0.14	—	—
Vanadium	mg/kg	—	—	65	57	60	60	59	5	57	60	60	65	3.2	1.4	—	—
Zinc	mg/kg	123	315	90	77	81	88	86	5	77	84	86	90	5.1	2.3	0	0

a) Concentration higher than the ISQG.
b) Concentration higher than the PEL.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-7 Sediment Quality Data From Lac du Sauvage Outlet (Ab-S1) During the Open-Water Period, 2013

	Unit	Guidelines for the Protection of Aquatic Life		Station Ab-S1		
Location				Ab-S1	% Above Guideline	
Sampling Season				Fall		
Sample Date				12-Sep-13		
Easting (NAD 83, 12W)				546850		
Northing (NAD 83, 12W)				7159585		
Physical Parameters						
Organic Matter	%	—	—	<1	—	—
pH	pH units	—	—	6.7	—	—
Clay Content (<4 µm)	%	—	—	0.88	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	8.3	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	17	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	41	—	—
Gravel (>2 mm)	%	—	—	33	—	—
Nutrients						
Available Ammonium-N	mg/kg	—	—	<1	—	—
Nitrogen, Organic	%	—	—	<0.02	—	—
Nitrogen, Total Kjeldahl	%	—	—	<0.02	—	—
Phosphate, Available-P	mg/kg	—	—	5.3	—	—
Phosphorus	mg/kg	—	—	471	—	—
Carbon, Total	%	—	—	0.2	—	—
Carbon, Inorganic	%	—	—	<0.1	—	—
Carbon, Total Organic	%	—	—	0.22	—	—
CaCO ₃ equivalent	%	—	—	<0.8	—	—
Total Metals						
Aluminum	mg/kg	—	—	13,700	—	—
Antimony	mg/kg	—	—	<0.1	—	—
Arsenic	mg/kg	5.9	17	5.7	0	0
Barium	mg/kg	—	—	144	—	—
Beryllium	mg/kg	—	—	0.37	—	—
Bismuth	mg/kg	—	—	<0.2	—	—
Cadmium	mg/kg	0.6	3.5	<0.1	0	0
Chromium	mg/kg	37.3	90	56 ^(a)	100	0
Cobalt	mg/kg	—	—	8.3	—	—
Copper	mg/kg	35.7	197	15	0	0
Iron	mg/kg	—	—	18,000	—	—
Lead	mg/kg	35	91.3	2.1	0	0
Lithium	mg/kg	—	—	32	—	—
Manganese	mg/kg	—	—	149	—	—
Mercury	mg/kg	0.17	0.486	<0.005	0	0
Molybdenum	mg/kg	—	—	0.81	—	—

Table F-7 Sediment Quality Data From Lac du Sauvage Outlet (Ab-S1) During the Open-Water Period, 2013

	Unit	Guidelines for the Protection of Aquatic Life		Station Ab-S1		
Location				Ab-S1	% Above Guideline	
Sampling Season				Fall		
Sample Date				12-Sep-13		
Easting (NAD 83, 12W)		546850				
Northing (NAD 83, 12W)		7159585	ISQG	PEL		
Total Metals (continued)						
Nickel	mg/kg	—	—	27	—	—
Selenium	mg/kg	—	—	<0.2	—	—
Silver	mg/kg	—	—	<0.2	—	—
Strontium	mg/kg	—	—	3.8	—	—
Sulfur	mg/kg	—	—	900	—	—
Thallium	mg/kg	—	—	<0.05	—	—
Tin	mg/kg	—	—	<2	—	—
Titanium	mg/kg	—	—	751	—	—
Uranium	mg/kg	—	—	0.96	—	—
Vanadium	mg/kg	—	—	43	—	—
Zinc	mg/kg	123	315	34	0	0

a) Concentration higher than the ISQG.

— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.

Table F-8 Sediment Quality Data From Sub-Basin Streams During the Open-Water Period, 2013

Location	Unit	Guidelines for the Protection of Aquatic Life		Sub-Basin Stream Sampling Stations									Summary Statistics								
Sampling Season				C-S1	D-S1	F-S1	G-S1	L-S1	E-S2-1	E-S2-3	E-S2-4	E-S2-5	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
Sample Date				Summer	Summer	Summer	Summer	Fall	Fall	Fall	Fall	Fall								ISQG	PEL
Easting (NAD 83, 12W)				21-Aug-13	21-Aug-13	20-Aug-13	18-Aug-13	16-Sep-13	13-Sep-13	14-Sep-13	13-Sep-13	13-Sep-13									
Northing (NAD 83, 12W)				ISQG	PEL	539935	536832	541073	545193	550131	535267	535848									
				7166859	7170474	7176452	7174326	7159101	7176533	7179317	7178598	7177490									
Physical Parameters																					
Organic Matter	%	—	—	2.5	9.5	<1	<1	9.5	4.1	9.5	4.0	3.5	8	<1	4.8	4.0	9.5	3.7	1.2	—	—
pH	pH units	—	—	5.4	5.8	6.0	6.8	5.4	5.3	5.6	5.5	5.5	8	5.3	5.7	5.5	6.8	0.46	0.15	—	—
Clay Content (<4 µm)	%	—	—	1.1	3.0	0.33	0.6	5.1	9.0	6.7	4.4	4.3	8	0.33	3.8	4.3	9	2.9	0.97	—	—
Silt Content (4 µm to 0.063 mm)	%	—	—	16	43	6.3	5.4	46	80	90	71	67	8	5.4	47	46	90	32	11	—	—
Fine Sand (0.063 mm to 0.2 mm)	%	—	—	20	28	14	5.5	27	6.4	2.6	22	24	8	2.6	17	20	28	9.8	3.3	—	—
Coarse Sand (0.2 mm to 2.0 mm)	%	—	—	63	26	79	44	23	5.1	0.32	2.81	5.2	8	0.32	28	23	79	29	9.6	—	—
Gravel (>2 mm)	%	—	—	<0.1	<0.1	0.51	45	<0.1	<0.1	<0.1	<0.1	<0.1	8	<0.1	5.0	<0.1	45	15	4.9	—	—
Nutrients																					
Available Ammonium-N	mg/kg	—	—	14	46	4.0	4.2	17	5.2	33	19	8.6	8	4.0	17	14	46	14	4.8	—	—
Nitrogen, Organic	%	—	—	0.13	0.25	0.029	0.026	0.33	0.15	0.36	0.16	0.12	8	0.026	0.17	0.15	0.36	0.12	0.039	—	—
Nitrogen, Total Kjeldahl	%	—	—	0.13	0.25	0.029	0.027	0.33	0.15	0.36	0.16	0.12	8	0.027	0.17	0.15	0.36	0.12	0.039	—	—
Phosphate, Available-P	mg/kg	—	—	4.2	5.8	2.2	4.7	5.6	5.0	2.8	8.4	14	8	2.2	6.1	5.6	14	3.6	1.2	—	—
Phosphorus	mg/kg	—	—	321	499	<50	395	499	455	695	580	595	8	<50	452	499	695	195	65	—	—
Carbon, Total	%	—	—	2.4	6.4	0.2	0.2	6.2	2.9	6.5	2.9	2.1	8	0.2	3.3	2.9	6.5	2.5	0.83	—	—
Carbon, Inorganic	%	—	—	0.16	0.11	<0.1	0.11	<0.1	0.16	0.16	<0.1	0.16	8	<0.1	0.076	0.05	0.16	0	0.014	—	—
Carbon, Total Organic	%	—	—	2.2	6.3	0.16	<0.1	6.2	2.9	6.5	2.9	2.1	8	<0.1	3.3	2.9	6.5	2.5	0.84	—	—
CaCO ₃ equivalent	%	—	—	1.4	0.92	<0.8	0.89	<0.8	0.92	0.92	1.3	0.92	8	0.4	0.62	<0.8	1.4	0.35	0.12	—	—
Total Metals																					
Aluminum	mg/kg	—	—	6,600	9,920	425	8,830	7,540	11,700	10,100	9,390	10,100	8	425	8,289	9,390	11,700	3,309	1,103	—	—
Antimony	mg/kg	—	—	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0	8	<0.1	<0.1	<0.1	<0.1	—	—	—	—
Arsenic	mg/kg	5.9	17	2.1	7.1 ^(a)	0.17	5.7	4.8	2.5	3.6	2.7	2.4	8	0.17	3.4	2.7	7.1 ^(a)	2.1	0.7	11	0
Barium	mg/kg	—	—	47	50	2.6	66	56	71	67	65	63	8	2.6	54	63	71	21	7.0	—	—
Beryllium	mg/kg	—	—	<0.5	<0.5	<0.5	<0.5	0.25	0.34	0.34	0.34	0.37	8	0.25	0.29	0.25	0.37	0.05	0.02	—	—
Bismuth	mg/kg	—	—	<1	<1	<1	<1	<0.2	<0.2	<0.2	<0.2	<0.2	8	<0.2	0.28	<0.2	0.5	0.21	0.07	—	—
Cadmium	mg/kg	0.6	3.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	8	<0.1	<0.1	<0.1	<0.1	—	—	0	0
Chromium	mg/kg	37.3	90	25	31	1.3	96 ^(b)	29	42 ^(a)	35	34	35	8	1.3	36	34	96 ^(b)	25	8.3	22	11
Cobalt	mg/kg	—	—	3.7	11	<1	6.7	6.2	6.7	6.3	5.7	5.9	8	0.5	5.8	6.2	11	2.7	0.91	—	—
Copper	mg/kg	35.7	197	5.0	12	<1	6.2	19	9.5	8.5	9.1	7.8	8	0.5	8.6	8.5	19	4.9	1.6	0	0
Iron	mg/kg	—	—	10,400	15,200	609	14,600	10,100	15,300	16,500	13,400	13,700	8	609	12,201	13,700	16,500	4,855	1,618	—	—
Lead	mg/kg	35	91.3	1.4	2.5	<1	2.2	2.4	3.1	2.8	2.8	3.1	8	<1	2.3	2.5	3.1	0.86	0.29	0	0
Lithium	mg/kg	—	—	19	21	<2	27	17	31	29	28	30	8	<2	23	27	31	9.5	3.2	—	—
Manganese	mg/kg	—	—	102	171	5.9	259	217	147	154	131	137	8	5.9	147	147	259	71	24	—	—
Mercury	mg/kg	0.17	0.486	0.019	0.02	<0.005	0.0063	0.011	0.0065	0.0095	0.0072	0.0074	8	0.0025	0.0099	0.0074	0.02	0.0058	0.0019	0	0
Molybdenum	mg/kg	—	—	<1	<1	<1	3.5	0.46	0.27	0.31	0.46	0.24	8	0.24	0.73	0.46	3.5	1.05	0.35	—	—
Nickel	mg/kg	—	—	12	19	<1	47	19	19	17	16	16	8	<1	18	17	47	12	4.0	—	—

Table F-8 Sediment Quality Data From Sub-Basin Streams During the Open-Water Period, 2013

Location		Guidelines for the Protection of Aquatic Life		Sub-Basin Stream Sampling Stations									Summary Statistics								
				C-S1	D-S1	F-S1	G-S1	L-S1	E-S2-1	E-S2-3	E-S2-4	E-S2-5	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	% Above Guideline	
				Summer	Summer	Summer	Summer	Fall	Fall	Fall	Fall	Fall								ISQG	PEL
				21-Aug-13	21-Aug-13	20-Aug-13	18-Aug-13	16-Sep-13	13-Sep-13	14-Sep-13	13-Sep-13	13-Sep-13									
Sampling Season	Unit	ISQG	PEL	539935	536832	541073	545193	550131	535267	535848	535772	536113	Count	Min	Mean	Median	Max	Standard Deviation	Standard Error	ISQG	PEL
Sample Date				7166859	7170474	7176452	7174326	7159101	7176533	7179317	7178598	7177490									
Easting (NAD 83, 12W)																					
Northing (NAD 83, 12W)																					
Total Metals (Continued)																					
Selenium	mg/kg	—	—	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	8	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Silver	mg/kg	—	—	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	8	<0.2	<0.2	<0.2	<0.2	—	—	—	—
Strontium	mg/kg	—	—	5.3	6.0	<1	3.5	9.0	7.8	12	8.4	8.1	8	<1	6.7	7.8	12	3.3	1.1	—	—
Sulfur	mg/kg	—	—	<500	900	<500	<500	1,600	900	2,100	900	900	8	<500	894	900	2,100	632	211	—	—
Thallium	mg/kg	—	—	<0.1	0.1	<0.1	0.19	0.094	0.19	0.18	0.16	0.17	8	<0.1	0.13	0.16	0.19	0.057	0.019	—	—
Tin	mg/kg	—	—	<2	<2	<2	<2	<2	<2	<2	<2	<2	8	<2	<2	<2	<2	—	—	—	—
Titanium	mg/kg	—	—	448	485	27	588	467	825	679	740	754	8	27	557	588	825	241	80	—	—
Uranium	mg/kg	—	—	0.81	1.5	<0.1	2.0	1.4	2.2	2.5	2.4	2.6	8	<0.1	1.7	2.0	2.6	0.85	0.28	—	—
Vanadium	mg/kg	—	—	19	26	1.1	26	24	33	30	29	28	8	1.1	24	26	33	9.5	3.2	—	—
Zinc	mg/kg	123	315	20	35	<5	35	30	41	41	37	41	8	<5	31	35	41	13	4.2	0	0

a) Concentration higher than the ISQG.
b) Concentration higher than the PEL.
— = no guideline or data; NAD = North American Datum; ISQG = Interim Sediment Quality Guideline; PEL = probable effects level; pH = potential of hydrogen, provides measure of the acidity or alkalinity of a solution on a scale of 0 to 14; % = percent; µm = micrometres; m = metre; mg/kg = milligrams per kilogram; mm = millimetre; < = less than; > = greater than.