

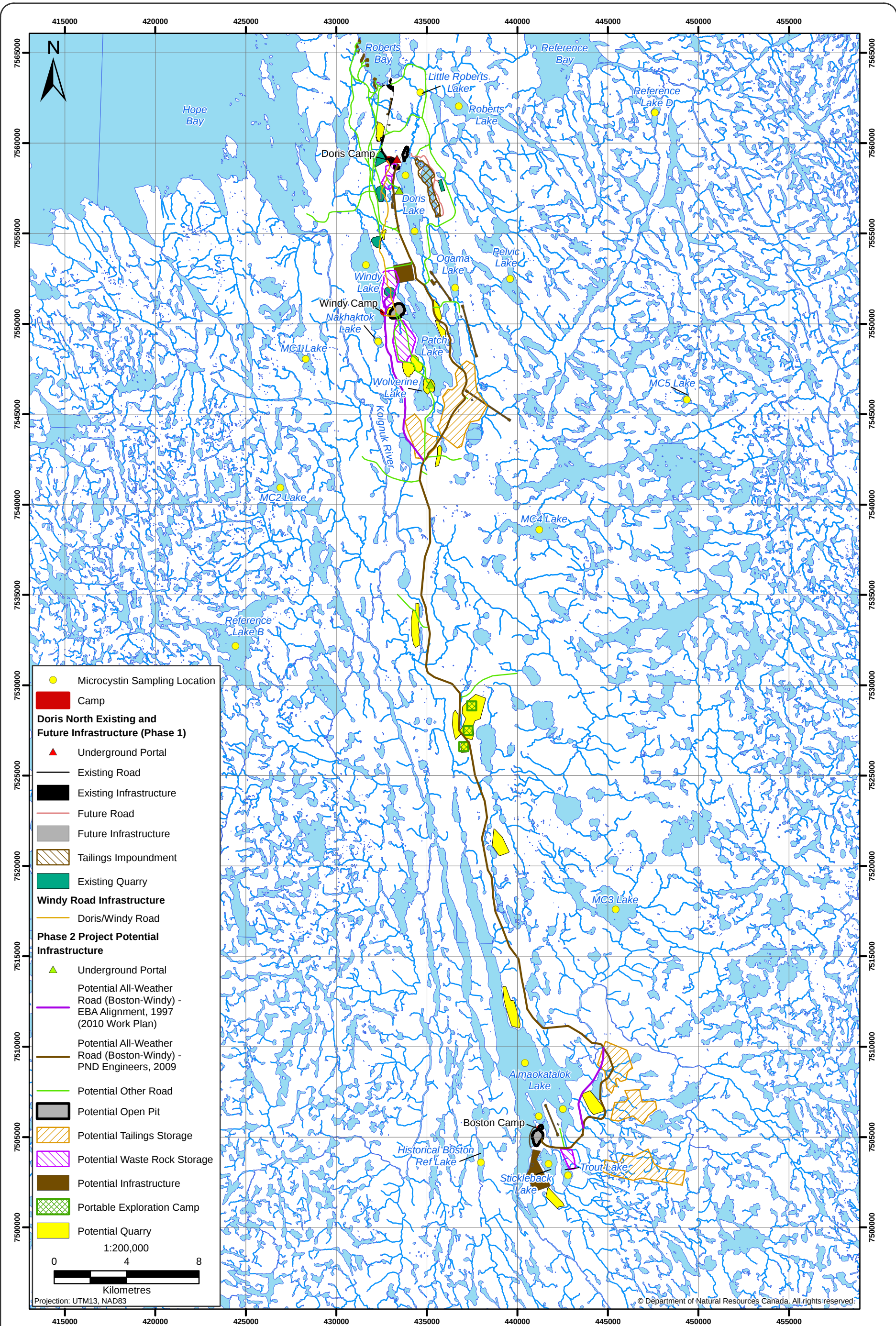


Figure 1

Figure 1



2010 Microcystin-LR Sampling Locations



For summer (August and September) microcystin LR sampling, a Teflon-lined GO-FLO bottle was used for water collection. Microcystin LR samples were collected at approximately 1 m below the surface at all sites, and an additional sample was collected at 2 m above the water-sediment interface at certain sites. The water collected was used to triple-rinse the sample containers before filling sample bottles.

All water samples were kept cold and sent to ALS in Yellowknife on the first available flight out of camp. Samples were then sent to ALS's Burnaby laboratory for analysis of microcystin LR. The analytical detection limit for microcystin LR analysis at ALS is 0.2 µg/L.

Results

Microcystin sampling results are provided in Appendix A. Out of the 45 samples collected from lakes within the Doris Watershed and various other lakes in the region, microcystin-LR concentrations were below the detection limit of 0.2 µg/L in all but a single sample collected from MC3 Lake on September 16, 2010. The concentration of microcystin-LR in this sample from MC3 Lake was 0.26 µg/L, which is barely above the analytical detection limit and well below the Health Canada maximum acceptable concentration in drinking water of 1.5 µg/L.

Although these results suggest that microcystin-LR concentrations are low in lakes in and around the Hope Bay Belt area, samples collected from near the drinking water intake pipe in Doris Lake in February 2009 by ESR staff contained microcystin-LR concentrations that slightly exceeded the Health Canada guideline of 1.5 µg/L. Microcystin levels in lakes can be highly variable seasonally and inter-annually because concentrations of this toxin are highly dependent on environmental conditions and on the abundance of certain species of cyanobacteria that produce microcystin (Health Canada 2002).

The genera of cyanobacteria known to produce microcystins are: *Anabaena*, *Microcystis*, *Oscillatoria*, *Nostoc*, and *Anabaenopsis* (Codd et al. 1999). Blooms of cyanobacteria have been observed in certain lakes of the Hope Bay Belt region. In August of 2009, the phytoplankton composition of three lakes—Doris, Ogama, and Little Roberts lakes—were dominated by cyanobacteria (*Aphanizomenon* in Doris Lake, and both *Aphanizomenon* and *Oscillatoria* in Ogama and Little Roberts lakes; Rescan 2010). In August of 2010, cyanobacteria made up approximately one third (by abundance) of the phytoplankton assemblages in Trout and Windy lakes (*Anabaena* in Trout Lake and *Aphanizomenon* in Windy Lake; Rescan 2011); however, microcystin-LR concentrations remained below the detection limit in surface samples collected from these lakes concurrently with phytoplankton samples.

Conclusions

The purpose of this 2010 microcystin survey was to determine if microcystin-LR concentrations were naturally elevated in lakes in and around the Hope Bay Belt area. The results of this survey indicate that microcystin-LR concentrations were low throughout the Hope Bay Belt region in 2010. Microcystin-LR concentrations measured between April and September 2010 were below the analytical detection limit of 0.2 µg/L in nearly all lakes surveyed, including Doris Lake. MC3 Lake was the only lake in which the microcystin-LR concentration was above the detection limit, and the concentration of microcystin-LR in this lake in September 2010 was 0.26 µg/L, which is barely above the analytical detection limit and well below the Health Canada maximum acceptable concentration in drinking water of 1.5 µg/L. Because microcystin concentrations can be highly variable seasonally and inter-annually, the results of this survey cannot rule out the potential for elevated microcystin-LR levels in lakes in the Hope Bay Belt region, because microcystin-producing genera of cyanobacteria are known to occur in the region, and can dominate the summer assemblages in certain lakes. However, results of

this survey indicate that elevated microcystin-LR concentrations are not a widespread or common occurrence in Hope Bay Belt area lakes.

References

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Appendix A. Microcystin Sampling Results

Site ID			Ref. B	Ref. B	Ref. D	Ref. D	Windy	Windy	Little Roberts	Little Roberts	Doris North	Doris North
Depth Zone	Health Canada		Surface	Deep	Surface	Surface	Deep	Surface	Surface	Surface	Surface	Deep
Depth (m)	Maximum		2.7	4.3	2.5	2.5	16	2.8	2.8	2.8	2.8	11.5
Date Sampled	Acceptable		18-APR-10	18-APR-10	18-APR-10	18-APR-10	19-APR-10	19-APR-10	22-APR-10	22-APR-10	22-APR-10	22-APR-10
ALS Sample ID	Units	Concentration for Drinking Water	L879365-1	L879365-2	L879365-3	L879365-4	L879372-3	L879372-4	L880317-1	L880317-2	L880317-3	L880317-4
Microcystin-LR	µg/L	1.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Site ID			Doris South	Doris South	Aim. Stn 6	Aim. Stn 6	Aim. Stn 5	Aim. Stn 5	Aim. Stn 11	Stickleback	Trout	Aim. Stn 11
Depth Zone	Health Canada		Surface	Surface	Surface	Deep	Surface	Surface	Surface	Surface	Surface	Surface
Depth (m)	Maximum		3	3	2.6	24	2.8	2.8	2.6	2.8	2.8	1
Date Sampled	Acceptable		22-APR-10	22-APR-10	25-APR-10	25-APR-10	25-APR-10	25-APR-10	25-APR-10	26-APR-10	26-APR-10	15-AUG-10
ALS Sample ID	Units	Concentration for Drinking Water	L880317-5	L880317-6	L880485-2	L880485-4	L880485-5	L880485-6	L880485-7	L881551-1	L881551-2	L921923-1
Microcystin-LR	µg/L	1.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Site ID			Aim. Stn 11	Trout	Stickleback	Windy	Stickleback	Aim. Stn 5	Aim. Stn 5	Equipment Blank	Ref. D
Depth Zone	Health Canada		Surface	Surface	Surface	Surface	Surface	Surface	Surface		Surface
Depth (m)	Maximum		1	1	1	1	1	1	1		1
Date Sampled	Acceptable		15-AUG-10	15-AUG-10	19-AUG-10	21-AUG-10	21-AUG-10	21-AUG-10	21-AUG-10	21-AUG-10	21-AUG-10
ALS Sample ID	Units	Concentration for Drinking Water	L921923-2	L921923-4	L923075-1	L923760-16	L926333-1	L926333-3	L926333-4	L926333-5	L926333-6
Microcystin-LR	µg/L	1.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Site ID			Ref. B	Ogama	Roberts	Pelvic	MC2	Nakhaktok	MC1	MC4	MC5	Little Roberts
Depth Zone	Health Canada		Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Depth (m)	Maximum		1	1	1	1	1	1	1	1	1	1
Date Sampled	Acceptable		24-AUG-10	10-SEP-10	11-SEP-10	11-SEP-10	11-SEP-10	11-SEP-10	11-SEP-10	11-SEP-10	11-SEP-10	12-SEP-10
ALS Sample ID	Units	Concentration for Drinking Water	L926334-1	L930662-1	L930662-2	L930662-3	L930662-4	L930662-5	L930662-6	L930662-7	L930662-8	L930857-1
Microcystin-LR	µg/L	1.5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Site ID			Doris North	Doris South	MC3	Boston Historical Ref.	Ref. B	Ref. B	Ref. D
Depth Zone	Health Canada		Surface	Surface	Surface	Surface	Surface	Deep	Surface
Depth (m)	Maximum		1	1	1	1	1	8.5	1
Date Sampled	Acceptable		12-SEP-10	12-SEP-10	16-SEP-10	16-SEP-10	17-SEP-10	17-SEP-10	25-SEP-10
ALS Sample ID	Units	Concentration for Drinking Water	L930857-2	L930857-5	L933176-1	L933176-2	L933534-1	L933534-2	L936328-1
Microcystin-LR	µg/L	1.5	<0.20	<0.20	0.26	<0.20	<0.20	<0.20	<0.20

Appendix 2.1-1

Bathymetric Benchmarks, Hope Bay Belt Project, 2010

Appendix 2.1-1. Bathymetric Benchmarks, Hope Bay Belt Project, 2010

Stickleback Lake (Benchmark UTM Coordinates: 13W 0441631 7502965)
Elevation difference between benchmark and water level =
 3.556 ± 0.003 m



Holding surveyors rod for elevation measurement



Close-up view of benchmark location



Close-up view of benchmark location

Trout Lake (Benchmark UTM Coordinates:
13W 0442337 7503660)
Elevation difference between benchmark and water level =
 3.36 ± 0.003 m



Landscape view of benchmark



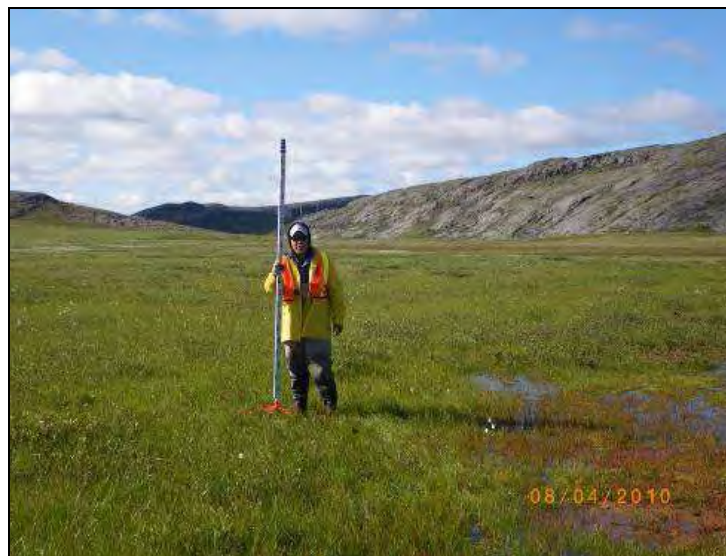
Boulder used for benchmark



Close-up view of benchmark at top of boulder

Little Roberts Lake (Benchmark UTM Coordinates: 13W 0434849 7562676

Elevation difference between benchmark and water level = 0.331 ± 0.003 m



Landscape view of benchmark



Benchmark installed along shoreline



Surveying the benchmark and the water level

Reference B Lake (Benchmark UTM Coordinates: 13W 0425325 7531641)

Elevation difference between benchmark and water level = 1.726 ± 0.003 m



Landscape view of benchmark



Benchmark on top of boulder



Close-up view of benchmark

Reference D Lake (Benchmark UTM Coordinates: 13W 0447430 7561072)

Elevation difference between benchmark and water level = 1.656 ± 0.003 m



Benchmark along shoreline



Benchmark on top of boulder



Surveying the benchmark

Imniagut Lake (Benchmark UTM Coordinates:

13W 0433704 7551038)

Elevation difference between benchmark and water level =
 2.860 ± 0.004 m



Benchmark along shoreline



Close-up of benchmark at top of boulder



Surveying the shoreline

Appendix 3.1-1

Lakes Dissolved Oxygen/Temperature Profiles, Hope Bay
Belt Project, 2010

Appendix 3.1-1. Lakes Dissolved Oxygen/Temperature Profiles, Hope Bay Belt Project, 2010

Lake	Stickleback					
Date	26-Apr-10			19-Aug-10		
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.8 m			11.2	9.42	100.6
0.5				11.2	9.42	100.7
1				11.2	9.43	100.7
1.5				11.2	9.40	100.3
2	1.1	1.32	11.9	11.2	9.41	100.0
	bottom depth = 2.5 m			bottom depth = 2.6 m		

Lake	Trout					
Date	26-Apr-10			16-Aug-10		
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.83 m			12.6	8.78	96.8
0.5				12.6	8.79	96.9
1				12.6	8.82	97.0
1.5				12.6	8.79	96.9
2	0.8	4.16	37.4	12.6	8.77	96.7
	bottom depth = 2.4 m			bottom depth = 2.4 m		

Lake	Aim. Stn 13			Aim. Stn 2			Aim. Stn 12		
Date	13-Aug-10			18-Aug-10			21-Aug-10		
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)	Temp (°C)	(mg/L)	(% Saturation)
0	13.8	10.19	98.4	11.7	8.51	91.5	13.8	10.42	117.2
0.5	13.8	10.18	98.3	11.7	8.51	91.7			
1	13.9	10.15	98.3	11.6	8.49	91.5			
1.5	13.8	10.14	98.2	11.6	8.49	91.5			
2	13.9	10.14	98.1	11.6	8.44	91.3			
2.5	13.9	10.13	98.0						
3	13.9	10.14	98.0						
3.5	13.9	10.11	97.9						
	bottom depth = 3.7 m			bottom depth = 2.5 m			bottom depth = 0.3 m		

Lake	Aim. Stn 5					
Date	25-Apr-10			12-Aug-10		
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.76 m			14.6	10.03	98.7
0.5				14.7	10.02	98.7
1				14.7	9.99	98.6
1.5				14.8	9.96	98.4
1.8	0.0	13.25	116.6			
	0.0	13.21	116.6			
2				14.8	9.95	98.3
	bottom depth = 2.0 m			bottom depth = 2.5 m		

Appendix 3.1-1. Lakes Dissolved Oxygen/Temperature Profiles, Hope Bay Belt Project, 2010

Lake		Aim. Stn 11				
Date		25-Apr-10			16-Aug-10	
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.60 m			12.1	9.21	100.2
0.5				12.1	9.21	100.2
1				12.1	9.22	100.2
1.6	0.1	13.15	116.0	12.1	9.22	100.5
2				12.1	9.23	100.3
2.5				12.1	9.21	100.2
	bottom depth = 1.8 m			bottom depth = 2.6 m		

Lake Aim. Stn 6						
Date		25-Apr-10			14-Aug-10	
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.57 m			13.9	10.09	97.7
1				13.8	10.09	97.4
2	0.7	10.84	97.4	13.7	10.07	97.1
3	1.2	10.24	92.2	13.7	10.04	96.8
4	1.3	9.81	89.3	13.7	10.02	96.6
5	1.4	9.45	86.2	13.7	10.10	96.4
6	1.4	8.91	81.6	13.7	9.99	96.3
7	1.5	8.58	78.4	13.7	9.97	96.1
8	1.5	8.60	78.6	13.7	9.95	95.9
9	1.5	8.60	78.6	13.7	9.93	95.7
10	1.5	8.56	78.3	13.6	9.93	95.4
11	1.5	8.24	75.4	13.6	9.89	95.1
12	1.6	7.80	71.5	13.6	9.87	94.9
13	1.7	7.43	68.3	13.6	9.84	94.6
14	1.8	7.16	65.9	13.6	9.82	94.4
15	1.8	6.90	63.6	13.6	9.79	94.2
16	1.8	6.77	62.4	13.5	9.78	93.9
17	1.9	6.60	60.9	13.3	9.66	92.3
18	1.9	6.44	59.5	13.2	9.50	90.6
19	1.9	6.31	58.3	12.6	9.27	87.2
20	1.9	6.09	56.3	12.3	9.22	86.1
21	1.9	5.98	55.2	12.3	9.12	85.2
22	2.0	5.67	52.5	12.2	9.50	84.3
23	2.1	5.14	47.7	12.2	8.96	83.5
24	2.2	4.41	41.1	12.2	8.83	82.3
25	2.2	3.43	31.9	12.1	8.79	81.7
26	2.3	2.92	27.2	12.1	8.76	81.5
bottom depth = 27.0 m				bottom depth = 28.0 m		

Appendix 3.1-1. Lakes Dissolved Oxygen/Temperature Profiles, Hope Bay Belt Project, 2010

Lake	Windy Deep					
Date	19-Apr-10			21-Aug-10		
Depth	Temp	Dissolved Oxygen	Dissolved Oxygen	Temp	Dissolved Oxygen	Dissolved Oxygen
(m)	(°C)	(mg/L)	(% Saturation)	(°C)	(mg/L)	(% Saturation)
0	ice thickness = 1.77m			11.8	10.27	95.5
0.5				11.8	10.30	96.2
1				11.8	10.25	94.9
1.5				11.8	10.25	94.4
2	0.7	11.79	105.6	11.8	10.20	94.1
2.5	0.7	11.79	105.6	11.8	10.19	94.0
3	0.7	11.76	105.4	11.8	10.23	94.7
3.5	0.7	11.75	105.2	11.8	10.20	94.3
4	0.7	11.73	105.1	11.7	10.22	94.4
4.5	0.7	11.71	104.9	11.7	10.23	94.6
5	0.7	11.69	104.8	11.7	10.23	94.6
5.5	0.7	11.67	104.5	11.7	10.24	94.5
6	0.7	11.64	104.3	11.7	10.26	94.6
6.5	0.7	11.62	104.2	11.7	10.25	94.2
7	0.7	11.59	103.9	11.7	10.26	94.3
7.5	0.7	11.56	103.6	11.7	10.23	93.8
8	0.7	11.52	103.2	11.6	10.24	94.4
8.5	0.7	11.47	102.8	11.6	10.29	94.5
9	0.7	11.38	102.1	11.6	10.28	94.7
9.5	0.7	11.31	101.4	11.6	10.28	94.4
10	0.8	11.21	100.7	11.6	10.27	94.4
10.5	0.8	11.06	99.4	11.6	10.27	94.4
11	0.9	10.92	98.4	11.6	10.27	94.0
11.5	1.0	10.72	96.8	11.6	10.26	94.2
12	1.1	10.33	93.6	11.6	10.27	94.6
12.5	1.2	10.13	92.0	11.6	10.24	94.0
13	1.3	9.90	90.1	11.6	10.19	94.0
13.5	1.4	9.62	87.7	11.5	10.25	94.1
14	1.5	9.41	86.0	11.5	10.20	94.1
14.5	1.6	9.03	82.7	11.5	10.24	93.7
15	1.6	8.45	77.8	11.4	10.21	93.5
15.5	1.7	8.36	76.8	11.4	10.18	93.2
16	1.8	8.28	76.3	11.4	10.16	93.0
16.5	1.9	7.20	66.3	11.4	10.17	92.9
17	2.1	6.16	57.6	11.4	10.16	93.1
17.5	2.2	3.77	35.1			
	bottom depth = 17.7 m			bottom depth = 18.0 m		

Appendix 3.1-2

Stream and River Dissolved Oxygen/Temperature
Profiles, Hope Bay Belt Project, 2010

Appendix 3.1-2. Stream and River Dissolved Oxygen/Temperature Profiles, Hope Bay Belt Project, 2010

River	Aim. R.						Koig. R.			Koig. U/S						
Date	26-Apr-10			21-Aug-10			25-Apr-10			18-Apr-10						
Depth (m)	Temp (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Temp (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Temp (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)	Temp (°C)	Dissolved Oxygen (mg/L)	Dissolved Oxygen (% Saturation)				
0	ice thickness = 0.6 m (reached bottom)			10.7	10.19	107.1	ice thickness = 1.81 m			ice thickness = 1.46 m						
0.5																
1																
1.5																
2							0.5			10.72	95.6	0			9.46	83.2
2.5							0.8			9.74	87.4	0			9.51	83.8
3							1			9.29	83.9					
3.5							1			8.25	74.5					
4							1.1			8.03	72.6					
4.5																
	bottom depth = 0.6 m			bottom depth = 0.4 m			bottom depth = 4.3 m			bottom depth = 2.0 m						

Appendix 3.2-1

Lake Water Quality Analytical Results, Hope Bay Belt
Project, 2010

Appendix 3.2-1. Lake Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:				Stickleback	Trout	Aim. Stn 5	Aim. Stn 5	Aim. Stn 11	Aim. Stn 6	Aim. Stn 6	Windy Deep	Windy Deep	Aim. Stn 13	Aim. Stn 6	Aim. Stn 6	Aim. Stn 11	Aim. Stn 11	Trout	Stickleback	Windy Deep	Windy Deep	Windy Deep	Stickleback	Aim. Stn 5	Aim. Stn 5	
Depth Zone:				Surface	Surface	Surface	Surface	Surface	Deep	Deep	Surface	Surface	Surface	Surface	Deep	Surface	Surface	Surface	Surface	Surface	Surface	Deep	Surface	Surface	Surface	
Depth (m):				1	1	1	1	1	24	16	1	1	1	1	26	1	1	1	1	1	1	16	1	1	1	
Replicate:				1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	2	1	1	1	1	
Date Sampled:				26-Apr-10	26-Apr-10	25-Apr-10	25-Apr-10	25-Apr-10	25-Apr-10	19-Apr-10	19-Apr-10	13-Aug-10	14-Aug-10	14-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	19-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	21-Aug-10	
ALS Sample ID:	Units		of Freshwater Aquatic Life ^a	RDL ^b	L881551-1	L881551-2	L880485-5	L880485-6	L880485-7	L880485-2	L880485-4	L879372-3	L879372-4	L921179-1	L921179-2	L921179-3	L921923-1	L921923-2	L921923-4	L923075-1	L923760-16	L923760-17	L923760-18	L926333-1	L926333-3	L926333-4
Total Metals (continued)																										
Tellurium (Te)	mg/L		0.000010	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Thallium (Tl)	mg/L	0.0008	0.0000020-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	<0.00010	<0.00010	<0.00010	<0.00010	
Tin (Sn)	mg/L		0.00010-0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Titanium (Ti)	mg/L		0.00020-0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
Uranium (U)	mg/L		0.0000020-0.000010	0.000033	0.000117	0.000043	0.000043	0.000037	0.000032	0.000030	0.000171	0.000203	0.000023	0.000023	0.000022	0.000028	0.000026	0.000044	0.000013	0.000176	0.000179	0.000175	0.000012	0.000025	0.000024	
Vanadium (V)	mg/L		0.000050-0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.00050	<0.00050	
Zinc (Zn)	mg/L	0.03	0.0010-0.0030	0.0208	0.0080	0.0027	0.0041	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	0.0015	0.0010	0.0014	0.0014	0.0018	0.0011	<0.0010	0.0021	<0.0010	<0.0010	<0.0010	<0.0010	
Dissolved Metals																										
Aluminum (Al)	mg/L		0.0010-0.0030	<0.0010	0.0468	0.0118	0.0121	0.0128	0.0086	0.0221	0.0022	0.0024	0.0106	0.0106	0.0105	0.0137	0.0129	0.0244	0.0015	0.0044	0.0045	0.0044	<0.0010	0.0122	0.0198	
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Arsenic (As)	mg/L		0.000030-0.00070	<0.00070	0.00046	0.000220	0.000225	0.000212	0.000164	0.000142	<0.00060	<0.00070	0.00010	0.00010	<0.00010	0.000158	0.000120	0.00020	0.00022	<0.00050	<0.00050	<0.00050	0.00029	0.000106	0.000106	
Barium (Ba)	mg/L		0.000050-0.00010	0.0219	0.0182	0.00311	0.00329	0.00267	0.00184	0.00219	0.00241	0.00222	0.00155	0.00157	0.00156	0.00156	0.00154	0.00406	0.00488	0.00206	0.00202	0.00200	0.00468	0.00164	0.00161	
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)	mg/L		0.0010-0.0050	0.0338	0.0117	0.0069	0.0068	0.0065	0.0051	0.0051	0.0540	0.0567	0.0093	0.0073	0.0085	0.0084	0.0083	0.0088	0.0198	0.0526	0.0492	0.0506	0.0205	0.0088	0.0096	
Cadmium (Cd)	mg/L		0.0000050-0.000020	0.000013	0.000014	0.000012	<0.000020	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Calcium (Ca)	mg/L		0.02-0.05	45.5	28.9	4.32	4.27	4.23	3.17	3.32	13.3	13.8	2.29	2.26	2.31	2.43	2.33	6.91	17.6	11.6	11.7	11.5	17.2	2.36	2.37	
Chromium (Cr)	mg/L		0.00010-0.00050	<0.00050	0.00080	0.00023	0.00028	0.00022	0.00021	0.00016	0.00056	0.00060	<0.00050	<0.00050	<0.00050	0.00021	<0.00020	<0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	
Cobalt (Co)	mg/L		0.000050-0.00010	<0.00010	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	
Copper (Cu)	mg/L		0.00010-0.00050	0.00065	0.00464	0.00155	0.00159	0.00149	0.00114	0.00112	0.00076	0.00074	0.00086	0.00079	0.00076	0.00097	0.00089	0.00149	0.00037	0.00080	0.00074	0.00035	0.00080	0.00083	0.00083	
Iron (Fe)	mg/L		0.010-0.030	<0.010	0.318	0.034	0.030	0.047	0.018	0.027	<0.010	<0.010	0.030	0.028	0.027	0.030	0.030	0.102	<0.010	<0.010	<0.010	<0.010	<0.010	0.035	0.030	
Lead (Pb)	mg/L		0.000050	<0.000050	0.000059	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000070	0.000075	<0.000050	0.000096	0.000113	0.000222	<0.000050	0.000055	<0.000050	<0.000050	0.000073	<0.000050	<0.000050	
Lithium (Li)	mg/L		0.00020-0.0050	0.0111	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Magnesium (Mg)	mg/L		0.0050-0.10	16.3	7.36	2.56	2.57	2.48	1.85	1.91	11.2	11.5	1.30	1.32	1.32	1.40	1.39	1.79	6.17	9.12	9.26	9.27	5.97	1.39	1.40	
Manganese (Mn)	mg/L		0.000050-0.00020	0.0469	0.00887	0.00179	0.00154	0.00151	0.000458	0.00767	0.000093	<0.000050	0.000578	0.000779	0.00102	0.000639	0.000608	0.000317	0.000060	0.000078	0.000058	0.000051	<0.000050	0.000602	0.000430	
Mercury (Hg)	mg/L		0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000017	0.000020	0.000020	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)	mg/L		0.000050	0.000052	0.000162	0.000059	0.000068	0.000064	<0.000050	<0.000050	0.000661	0.000731	<0.000050	<0.000050	<0.000050	<0.000050	0.000654	<0.000050	0.000654	0.000625	0.000641	0.0.				

Appendix 3.2-2

Water Quality QA/QC Results, Hope Bay Belt Project,
2010

Appendix 3.2-2. Water Quality QA/QC Results, Hope Bay Belt Project, 2010

Site Abbreviation:			Equipment Blank	Equipment Blank	Travel Blank	Field Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank
Date Sampled:			18-Apr-10	18-Apr-10	18-Apr-10	22-Apr-10	25-Apr-10	17-Jun-10	17-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	08-Aug-10	10-Aug-10
ALS Sample ID:			L879372-5	L879380-1	L879380-2	L880317-7	L880485-10	L899505-5	L899508-5	L900028-30	L900028-32	L900033-3	L919821-1	L919821-7
RDL ^a														
Physical Tests														
Conductivity	µS/cm	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hardness (as CaCO ₃)	mg/L	0.5-1.0	<0.50	<1.0	<1.0	<1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
pH	pH	0.1	5.92	5.83	5.69	5.90	5.68	5.98	5.59	5.81	5.60	5.62	5.65	5.64
Total Suspended Solids	mg/L	3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	mg/L	10	<10	<10	<10	-	<10	-	<10	<10	<10	-	-	-
Turbidity	NTU	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anions and Nutrients														
Acidity (as CaCO ₃)	mg/L	1.0	-	-	-	-	-	-	-	-	-	-	-	-
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	-	-	-
Alkalinity, Carbonate (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	-	-	-
Alkalinity, Hydroxide (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	-	-	-
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ammonia as N	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	<0.0050	0.0066	0.0060	<0.005	<0.0050	<0.0050
Bromide (Br)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.050	<0.050	<0.050	<0.050	-	<0.050	-	<0.050	<0.050	<0.050	-	-	-
Ortho Phosphate as P	mg/L	0.0010	<0.0010	<0.0010	<0.0010	-	<0.0010	-	<0.0010	<0.0010	<0.0010	-	-	-
Total Phosphorus	mg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Sulphate (SO ₄)	mg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cyanides														
Cyanide, Total	mg/L	0.0010	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	-	<0.0010	<0.0010	<0.0010
Organic / Inorganic Carbon														
Total Organic Carbon	mg/L	0.20-0.50	<0.20	0.34	0.28	<0.20	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-
Total Metals														
Aluminum (Al)	mg/L	0.0010-0.0030	<0.0010	<0.0030	<0.0030	<0.0030	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	<0.0030
Antimony (Sb)	mg/L	0.000010-0.00010	<0.00010	<0.000010	<0.000010	<0.000010	<0.00010	<0.000010	<0.00010	<0.00010	<0.00010	<0.000010	<0.000010	<0.000010
Arsenic (As)	mg/L	0.000030-0.00010	<0.000030	<0.000050	<0.000050	<0.000050	<0.000030	<0.000050	<0.000030	<0.000030	<0.000050	<0.000050	<0.000050	<0.000050
Barium (Ba)	mg/L	0.000050-0.00010	<0.000050	<0.00010	<0.00010	<0.00010	<0.000050	<0.00010	<0.000050	<0.000050	<0.000050	0.00012	<0.00010	<0.00010
Beryllium (Be)	mg/L	0.0000050-0.00020	<0.00020	<0.0000050	<0.0000050	<0.0000050	<0.00020	<0.0000050	<0.00020	<0.00020	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Bismuth (Bi)	mg/L	0.000050-0.00050	<0.00050	<0.000050	<0.000050	<0.000050	<0.00050	<0.000050	<0.00050	<0.00050	<0.00050	<0.000050	<0.000050	<0.000050
Boron (B)	mg/L	0.0010-0.0050	<0.0010	<0.0050	<0.0050	<0.0050	0.0012	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)	mg/L	0.0000050-0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.000010	<0.0000050	<0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Calcium (Ca)	mg/L	0.02-0.05	<0.020	<0.050	<0.050	<0.050	<0.020	<0.050	<0.020	<0.020	<0.020	<0.050	<0.050	<0.050
Cesium (Cs)	mg/L	0.0000050	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-	-	-	<0.0000050	<0.0000050	<0.0000050
Chromium (Cr)	mg/L	0.00010-0.00050	<0.00020	<0.00050	<0.00050	<0.00050	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00050
Cobalt (Co)	mg/L	0.000050-0.00010	<0.00010	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050	<0.00010	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050
Copper (Cu)	mg/L	0.00010-0.00050	<0.00010	<0.00050	<0.00050	<0.00050	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010	<0.00050	<0.00050	<0.00050
Gallium (Ga)	mg/L	0.000050	-	<0.000050	<0.000050	<0.000050	-	<0.000050	-	-	-	<0.000050	<0.000050	<0.000050
Iron (Fe)	mg/L	0.010-0.030	<0.010	<0.030	<0.030	<0.030	<0.010	<0.030	<0.010	<0.010	<0.010	<0.030	<0.030	<0.030
Lead (Pb)	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)	mg/L	0.00020-0.0050	<0.0050	<0.00020	<0.00020	<0.00020	<0.0050	<0.00020	<0.0050	<0.0050	<0.0050	<0.00020	<0.00020	<0.00020
Magnesium (Mg)	mg/L	0.0050-0.10	<0.0050	<0.10	<0.10	<0.10	<0.0050	<0.10	<0.0050	<0.0050	<0.0050	<0.10	<0.10	<0.10
Manganese (Mn)	mg/L	0.000050-0.00020	<0.000050	<0.00020	<0.00020	<0.00020	<0.000050	<0.00020	<0.000050	<0.000050	<0.000050	<0.00020	<0.00020	<0.00020
Mercury (Hg)	mg/L	0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000050	<0.000010	<0.000010
Molybdenum (Mo)	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel (Ni)	mg/L	0.00010-0.00020	<0.00010	<0.00020	<0.00020	<0.00020	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020
Phosphorus (P)	mg/L	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)	mg/L	0.050-2.0	<0.050	<2.0	<2.0	<2.0	<0.050	<2.0	<0.050	<0.050	<0.050	<2.0	<2.0	<2.0
Rhenium (Re)	mg/L	0.0000050	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-	-	-	<0.0000050	<0.0000050	<0.0000050
Rubidium (Rb)	mg/L	0.000020	-	<0.000020	<0.000020	<0.000020	-	<0.000020	-	-	-	<0.000020	<0.000020	<0.000020
Selenium (Se)	mg/L	0.00010-0.0010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Silver (Ag)	mg/L	0.0000050-0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.000010	<0.0000050	<0.000010	<0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050
Sodium (Na)	mg/L	0.010-2.0	<0.010	<2.0	<2.0	<2.0	<0.010	<2.0	<0.010	<0.010	<0.010	<2.0	<2.0	<2.0
Strontium (Sr)	mg/L	0.000050-0.00010	<0.00010	<0.000050	<0.000050	<0.000050	<0.00010	<0.000050	<0.00010	<0.00010	<0.00010	<0.000050	0.000273	<0.000050

a) RDL = Realized detection limit

Appendix 3.2-2. Water Quality QA/QC Results, Hope Bay Belt Project, 2010

Site Abbreviation:			Equipment Blank	Equipment Blank	Travel Blank	Field Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Field Blank	Field Blank	Equipment Blank	Field Blank	Field Blank
Date Sampled:			18-Apr-10	18-Apr-10	18-Apr-10	22-Apr-10	25-Apr-10	17-Jun-10	17-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	08-Aug-10	10-Aug-10	13-Aug-10
ALS Sample ID:	Units	RDL ^a	L879372-5	L879380-1	L879380-2	L880317-7	L880485-10	L899505-5	L899508-5	L900028-30	L900028-32	L900033-3	L919821-1	L919821-7	L921162-7
Total Metals (continued)															
Tellurium (Te)	mg/L	0.000010	-	<0.000010	<0.000010	<0.000010	-	<0.000010	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Thallium (Tl)	mg/L	0.0000020-0.00010	<0.00010	<0.0000020	<0.0000020	<0.0000020	<0.00010	<0.0000020	<0.00010	<0.00010	<0.00010	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Thorium (Th)	mg/L	0.0000050	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Tin (Sn)	mg/L	0.00010-0.00020	<0.00010	<0.00020	<0.00020	<0.00020	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020
Titanium (Ti)	mg/L	0.00020-0.010	<0.010	<0.00020	<0.00020	<0.00020	<0.010	<0.00020	<0.010	<0.010	<0.010	<0.00020	<0.00020	<0.00020	<0.00020
Tungsten (W)	mg/L	0.000010	-	<0.000010	<0.000010	<0.000010	-	<0.000010	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010
Uranium (U)	mg/L	0.0000020-0.000010	<0.000010	<0.0000020	<0.0000020	<0.0000020	<0.000010	<0.0000020	<0.000010	<0.000010	<0.000010	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Vanadium (V)	mg/L	0.000050-0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00020	<0.00020	<0.000050	<0.000050	<0.000050	<0.000050
Yttrium (Y)	mg/L	0.0000050	-	<0.0000050	<0.0000050	<0.0000050	-	<0.0000050	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Zinc (Zn)	mg/L	0.0010-0.0030	<0.0010	<0.0030	<0.0030	<0.0030	<0.0010	<0.0030	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	<0.0030	<0.0030
Zirconium (Zr)	mg/L	0.000050	-	<0.000050	<0.000050	<0.000050	-	<0.000050	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050
Dissolved Metals															
Aluminum (Al)	mg/L	0.0010-0.0030	<0.0010	-	-	-	<0.0010	-	<0.0010	<0.0010	<0.0010	-	-	-	<0.0030
Antimony (Sb)	mg/L	0.000010-0.00010	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.000010
Arsenic (As)	mg/L	0.000030-0.000050	<0.000030	-	-	-	<0.000030	-	<0.000030	<0.000050	<0.000050	-	-	-	<0.000050
Barium (Ba)	mg/L	0.000050-0.00010	<0.000050	-	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050	-	-	-	<0.00010
Beryllium (Be)	mg/L	0.0000050-0.00020	<0.00020	-	-	-	<0.00020	-	<0.00020	<0.00020	<0.00020	-	-	-	<0.0000050
Bismuth (Bi)	mg/L	0.000050-0.00050	<0.00050	-	-	-	<0.00050	-	<0.00050	<0.00050	<0.00050	-	-	-	<0.000050
Boron (B)	mg/L	0.0010-0.0050	0.0015	-	-	-	<0.0010	-	<0.0050	<0.0050	<0.0050	-	-	-	<0.0050
Cadmium (Cd)	mg/L	0.0000050-0.000010	<0.000010	-	-	-	<0.000010	-	<0.000010	<0.000010	<0.000010	-	-	-	<0.0000050
Calcium (Ca)	mg/L	0.02-0.05	<0.020	-	-	-	<0.020	-	<0.020	<0.020	<0.020	-	-	-	<0.050
Cesium (Cs)	mg/L	0.0000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000050
Chromium (Cr)	mg/L	0.00010-0.00050	<0.00020	-	-	-	<0.00020	-	<0.00020	<0.00020	<0.00020	-	-	-	<0.00050
Cobalt (Co)	mg/L	0.000050-0.00010	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.000050
Copper (Cu)	mg/L	0.00010-0.00050	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.00050
Gallium (Ga)	mg/L	0.000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050
Iron (Fe)	mg/L	0.010-0.030	<0.010	-	-	-	<0.010	-	<0.010	<0.010	<0.010	-	-	-	<0.030
Lead (Pb)	mg/L	0.000050	<0.000050	-	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050	-	-	-	<0.000050
Lithium (Li)	mg/L	0.00020-0.0050	<0.0050	-	-	-	<0.0050	-	<0.0050	<0.0050	<0.0050	-	-	-	<0.00020
Magnesium (Mg)	mg/L	0.0050-0.10	<0.0050	-	-	-	<0.0050	-	<0.0050	<0.0050	<0.0050	-	-	-	<0.10
Manganese (Mn)	mg/L	0.000050-0.00020	<0.000050	-	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050	-	-	-	<0.00020
Mercury (Hg)	mg/L	0.000010	<0.000010	-	-	-	<0.000010	-	<0.000010	<0.000010	<0.000010	-	-	-	<0.000010
Molybdenum (Mo)	mg/L	0.000050	<0.000050	-	-	-	<0.000050	-	<0.000050	<0.000050	<0.000050	-	-	-	<0.000050
Nickel (Ni)	mg/L	0.00010-0.00020	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.00020
Phosphorus (P)	mg/L	0.30	<0.30	-	-	-	<0.30	-	<0.30	<0.30	<0.30	-	-	-	<0.30
Potassium (K)	mg/L	0.050-2.0	<0.050	-	-	-	<0.050	-	<0.050	<0.050	<0.050	-	-	-	<2.0
Rhenium (Re)	mg/L	0.0000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000050
Rubidium (Rb)	mg/L	0.000020	-	-	-	-	-	-	-	-	-	-	-	-	<0.000020
Selenium (Se)	mg/L	0.00010-0.00020	<0.00020	-	-	-	<0.00020	-	<0.00010	<0.00020	<0.00020	-	-	-	<0.00020
Silicon (Si)	mg/L	0.050	<0.050	-	-	-	<0.050	-	<0.050	<0.050	<0.050	-	-	-	<0.050
Silver (Ag)	mg/L	0.0000050-0.000010	<0.000010	-	-	-	<0.000010	-	<0.000010	<0.000010	<0.000010	-	-	-	<0.0000050
Sodium (Na)	mg/L	0.010-2.0	<0.010	-	-	-	<0.010	-	<0.010	<0.010	<0.010	-	-	-	<2.0
Strontium (Sr)	mg/L	0.000050-0.00010	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.000050
Tellurium (Te)	mg/L	0.000010	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010
Thallium (Tl)	mg/L	0.0000020-0.00010	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.0000020
Thorium (Th)	mg/L	0.0000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000050
Tin (Sn)	mg/L	0.00010-0.00020	<0.00010	-	-	-	<0.00010	-	<0.00010	<0.00010	<0.00010	-	-	-	<0.00020
Titanium (Ti)	mg/L	0.00020-0.010	<0.010	-	-	-	<0.010	-	<0.010	<0.010	<0.010	-	-	-	<0.00020
Tungsten (W)	mg/L	0.000010	-	-	-	-	-	-	-	-	-	-	-	-	<0.000010
Uranium (U)	mg/L	0.0000020-0.000010	<0.000010	-	-	-	<0.000010	-	<0.000010	<0.000010	<0.000010	-	-	-	<0.0000020
Vanadium (V)	mg/L	0.000050-0.00020	<0.000050	-	-	-	<0.000050	-	<0.000050	<0.00020	<0.00020	-	-	-	<0.000050
Yttrium (Y)	mg/L	0.0000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.0000050
Zinc (Zn)	mg/L	0.0010-0.0030	<0.0010	-	-	-	<0.0010	-	<0.0010	<0.0010	<0.0010	-	-	-	<0.0030
Zirconium (Zr)	mg/L	0.000050	-	-	-	-	-	-	-	-	-	-	-	-	<0.000050
Organic Parameters															
Microcystin	µg/L	0.20	-	-	-	-	-	-	-	-	-	-	-	-	-
Radiochemistry															
Radium-226	Bq/L	0.005-0.007	-	<0.007	<0.007	0.008	-	-	-	-	-	-	<0.005	-	-

a) RDL = Realized detection limit

Appendix 3.2-2. Water Quality QA/QC Results, Hope Bay Belt Project, 2010

Site Abbreviation:			Field Blank	Field Blank	Travel Blank	Travel Blank	Equipment Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Travel Blank	Field Blank
Date Sampled:			14-Aug-10	14-Aug-10	15-Aug-10	18-Aug-10	21-Aug-10	24-Aug-10	24-Aug-10	12-Sep-10	15-Sep-10	15-Sep-10	16-Sep-10
ALS Sample ID:	Units	RDL ^a	L921173-5	L921179-4	L921923-3	L923023-7	L926333-5	L926334-3	L926334-4	L930857-6	L932990-9	L932990-10	L933177-23
Physical Tests													
Conductivity	µS/cm	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hardness (as CaCO ₃)	mg/L	0.5-1.0	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
pH	pH	0.1	5.69	5.81	5.82	5.79	5.86	5.67	5.76	5.43	5.75	5.57	5.52
Total Suspended Solids	mg/L	3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	mg/L	10	<10	<10	<10	<10	<10	<10	<10	-	-	-	<10
Turbidity	NTU	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Anions and Nutrients													
Acidity (as CaCO ₃)	mg/L	1.0	-	-	-	-	2.9	2.7	2.6	-	-	-	-
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	<2.0
Alkalinity, Carbonate (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	<2.0
Alkalinity, Hydroxide (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	<2.0
Alkalinity, Total (as CaCO ₃)	mg/L	2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Ammonia as N	mg/L	0.0050	0.0070	<0.0050	<0.0050	<0.0050	<0.0050	0.0186	<0.0050	-	<0.0050	<0.0050	0.0088
Bromide (Br)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Fluoride (F)	mg/L	0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nitrate (as N)	mg/L	0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	-	-	<0.050	<0.050
Ortho Phosphate as P	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-	-	-	<0.0010
Total Phosphorus	mg/L	0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Sulphate (SO ₄)	mg/L	0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Cyanides													
Cyanide, Total	mg/L	0.0010	-	-	-	-	-	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	-
Organic / Inorganic Carbon													
Total Organic Carbon	mg/L	0.20-0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	-	<0.50	0.257	0.74
Total Metals													
Aluminum (Al)	mg/L	0.0010-0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010
Antimony (Sb)	mg/L	0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00010
Arsenic (As)	mg/L	0.000030-0.00010	-	<0.00010	<0.000030	<0.000030	<0.000030	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000030
Barium (Ba)	mg/L	0.000050-0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050
Beryllium (Be)	mg/L	0.0000050-0.00020	-	<0.00020	<0.00020	<0.00020	<0.00020	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.00020
Bismuth (Bi)	mg/L	0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00050
Boron (B)	mg/L	0.0010-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cadmium (Cd)	mg/L	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000010
Calcium (Ca)	mg/L	0.02-0.05	<0.020	<0.020	<0.020	<0.020	<0.020	<0.050	<0.050	<0.050	<0.050	<0.050	<0.020
Cesium (Cs)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-
Chromium (Cr)	mg/L	0.00010-0.00050	-	<0.00050	<0.00010	<0.00010	<0.00010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00010
Cobalt (Co)	mg/L	0.000050-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010
Copper (Cu)	mg/L	0.00010-0.00050	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00010
Gallium (Ga)	mg/L	0.000050	-	-	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-
Iron (Fe)	mg/L	0.010-0.030	<0.010	<0.010	<0.010	<0.010	<0.010	<0.030	<0.030	<0.030	<0.030	<0.030	<0.010
Lead (Pb)	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000104	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)	mg/L	0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0050
Magnesium (Mg)	mg/L	0.0050-0.10	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	<0.10	<0.10	<0.10	<0.10	<0.10	<0.0050
Manganese (Mn)	mg/L	0.000050-0.00020	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.000050
Mercury (Hg)	mg/L	0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)	mg/L	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Nickel (Ni)	mg/L	0.00010-0.00020	-	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00010
Phosphorus (P)	mg/L	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)	mg/L	0.050-2.0	<0.050	<0.050	<0.050	<0.050	<0.050	<2.0	<2.0	<2.0	<2.0	<2.0	<0.050
Rhenium (Re)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-
Rubidium (Rb)	mg/L	0.000020	-	-	-	-	-	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	-
Selenium (Se)	mg/L	0.00010-0.0010	-	<0.0010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00010
Silicon (Si)	mg/L	0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Silver (Ag)	mg/L	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000010
Sodium (Na)	mg/L	0.010-2.0	-	<0.010	<0.010	<0.010	0.020	<2.0	<2.0	<2.0	<2.0	<2.0	<0.010
Strontium (Sr)	mg/L	0.000050-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.00010

a) RDL = Realized detection limit

Appendix 3.2-2. Water Quality QA/QC Results, Hope Bay Belt Project, 2010

Site Abbreviation:			Field Blank	Field Blank	Travel Blank	Travel Blank	Equipment Blank	Field Blank	Travel Blank	Travel Blank	Field Blank	Travel Blank	Field Blank
Date Sampled:			14-Aug-10	14-Aug-10	15-Aug-10	18-Aug-10	21-Aug-10	24-Aug-10	24-Aug-10	12-Sep-10	15-Sep-10	15-Sep-10	16-Sep-10
ALS Sample ID:	Units	RDL ^a	L921173-5	L921179-4	L921923-3	L923023-7	L926333-5	L926334-3	L926334-4	L930857-6	L932990-9	L932990-10	L933177-23
Total Metals													
Tellurium (Te)	mg/L	0.000010	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-
Thallium (Tl)	mg/L	0.0000020-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.00010
Thorium (Th)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-
Tin (Sn)	mg/L	0.00010-0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00010
Titanium (Ti)	mg/L	0.00020-0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.010
Tungsten (W)	mg/L	0.000010	-	-	-	-	-	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	-
Uranium (U)	mg/L	0.0000020-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.000010
Vanadium (V)	mg/L	0.000050-0.0010	-	<0.0010	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Yttrium (Y)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	-
Zinc (Zn)	mg/L	0.0010-0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0030	<0.0030	<0.0030	<0.0030	<0.0030	<0.0010
Zirconium (Zr)	mg/L	0.000050	-	-	-	-	-	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	-
Dissolved Metals													
Aluminum (Al)	mg/L	0.0010-0.0030	<0.0010	-	-	<0.0010	<0.0010	<0.0030	-	-	-	-	<0.0010
Antimony (Sb)	mg/L	0.000010-0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.000010	-	-	-	-	<0.00010
Arsenic (As)	mg/L	0.000030-0.000050	<0.000030	-	-	<0.000030	<0.000030	<0.000050	-	-	-	-	<0.000030
Barium (Ba)	mg/L	0.000050-0.00010	<0.000050	-	-	<0.000050	<0.000050	<0.00010	-	-	-	-	<0.000050
Beryllium (Be)	mg/L	0.0000050-0.00020	<0.00020	-	-	<0.00020	<0.00020	<0.0000050	-	-	-	-	<0.00020
Bismuth (Bi)	mg/L	0.000050-0.00050	<0.00050	-	-	<0.00050	<0.00050	<0.000050	-	-	-	-	<0.00050
Boron (B)	mg/L	0.0010-0.0050	<0.0050	-	-	<0.0050	0.0014	<0.0050	-	-	-	-	<0.0050
Cadmium (Cd)	mg/L	0.0000050-0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.0000050	-	-	-	-	<0.000010
Calcium (Ca)	mg/L	0.02-0.05	<0.020	-	-	<0.020	<0.020	<0.050	-	-	-	-	<0.020
Cesium (Cs)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	-	-	-	-	-
Chromium (Cr)	mg/L	0.00010-0.00050	<0.00010	-	-	<0.00010	<0.00010	<0.00050	-	-	-	-	<0.00010
Cobalt (Co)	mg/L	0.000050-0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.000050	-	-	-	-	<0.00010
Copper (Cu)	mg/L	0.00010-0.00050	<0.00010	-	-	<0.00010	<0.00010	<0.00050	-	-	-	-	<0.00010
Gallium (Ga)	mg/L	0.000050	-	-	-	-	-	<0.000050	-	-	-	-	-
Iron (Fe)	mg/L	0.010-0.030	<0.010	-	-	<0.010	<0.010	<0.030	-	-	-	-	<0.010
Lead (Pb)	mg/L	0.000050	<0.000050	-	-	<0.000050	<0.000050	<0.000050	-	-	-	-	<0.000050
Lithium (Li)	mg/L	0.00020-0.0050	<0.0050	-	-	<0.0050	<0.0050	<0.00020	-	-	-	-	<0.0050
Magnesium (Mg)	mg/L	0.0050-0.10	<0.0050	-	-	<0.0050	<0.0050	<0.10	-	-	-	-	<0.0050
Manganese (Mn)	mg/L	0.000050-0.00020	<0.000050	-	-	<0.000050	<0.000050	<0.00020	-	-	-	-	<0.000050
Mercury (Hg)	mg/L	0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.000010	-	-	-	-	<0.000010
Molybdenum (Mo)	mg/L	0.000050	<0.000050	-	-	<0.000050	<0.000050	<0.000050	-	-	-	-	<0.000050
Nickel (Ni)	mg/L	0.00010-0.00020	<0.00010	-	-	<0.00010	<0.00010	<0.00020	-	-	-	-	<0.00010
Phosphorus (P)	mg/L	0.30	<0.30	-	-	<0.30	<0.30	<0.30	-	-	-	-	<0.30
Potassium (K)	mg/L	0.050-2.0	<0.050	-	-	<0.050	<0.050	<2.0	-	-	-	-	<0.050
Rhenium (Re)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	-	-	-	-	-
Rubidium (Rb)	mg/L	0.000020	-	-	-	-	-	<0.000020	-	-	-	-	-
Selenium (Se)	mg/L	0.00010-0.00020	<0.00010	-	-	<0.00010	<0.00010	<0.00020	-	-	-	-	<0.00010
Silicon (Si)	mg/L	0.050	<0.050	-	-	<0.050	<0.050	<0.050	-	-	-	-	<0.050
Silver (Ag)	mg/L	0.0000050-0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.0000050	-	-	-	-	<0.000010
Sodium (Na)	mg/L	0.010-2.0	<0.010	-	-	<0.010	0.018	<2.0	-	-	-	-	<0.010
Strontium (Sr)	mg/L	0.000050-0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.000050	-	-	-	-	<0.00010
Tellurium (Te)	mg/L	0.000010	-	-	-	-	-	<0.000010	-	-	-	-	-
Thallium (Tl)	mg/L	0.0000020-0.00010	<0.00010	-	-	<0.00010	<0.00010	<0.0000020	-	-	-	-	<0.00010
Thorium (Th)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	-	-	-	-	-
Tin (Sn)	mg/L	0.00010-0.00020	<0.00010	-	-	<0.00010	<0.00010	<0.00020	-	-	-	-	<0.00010
Titanium (Ti)	mg/L	0.00020-0.010	<0.010	-	-	<0.010	<0.010	<0.00020	-	-	-	-	<0.010
Tungsten (W)	mg/L	0.000010	-	-	-	-	-	<0.000010	-	-	-	-	-
Uranium (U)	mg/L	0.0000020-0.000010	<0.000010	-	-	<0.000010	<0.000010	<0.0000020	-	-	-	-	<0.000010
Vanadium (V)	mg/L	0.000050-0.00020	<0.000050	-	-	<0.000050	<0.000050	<0.000050	-	-	-	-	<0.000050
Yttrium (Y)	mg/L	0.0000050	-	-	-	-	-	<0.0000050	-	-	-	-	-
Zinc (Zn)	mg/L	0.0010-0.0030	<0.0010	-	-	<0.0010	<0.0010	<0.0030	-	-	-	-	<0.0010
Zirconium (Zr)	mg/L	0.000050	-	-	-	-	-	<0.000050	-	-	-	-	-
Organic Parameters													
Microcystin	µg/L	0.20	-	-	-	-	<0.20	-	-	-	-	-	-
Radiochemistry													
Radium-226	Bq/L	0.005-0.007	-	-	-	-	-	-	-	-	-	-	-

a) RDL = Realized detection limit

Appendix 3.3-1

Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:			Koig. U/S	Koig. U/S	Aim. OF	Koig. R.	Koig. R.	Koig. D/S	Koig. D/S	Koig. U/S	Koig. U/S	Aim. R.	Aim. R.	Trout OF	Trout OF	AWRa	AWRa	AWRb	AWRb	AWRc	AWRc	AWRd	AWRd	AWRe	AWRe	
Depth Zone:			Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	
Replicate:			1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
Date Sampled:			18-Apr-10	18-Apr-10	25-Apr-10	25-Apr-10	25-Apr-10	17-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	
ALS Sample ID:	Units	CCME Guideline for the Protection of Freshwater Aquatic Life ^a	RDL ^h	L879372-1	L879372-2	L880485-1	L880485-8	L880485-9	L899508-1	L899508-2	L899508-3	L899508-4	L900028-1	L900028-2	L900028-3	L900028-4	L900028-13	L900028-14	L900028-15	L900028-16	L900028-17	L900028-18	L900028-19	L900028-20	L900028-21	L900028-22
Physical Tests																										
Conductivity	µS/cm		2.0	169	170	66.3	70.9	70.3	53.9	54.1	55.8	59.7	27.8	28.0	38.9	39.0	126	124	77.5	76.7	47.8	47.7	97.6	97.4	80.8	80.5
Hardness (as CaCO ₃)	mg/L		0.50	45.4	47.0	16.8	18.0	17.7	14.1	14.1	17.1	18.9	8.09	7.72	15.0	14.7	20.5	20.7	16.6	16.8	12.5	13.0	20.0	19.9	22.6	22.9
pH		6.5-9.0	0.10	7.22	7.36	7.13	6.93	7.16	7.56	7.66	7.36	7.46	6.93	6.98	7.33	7.33	7.28	7.29	7.33	7.36	7.30	7.29	7.42	7.39	7.43	7.35
Total Suspended Solids	mg/L	dependent on background levels	3.0	15.2	10.7	<3.0	<3.0	<3.0	17.5	14.5	4.5	3.5	<3.0	<3.0	<3.0	<3.0	38.5	38.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0
Total Dissolved Solids	mg/L		10	107	110	41	40	39	44	44	45	50	24	22	33	30	99	92	51	54	33	37	56	66	64	58
Turbidity	NTU	dependent on background levels	0.10	3.13	3.19	0.37	0.52	0.52	15.4	15.6	6.63	5.04	1.76	1.54	1.37	1.44	40.8	41.1	2.04	2.23	1.30	1.29	1.24	1.15	0.25	0.27
Anions and Nutrients																										
Acidity (as CaCO ₃)	mg/L		1.0																							
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L		1.0-2.0	33.6	33.8	10.9	11.9	11.8	16.0	17.1	13.4	16.3	5.2	5.2	13.2	13.3	12.5	12.3	13.2	13.2	10.4	10.3	15.6	16.1	17.5	17.7
Alkalinity, Carbonate (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO ₃)	mg/L		1.0-2.0	33.6	33.8	10.9	11.9	11.8	16.0	17.1	13.4	16.3	5.2	5.2	13.2	13.3	12.5	12.3	13.2	13.2	10.4	10.3	15.6	16.1	17.5	17.7
Ammonia as N	mg/L	pH- and temperature-dependent	0.0050-0.010	0.0151	0.0117	<0.0050	<0.0050	<0.0050	0.0190	0.0182	0.0129	0.0108	0.0216	0.0203	0.0156	0.0154	0.0110	0.0102	0.0245	0.0217	0.0147	0.0145	0.0197	0.0177	<0.0050	<0.0050
Bromide (Br)	mg/L		0.050-0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.059	0.060	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L		0.50-2.50	27.3	27.3	11.1	12.3	12.4	7.98	8.01	6.90	6.19	4.23	4.22	2.90	2.89	29.3	29.3	14.7	14.6	7.68	7.70	19.2	19.1	13.5	13.5
Fluoride (F)	mg/L		0.020-0.10	0.046	0.047	0.028	0.025	0.027	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.024	0.023	0.068	0.068	0.036	0.036	0.028	0.028	0.032	0.034	0.051	0.050
Nitrate (as N)	mg/L	2.9	0.0050-0.025	0.323	0.323	0.0298	0.0333	0.0347	0.0082	0.0083	<0.0050	<0.0050	0.0100	0.0093	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	0.0010-0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L		0.050	0.450	0.524	0.284	0.340	0.206	0.187	0.260	<0.050	0.235	0.423	0.544	0.661	0.465	0.980	0.989	0.577	0.604	0.631	0.506	0.529	0.720	0.735	0.942
Ortho Phosphate as P	mg/L		0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0018	<0.0010	<0.0010
Total Phosphorus	mg/L		0.0020	0.0201	0.0187	0.0074	0.0099	0.0094	0.0290	0.0302	0.0176	0.0147	0.0115	0.0115	0.0099	0.0101	0.0574	0.0624	0.0152	0.0154	0.0128	0.0120	0.0145	0.0151	0.0069	0.0079
Sulphate (SO ₄)	mg/L		0.50-2.5	4.63	4.62	1.78	1.91	1.91	1.17	1.18	1.20	1.29	1.09	1.08	0.95	0.95	0.68	0.68	<0.50	<0.50	<0.50	<0.50	0.96	0.95	<0.50	<0.50
Organic / Inorganic Carbon																										
Total Organic Carbon	mg/L		0.20-0.50	9.58	9.67	6.60	6.18	6.40	4.93	4.99	6.91	7.12	3.86	4.26	5.49	5.70	10.9	9.20	6.42	6.64	5.81	5.81	6.48	5.93	9.99	10.2
Total Metals																										
Aluminum (Al)	mg/L	0.005-0.1 ^b	0.0010-0.0030	0.378	0.217	0.0192	0.0203	0.0210	0.777	0.798	0.333	0.274	0.0800	0.0737	0.0786	0.0799	2.05	1.92	0.102	0.101	0.0531	0.0690	0.0321	0.0321	0.0381	0.0450
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)	mg/L	0.005	0.000050-0.000250	0.00049	0.00043	0.00014	0.00016	0.00017	0.000229	0.000237	0.000198	0.000200	0.000096	0.000087	0.000093	0.000089	0.00044	0.00043	0.000121	0.000134	0.000109	0.000089	0.00011	0.00013	0.000138	0.000150
Barium (Ba)	mg/L		0.000050-0.00010	0.0110	0.00964	0.00224	0.00250	0.00254	0.00929	0.00972	0.00549	0.00508	0.00295	0.00291	0.00366	0.00354	0.0237	0.0232	0.00324	0.00320	0.00279	0.00279	0.00316	0.00324	0.00376	0.00371
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L		0.0010-0.0050	0.0142	0.0134	0.0074	0.0072	0.0070	0.0121	0.0128	0.0146	0.0159	0.0086	0.0085	0.0095	0.0088	0.0138	0.0134	0.0127	0.0116	0.0111	0.0109	0.0161	0.0164		

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:				Koig. U/S	Koig. U/S	Aim. OF	Koig. R.	Koig. R.	Koig. D/S	Koig. D/S	Koig. U/S	Koig. U/S	Aim. R.	Aim. R.	Trout OF	Trout OF	AWRa	AWRa	AWRb	AWRb	AWRc	AWRc	AWRd	AWRd	AWRe	AWRe
Depth Zone:				Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Replicate:		CCME Guideline		1	2	1	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Date Sampled:		for the Protection		18-Apr-10	18-Apr-10	25-Apr-10	25-Apr-10	25-Apr-10	17-Jun-10	17-Jun-10	17-Jun-10	17-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10
ALS Sample ID:	Units	of Freshwater Aquatic Life ^a	RDL ^b	L879372-1	L879372-2	L880485-1	L880485-8	L880485-9	L899508-1	L899508-2	L899508-3	L899508-4	L900028-1	L900028-2	L900028-3	L900028-4	L900028-13	L900028-14	L900028-15	L900028-16	L900028-17	L900028-18	L900028-19	L900028-20	L900028-21	L900028-22
Total Metals (continued)																										
Thallium (Tl)	mg/L	0.0008	0.0000020-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)	mg/L		0.00010-0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)	mg/L		0.00020-0.010	0.017	<0.010	<0.010	<0.010	<0.010	0.037	0.038	0.014	0.012	<0.010	<0.010	<0.010	<0.010	0.108	0.099	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L		0.0000020-0.000010	0.000091	0.000078	0.000030	0.000034	0.000036	0.000065	0.000069	0.000044	0.000043	0.000025	0.000024	0.000022	0.000024	0.000149	0.000148	0.000018	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	0.000011	0.000012
Vanadium (V)	mg/L		0.000050-0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	0.00173	0.00178	0.00074	0.00062	0.00025	0.00021	0.00021	0.00021	0.00404	0.00394	0.00022	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Zinc (Zn)	mg/L	0.03	0.0010-0.0040	0.0029	0.0032	<0.0010	0.0016	0.0021	0.0024	0.0024	0.0026	0.0029	<0.0010	<0.0010	0.0010	0.0011	0.0047	0.0051	0.0011	0.0010	0.0011	0.0084	<0.0010	<0.0010	0.0017	0.0020
Dissolved Metals																										
Aluminum (Al)	mg/L		0.0010-0.0030	0.0289	0.0301	0.0078	0.0091	0.0086	0.0342	0.0314	0.0417	0.0538	0.0160	0.0132	0.0618	0.0212	0.150	0.114	0.0325	0.0249	0.0135	0.0133	0.0090	0.0093	0.0335	0.0342
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)	mg/L		0.000030-0.00010	0.00038	0.00039	0.000169	0.000197	0.000187	0.000144	0.000133	0.000149	0.000177	0.000097	0.000095	0.000111	0.000093	0.00031	0.00030	0.000134	0.000136	0.000105	0.000099	0.00015	0.00014	0.000156	0.000158
Barium (Ba)	mg/L		0.000050-0.00010	0.00738	0.00787	0.00204	0.00241	0.00238	0.00190	0.00189	0.00241	0.00258	0.00219	0.00207	0.00291	0.00289	0.00461	0.00421	0.00237	0.00220	0.00220	0.00221	0.00281	0.00286	0.00353	0.00351
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L		0.0010-0.010	0.0124	0.0136	0.0055	0.0055	0.0058	0.0095	0.0091	0.0118	0.0128	0.0074	0.0083	0.0073	0.0083	0.0121	0.0127	0.0104	0.0100	0.0098	0.0095	0.0136	0.0131	0.0094	0.0111
Cadmium (Cd)	mg/L		0.0000050-0.000010	<0.000010	<0.000010	<0.000010	0.000015	0.000011	<0.000010	<0.000010	0.000011	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca)	mg/L		0.02-0.05	10.2	10.4	3.45	3.66	3.64	3.27	3.22	3.83	4.20	1.61	1.50	4.44	4.36	2.80	2.84	3.38	3.41	2.63	2.70	4.45	4.43	5.42	5.52
Chromium (Cr)	mg/L		0.00010-0.00050	0.00053	0.00065	0.00018	0.00024	0.00019	0.00024	0.00025	0.00028	0.00030	<0.00020	<0.00020	0.00021	<0.00020	0.00047	0.00054	0.00023	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	0.00042	0.00037
Cobalt (Co)	mg/L		0.000050-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)	mg/L		0.00010-0.00050	0.00282	0.00291	0.00123	0.00135	0.00128	0.00125	0.00124	0.00167	0.00202	0.00089	0.00083	0.00117	0.00116	0.00205	0.00215	0.00089	0.00072	0.00043	0.00044	0.00076	0.00068	0.00109	0.00103
Iron (Fe)	mg/L		0.010-0.030	0.080	0.080	0.023	0.027	0.026	0.085	0.082	0.089	0.089	0.100	0.094	0.056	0.053	0.228	0.200	0.294	0.151	0.132	0.126	0.109	0.119	0.061	0.060
Lead (Pb)	mg/L		0.000050	<0.000050	0.000053	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000125	0.000111	0.000062	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)	mg/L		0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)	mg/L		0.0050-0.10	4.85	5.13	2.00	2.16	2.10	1.43	1.46	1.82	2.03	0.990	0.968	0.955	0.931	3.29	3.30	1.99	2.01	1.44	1.52	2.15	2.16	2.20	2.22
Manganese (Mn)	mg/L		0.000050-0.00020	0.0171	0.0195	0.000306	0.00173	0.00191	0.000941	0.000920	0.00115	0.00122	0.00306	0.000704	0.000723	0.000362	0.00113	0.00122	0.00669	0.00107	0.000260	0.000272	0.000487	0.000487	0.000202	0.000223
Mercury (Hg)	mg/L		0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)	mg/L		0.000050	0.000081	0.000064	0.000054	0.000057	0.000054	0.000061	0.000067	0.0000229	0.000335	<0.000050	<0.000050	0.000062	<0.000050	0.000121	0.000131	0.000076	0.000070	<0.000050	<0.000050	<0.000050	<0.000050	0.000084	0.000092
Nickel (Ni)	mg/L		0.00010-0.00020	0.00128	0.00128	0.00052	0.00059	0.00060	0.00056	0.00049	0.00064	0.00078	0.00046	0.00042	0.00071	0.00070	0.00181	0.00190	0.00089	0.00081	0.00037	0.00042	0.00042	0.00038	0.00125	0.00120
Phosphorus (P)	mg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)	mg/L		0.050-2.0	1.77	1.82	0.790	0.867	0.850	0.755	0.752	0.742	0.726	0.570	0.543	0.533	0.516	1.23	1.24	0.983	0.986	0.739	0.761	1.02	1.02	0.574	0.585
Selenium (Se)	mg/L		0.00010-0.0010	<0.00050	<0.00050	0.00011	0.00013	0.00013	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020
Silicon (Si)	mg/L		0.050	0.929	0.922	0.182	0.175	0.187	0.423	0.424	0.890	1.17	0.252	0.245	0.491	0.485	1.42	1.31	0.692	0.709	0.254	0.243	0.303	0.307	0.602	0.606
Silver (Ag)	mg/L		0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)	mg/L		0.010-2.0	13.7	14.2	5.72	6.48	6.24	4.56	4.53	4.24	4.16	2.20	2.15	1.84	1.79	13.3	13.6	7.09	7.16	4.04	4.23	10.7	10.8	7.47	7.61
Strontium (Sr)	mg/L		0.000050-0.00010	0.0417	0.0414	0.0160	0.0173	0.0171	0.0127	0.0127	0.0127	0.0126	0.00730	0.00721	0.0133	0.0133	0.0164	0.0165	0.0129	0.0128	0.00983	0.0100	0.0141	0.0144	0.0141	0.0142
Thallium (Tl)	mg/L		0.0000020-0.00010	<0.00010																						

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Abbreviation:				Koig. R. Surface	Koig. R. Surface	Ang. R. Ref. Surface	Ang. R. Ref. Surface	Stickleback OF Surface	Stickleback OF Surface	Aim. OF Surface	Aim. OF Surface	Aim. NE IF Surface	Aim. NE IF Surface	S12 Surface	S12 Surface	S6 Surface	S6 Surface	Koig. U/S Surface	Koig. U/S Surface	Koig. D/S Surface	Koig. D/S Surface	AWRa Surface	AWRa Surface	AWRb Surface	AWRb Surface	AWRc Surface	AWRc Surface		
Depth Zone:				1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2		
Replicate:	CCME Guideline for the Protection of Freshwater Aquatic Life ^a																												
Date Sampled:				18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	18-Jun-10	14-Aug-10	14-Aug-10	14-Aug-10	14-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10	15-Aug-10		
ALS Sample ID:	Units		RDL ^h	L900028-23	L900028-24	L900028-29	L900028-35	L900028-33	L900028-34	L901007-1	L901007-2	L901007-3	L901007-4	L901007-5	L901007-6	L901007-7	L901007-8	L921173-1	L921173-2	L921173-3	L921173-4	L921173-6	L921173-7	L921173-8	L921173-9	L921173-10	L921173-11		
Physical Tests																													
Conductivity	µS/cm		2.0	47.4	47.6	33.0	35.1	6.2	6.7	52.2	52.3	43.1	42.9	22.8	22.8	23.5	23.6	70.7	69.6	94.2	90.5	260	261	180	179	103	103		
Hardness (as CaCO ₃)	mg/L		0.50	13.3	13.2	8.86	9.07	2.22	2.34	13.1	13.1	9.60	9.55	7.98	8.04	7.94	7.99	17.3	17.5	21.3	20.3	52.8	52.0	30.0	29.5	34.3	34.6		
pH		6.5-9.0	0.10	7.21	7.17	6.98	8.14	6.37	6.04	7.10	7.12	7.03	7.01	7.03	7.03	6.89	6.79	7.08	7.21	7.34	7.37	7.55	7.60	7.51	7.17	7.55	7.55		
Total Suspended Solids	mg/L	dependent on background levels	3.0	<3.0	<3.0	<3.0	4.2	<3.0	<3.0	<3.0	<3.0	8.8	9.3	<3.0	<3.0	<3.0	<3.0	<3.0	3.5	5.0	3.0	3.0	<3.0	<3.0	<3.0	<3.0	6.5		
Total Dissolved Solids	mg/L		10	31	31	32	22	<10	<10	48	45	45	43	29	33	39	44	46	46	57	59	180	190	99	109	65	61		
Turbidity	NTU	dependent on background levels	0.10	1.35	1.73	2.70	4.44	0.43	0.36	1.98	1.88	9.36	9.73	0.69	0.71	0.28	0.29	2.37	2.55	4.52	4.55	20.9	21.2	3.32	3.50	2.05	2.09		
Anions and Nutrients																													
Acidity (as CaCO ₃)	mg/L		1.0																										
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L		1.0-2.0	9.3	9.3	5.9	5.8	<2.0	<2.0	8.9	8.7	6.6	6.9	6.8	6.6	5.7	5.7	11.8	11.9	13.0	13.0	36.0	35.6	19.7	19.8	34.0	34.1		
Alkalinity, Carbonate (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0			
Alkalinity, Hydroxide (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<1.0	<1.0	<2.0	<2.0	<2.0	<2.0			
Alkalinity, Total (as CaCO ₃)	mg/L		1.0-2.0	9.3	9.3	5.9	5.8	<2.0	<2.0	8.9	8.7	6.6	6.9	6.8	6.6	5.7	5.7	11.8	11.9	13.0	13.0	36.0	35.6	19.7	19.8	34.0	34.1		
Ammonia as N	mg/L	pH- and temperature-dependent	0.0050-0.010	0.0136	0.0129	0.0174	0.0174	0.0190	0.0183	0.0170	0.0169	0.0287	0.0278	0.0159	0.0164	0.0055	0.0054	<0.0050	<0.0050	<0.0050	<0.0050	0.0105	0.0117	<0.0050	<0.0050	0.0050	<0.0050		
Bromide (Br)	mg/L		0.050-0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.25	2.23	<0.050	<0.050	<0.050	<0.050		
Chloride (Cl)	mg/L		0.50-2.50	7.38	7.41	5.16	4.57	1.39	1.46	8.46	8.48	7.60	7.60	1.58	1.57	2.06	2.06	11.5	11.5	17.0	15.9	56.2	58.2	40.5	40.5	10.2	10.2		
Fluoride (F)	mg/L		0.020-0.10	0.022	0.023	<0.020	<0.020	<0.020	<0.020	0.024	0.024	0.023	0.023	0.023	0.024	0.037	0.037	0.025	0.025	0.026	0.025	<0.10	<0.10	0.040	0.039	0.033	0.035		
Nitrate (as N)	mg/L	2.9	0.0050-0.025	0.0194	0.0208	0.0071	0.0075	<0.0050	<0.0050	0.0379	0.0396	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.025	<0.025	<0.0050	<0.0050	<0.0050	<0.0050		
Nitrite (as N)	mg/L	0.06	0.0010-0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0050	<0.0050	<0.0010	<0.0010	<0.0010	<0.0010		
Total Kjeldahl Nitrogen	mg/L		0.050	0.504	0.429	0.364	0.351	<0.050	0.504	0.529	0.539	0.731	0.574	0.489	0.463	0.581	0.641	0.289	0.261	0.268	0.267	0.990	0.948	0.338	0.413	0.350	0.325		
Ortho Phosphate as P	mg/L		0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0012	0.0013	<0.0010	<0.0010	0.0010	<0.0010	<0.0010	0.0011	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	0.0027	0.0025	<0.0010	<0.0010	<0.0010	<0.0010		
Total Phosphorus	mg/L		0.0020	0.0112	0.0112	0.0113	0.0086	0.0055	0.0115	0.0096	0.0230	0.0225	0.0053	0.0067	0.0041	0.0033	0.0033	0.0117	0.0115	0.0132	0.0137	0.0358	0.0360	0.0151	0.0142	0.0064	0.0087		
Sulphate (SO ₄)	mg/L		0.50-2.5	1.47	1.46	1.31	0.95	<0.50	<0.50	1.57	1.59	0.88	0.89	1.05	1.05	0.83	0.83	1.92	1.90	3.19	3.04	<2.5	<2.5	0.60	0.61	<0.50	<0.50		
Organic / Inorganic Carbon																													
Total Organic Carbon	mg/L		0.20-0.50	5.12	5.08	4.04	4.14	0.90	1.00	4.08	4.57	5.25	5.41	4.67	4.57	5.26	7.90	5.73	5.70	5.82	5.96	18.0	17.1	7.08	7.02	7.20	7.18		
Total Metals																													
Aluminum (Al)	mg/L	0.005-0.1 ^b	0.0010-0.0030	0.0827	0.0851	0.170	0.177	0.0118	0.0132	0.0824	0.102	0.437	0.502	0.0679	0.0712	0.0867	0.0855	0.159	0.166	0.327	0.304	0.614	0.545	0.158	0.154	0.0225	0.0285		
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010		
Arsenic (As)	mg/L	0.005	0.000050-0.000250	0.000122	0.000128	0.000085	0.000078	<0.000050	<0.000050	0.000117	0.000132	0.000189	0.000206	<0.000050	<0.000050	0.000097	0.000075	0.000200	0.000222	0.000029	0.000227	0.00062	0.00057	0.00021	0.00021	0.00015	0.00017		
Barium (Ba)	mg/L		0.000050-0.00010	0.00262	0.00258	0.00390	0.00368	0.000506	0.000497	0.00294	0.00297	0.00595	0.00631	0.00317	0.00320	0.00311	0.00301	0.00331	0.00337	0.00520	0.00489	0.0130	0.0121	0.00439	0.00436	0.00506	0.00510		
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020		
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050		
Boron (B)	mg/L		0.0010-0.0050	0.0102	0.0113	0.0096	0.0143	0.0067	0.0077	0.0114	0.0129	0.0124	0.0132	0.0140	0.0104	0.0122	0.0113	0.0142	0.0142	0.0155	0.0154	0.0221	0.0214	0.0174	0.0176	0.0107	0.0109		
Cadmium (Cd)	mg/L	0.000017 ^{c,d}	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000015	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
Calcium (Ca)	mg/L		0.02-0.05	3.10	3.12	1.73	1.79	0.586	0.612	2.86	2.82	2.05	2.49	2.61	2.53	2.01	1.97	3.94	4.02	4.59	4.46	8.07	7.84	5.91	5.86	8.63	8.82		
Chromium (Cr)	mg/L	Cr(VI): 0.001 Cr(III): 0.0089 ^d	0.00020-0.00060	0.00034	0.00038	0.00049	0.00044	0.00026	<0.00020	<0.00060	<0.00060	0.00118	0.00120	<0.00040	<0.00040	<0.00060	<0.00060	0.00052	0.00057	0.00078	0.00071	0.00174	0.00173	<0.00050	0.00051	<0.00050	<0.00050		
Cobalt (Co)	mg/L		0.000050-0.00010	<0.00010	<0.00010	0.00010	0.00011	<0.00010	<0.00010	0.00014	0.00015	0.00029	0.00030	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00011	0.00012	0.00024	0.00023	<0.00010	<0.00010	0.00011	0.00012		
Copper (Cu)	mg/L	0.002-0.004 ^e	0.00010-0.0010	0.00114	0.00121	0.00112	0.00111	<0.00030	0.00028	0.00122	0.00122	0.00120	0.00126	0.00242	0.00256	0.00166	0.00149	0.00129	0.00138	0.00146	0.00159	0.00316	0.00302	0.00084	0.00082	0.00033	0.00031		
Iron (Fe)	mg/L	0.3	0.010-0.030	0.161	0.157	0.240	0.236	0.027	0.026	0.209	0.227	0.715	0.744	0.115	0.124	0.136	0.137	0.230	0.237	0.323	0.307	1.19	1.16	0.409	0.417	0.617	0.617		
Lead (Pb)	mg/L	0.001-0.007 ^f	0.000050	<0.000050	<0.000050	0.000059	0.000081	<0.000050	<0.000050	0.000065	0.000058	0.000180	0.000255	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000051	0.000093	0.000099	0.000304	0.000285	0.000056	0.000052	<0.000050	<0.000050		
Lithium (Li)	mg/L		0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.00												

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of freshwater aquatic life.

a) Canadian water quality guidelines for the protection of freshwater aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

b) 0.005 mg/L at pH <6.5; 0.1 mg/L at pH ≥ 6.5

c) Equation for correcting the guideline value for hardness = 10^{10.86[log(hardness)] - 3.2} / 1000

d) Interim guideline

e) 0.002 mg/L at [CaCO₃] = 0-120 mg/L; 0.003 mg/L at [CaCO₃] = 120-180 mg/L; =0.004 mg/L at [CaCO₃] = >180 mg/L

f) 0.001 mg/L at [CaCO₃] = 0-60 mg/L; 0.002 mg/L at [CaCO₃] = 60-120 mg/L; =0.004 mg/L at [CaCO₃] = 120-180 mg/L; 0.007 mg/L at [CaCO₃] = >180 mg/L

g) 0.025 mg/L at [CaCO₃] = 0-60 mg/L; 0.065 mg/L at [CaCO₃] = 60-120 mg/L; =0.110 mg/L at [CaCO₃] = 120-180 mg/L; 0.150 mg/L at [CaCO₃] = >180 mg/L

h) RDL = Realized detection limit

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:		Aim. NE IF	Aim. NE IF	Aim. OF	Aim. OF	Trout OF	Trout OF	Stickleback OF	Stickleback OF	AWRd	AWRd	S6	S6	AWRe	AWRe	Koig. R.	Koig. R.	Aim. R.	Ang. R. Ref.	Ang. R. Ref.	Koig. U/S	Koig. U/S	Koig. D/S	Koig. D/S
Depth Zone:		Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Replicate:		1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	
Date Sampled:		16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	16-Aug-10	18-Aug-10	18-Aug-10	18-Aug-10	18-Aug-10	18-Aug-10	18-Aug-10	21-Aug-10	15-Sep-10	15-Sep-10	15-Sep-10	15-Sep-10	15-Sep-10	
ALS Sample ID:	Units																							
Physical Tests																								
Conductivity	µS/cm	2.0																						
Hardness (as CaCO ₃)	mg/L	0.50																						
pH	pH	6.5-9.0																						
Total Suspended Solids	mg/L	dependent on background levels																						
Total Dissolved Solids	mg/L	10																						
Turbidity	NTU	dependent on background levels																						
Anions and Nutrients																								
Acidity (as CaCO ₃)	mg/L	1.0																3.3						
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L	1.0-2.0																9.0						
Alkalinity, Carbonate (as CaCO ₃)	mg/L	1.0-2.0																<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity, Hydroxide (as CaCO ₃)	mg/L	1.0-2.0																<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Alkalinity, Total (as CaCO ₃)	mg/L	1.0-2.0																9.0	11.8	11.7	14.5	14.6	16.0	
Ammonia as N	mg/L	pH- and temperature-dependent	0.0050-0.010	<0.0050	<0.0050	0.0057	0.0088	<0.0050	<0.0050	<0.0050	0.238	<0.0050	<0.0050	<0.0050	<0.0050	0.0094	0.0084	0.0103	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Bromide (Br)	mg/L	0.050-0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.216	0.250	<0.050	<0.050	0.053	
Chloride (Cl)	mg/L	0.50-2.50	18.7	18.7	7.48	7.44	10.2	10.3	50.0	18.0	17.9	4.70	4.67	18.4	18.9	7.22	6.76	6.26	51.5	51.4	26.7	36.6	27.6	
Fluoride (F)	mg/L	0.020-0.10	0.040	0.039	0.020	0.021	0.030	0.031	0.038	0.035	0.034	0.057	0.056	0.053	0.054	<0.020	<0.020	0.022	0.027	0.026	0.028	0.027	0.030	
Nitrate (as N)	mg/L	2.9	0.0050-0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0243	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0054	0.0133	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Nitrite (as N)	mg/L	0.06	0.0010-0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Kjeldahl Nitrogen	mg/L	0.050	0.691	0.744	0.228	0.201	0.372	0.405	0.295	0.304	0.454	0.378	0.395	0.810	0.718	0.277	0.271	0.214	0.343	0.374	0.390	0.371	0.428	
Ortho Phosphate as P	mg/L	0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	
Total Phosphorus	mg/L	0.0020	0.0472	0.0447	0.0079	0.0108	0.0147	0.0148	0.0137	0.0110	0.0113	0.0039	0.0029	0.0048	0.0046	0.0083	0.0093	0.0048	0.0117	0.0116	0.0196	0.0214	0.0309	
Sulphate (SO ₄)	mg/L	0.50-2.5	1.45	1.45	1.20	1.19	0.98	0.98	0.63	<0.50	<0.50	2.80	2.88	<0.50	<0.50	1.22	1.15	1.68	7.61	7.59	7.57	12.4	5.19	
Organic / Inorganic Carbon																								
Total Organic Carbon	mg/L	0.20-0.50	10.5	10.6	4.62	4.73	7.47	7.52	5.31	5.13	8.28	7.19	9.27	9.46	16.6	16.4	5.24	5.05	4.98	5.23	5.57	5.73	5.81	
Total Metals																								
Aluminum (Al)	mg/L	0.005-0.1 ^b	0.0010-0.0030	0.150	0.148	0.0501	0.0397	0.0854	0.0840	0.0217	0.0184	0.0111	0.0131	0.0317	0.0286	0.0400	0.0393	0.0532	0.0542	0.0227	0.317	0.321	0.695	
Antimony (Sb)	mg/L	0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	
Arsenic (As)	mg/L	0.00050-0.000250	0.00070	0.00097	0.000801	0.000783	0.000557	0.000652	0.000787	0.00082	0.00069	0.00070	0.00070	<0.00020	<0.00020	<0.00025	<0.00025	<0.00020	<0.00020	0.000116	0.00017	0.00020	0.00033	
Barium (Ba)	mg/L	0.000050-0.00010	0.00435	0.00431	0.00176	0.00175	0.00448	0.00456	0.00649	0.00660	0.00470	0.00460	0.00612	0.00581	0.00647	0.00639	0.00204	0.00205	0.00244	0.00613	0.00635	0.00937	0.00955	
Beryllium (Be)	mg/L	0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	
Bismuth (Bi)	mg/L	0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	
Boron (B)	mg/L	0.0010-0.0050	0.0138	0.0148	0.0109	0.0114	0.0109	0.0101	0.0194	0.0213	0.0132	0.0121	0.0085	0.0076	0.0080	0.0088	0.0123	0.0107	0.0073	0.0073	0.0209	0.0177	0.0193	
Cadmium (Cd)	mg/L	0.000017 ^{c,d}	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Calcium (Ca)	mg/L	0.02-0.05	4.56	4.48	2.48	2.42	7.14	6.95	18.9	6.88	6.83	6.72	6.56	12.5	12.8	3.52	3.75	2.86	4.47	4.34	5.81	6.23	5.76	
Chromium (Cr)	mg/L	Cr(VI): 0.001 Cr(III): 0.0089 ^d	0.00020-0.00060	0.00076	0.00071	<0.00050	<0.00050	0.00058	0.00063	<0.00050	<0.00050	<0.00050	<0.00050	0.00063	<0.00050	0.00077	0.00084	<0.00050	<0.00050	<0.00020	0.00090	0.00091	0.00142	
Cobalt (Co)	mg/L	0.000050-0.00010	0.00017	0.00017	<0.00010	<0.00010	0.00012	0.00010	0.00019	0.00020	0.00027	0.00026	<0.00010	<0.00010	0.00016	0.00013	<0.00010	<0.00010	<0.00010	0.00013	0.00013	0.00036	0.00043	
Copper (Cu)	mg/L	0.002-0.004 ^e	0.00010-0.0010	0.00178	0.00163	0.00098	0.00102	0.00141	0.00151	<0.00040	<0.00040	<0.00030	<0.00020	0.00102	0.00097	0.00051	0.00055	0.00105	0.00102	0.00117	0.00154	0.00149	0.00205	
Iron (Fe)	mg/L	0.3	0.010-0.030	0.805	0.800	0.094	0.073	0.383	0.382	0.624	0.611	1.22	1.23	0.422	0.341	0.284	0.258	0.107	0.108	0.150	0.450	0.463	0.647	
Lead (Pb)	mg/L	0.001-0.007 ^f	0.000050	0.000107	0.000091	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000101	0.000103	0.000250	
Lithium (Li)	mg/L	0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0051	0.0051	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	
Magnesium (Mg)	mg/L	0.0050-0.10	2.96	2.94	1.41	1.39	1.94	1.95	6.61	6.74	3.03	2.95	2.50	2.37	4.58	4.62	1.42	1.45	1.49	5.56	5.38	5.17	6.07	
Manganese (Mn)	mg/L	0.000050-0.00020	0.0185	0.0180	0.00753	0.00574	0.00690	0.00683	0.0404	0.0403	0.0517	0.0513	0.00294	0.00243	0.00545	0.00496	0.00817	0.00813	0.00410	0.00627	0.00613	0.0167	0.0189	
Mercury (Hg)	mg/L	Inorganic Mercury: 0.000026 Methylmercury: 0.000004 ^d	0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	
Molybdenum (Mo)	mg/L	0.073 ^d	0.000050	0.000192	0.000152	<0.000050	<0.000050	0.000056	0.000064	<0.000050	<0.000050	<0.000050	<0.000050	0.000065	0.000073	0.000062	0.000076	0.000052	0.000059	0.000051	0.000114	0.000091	0.000095	
Nickel (Ni)	mg/L	0.025-0.150 ^g	0.00010-0.00020	0.00105	0.00104	0.00041	0.00040	0.00102	0.00099	0.00062	0.00067	0.00055	0.00049	0.00084	0.00086	0.00207	0.00208	0.00039	0.00039	0.00068	0.00090	0.00092	0.00168	
Phosphorus (P)	mg/L	0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	
Potassium (K)	mg/L	0.050-2.0	0.911	0.897	0.678	0.671	0.483	0.481	1.58	1.61	0.517	0.509	0.421	0.406	0.075	0.071	0.670	0.675	0.563	1.73	1.68	1.31	1.43	
Selenium (Se)																								

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:				Aim. R.	Aim. R.	Aim. OF	Aim. OF	Koig. R.	Koig. R.
Depth Zone:				Surface	Surface	Surface	Surface	Surface	Surface
Replicate:				1	2	1	2	1	2
Date Sampled:				16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10
ALS Sample ID:	Units	CCME Guideline for the Protection of Freshwater Aquatic Life ^a	RDL ^h	L933177-17	L933177-18	L933177-19	L933177-20	L933177-21	L933177-22
Physical Tests									
Conductivity	µS/cm		2.0	59.6	59.8	47.4	49.5	52.0	51.6
Hardness (as CaCO ₃)	mg/L		0.50	18.0	18.0	11.4	11.4	12.6	12.6
pH	pH	6.5-9.0	0.10	7.34	7.31	7.15	7.29	7.31	7.26
Total Suspended Solids	mg/L	dependent on background levels	3.0	<3.0	<3.0	<3.0	<3.0	9.6	9.6
Total Dissolved Solids	mg/L		10	56	38	39	26	34	30
Turbidity	NTU	dependent on background levels	0.10	1.28	1.41	1.30	1.39	4.02	4.54
Anions and Nutrients									
Acidity (as CaCO ₃)	mg/L		1.0						
Alkalinity, Bicarbonate (as CaCO ₃)	mg/L		1.0-2.0	12.6	12.8	8.2	8.0	9.5	9.4
Alkalinity, Carbonate (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Hydroxide (as CaCO ₃)	mg/L		1.0-2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Alkalinity, Total (as CaCO ₃)	mg/L		1.0-2.0	12.6	12.8	8.2	8.0	9.5	9.4
Ammonia as N	mg/L	pH- and temperature-dependent	0.0050-0.010	<0.0050	0.0065	0.0068	<0.0050	<0.0050	<0.0050
Bromide (Br)	mg/L		0.050-0.25	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Chloride (Cl)	mg/L		0.50-2.50	8.15	8.18	8.04	7.95	7.72	7.76
Fluoride (F)	mg/L		0.020-0.10	0.022	0.024	0.020	0.021	0.021	<0.020
Nitrate (as N)	mg/L	2.9	0.0050-0.025	0.0176	0.0173	<0.0050	<0.0050	<0.0050	<0.0050
Nitrite (as N)	mg/L	0.06	0.0010-0.0050	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Kjeldahl Nitrogen	mg/L		0.050	0.355	0.371	0.300	0.261	0.319	0.318
Ortho Phosphate as P	mg/L		0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Total Phosphorus	mg/L		0.0020	0.0064	0.0059	0.0081	0.0087	0.0185	0.0173
Sulphate (SO ₄)	mg/L		0.50-2.5	2.73	2.77	1.24	1.23	1.48	1.48
Organic / Inorganic Carbon									
Total Organic Carbon	mg/L		0.20-0.50	5.24	5.35	4.12	4.07	4.21	4.24
Total Metals									
Aluminum (Al)	mg/L	0.005-0.1 ^b	0.0010-0.0030	0.0507	0.0506	0.0475	0.0450	0.162	0.166
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)	mg/L	0.005	0.000050-0.000250	0.000159	0.000136	0.000134	0.000163	0.000232	0.000222
Barium (Ba)	mg/L		0.000050-0.00010	0.00300	0.00292	0.00179	0.00178	0.00318	0.00342
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L		0.0010-0.0050	0.0122	0.0121	0.0151	0.0144	0.0147	0.0131
Cadmium (Cd)	mg/L	0.000017 ^{c,d}	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca)	mg/L		0.02-0.05	4.77	4.71	2.60	2.65	3.12	3.19
Chromium (Cr)	mg/L	Cr(VI): 0.001 Cr(III): 0.0089 ^d	0.00020-0.00060	0.00048	0.00047	0.00045	0.00040	0.00063	0.00064
Cobalt (Co)	mg/L		0.000050-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00014	0.00015
Copper (Cu)	mg/L	0.002-0.004 ^e	0.00010-0.0010	0.00143	0.00141	0.00098	0.00099	0.00165	0.00132
Iron (Fe)	mg/L	0.3	0.010-0.030	0.176	0.172	0.074	0.075	0.279	0.336
Lead (Pb)	mg/L	0.001-0.007 ^f	0.000050	<0.000050	<0.000050	<0.000050	<0.000050	0.000081	0.000093
Lithium (Li)	mg/L		0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)	mg/L		0.0050-0.10	1.82	1.76	1.36	1.38	1.44	1.45
Manganese (Mn)	mg/L		0.000050-0.00020	0.00354	0.00371	0.00700	0.00665	0.0209	0.0222
Mercury (Hg)	mg/L	Inorganic Mercury: 0.000026 Methylmercury: 0.000004 ^d	0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)	mg/L	0.073 ^d	0.000050	0.000053	<0.000050	0.000054	0.000068	0.000070	<0.000050
Nickel (Ni)	mg/L	0.025-0.150 ^g	0.00010-0.00020	0.00065	0.00064	0.00038	0.00033	0.00052	0.00057
Phosphorus (P)	mg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)	mg/L		0.050-2.0	0.649	0.641	0.682	0.686	0.704	0.727
Selenium (Se)	mg/L	0.001	0.00020-0.0010	0.00022	<0.00020	0.00023	<0.00020	<0.00020	0.00023
Silicon (Si)	mg/L		0.050	0.723	0.700	0.323	0.315	0.561	0.614
Silver (Ag)	mg/L	0.0001	0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)	mg/L		0.010-2.0	4.26	4.13	4.18	4.27	4.18	4.27
Strontium (Sr)	mg/L		0.000050-0.00010	0.0153	0.0149	0.0126	0.0128	0.0131	0.0133

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of freshwater aquatic life.

a) Canadian water quality guidelines for the protection of freshwater aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

b) 0.005 mg/L at pH <6.5; 0.1 mg/L at pH ≥ 6.5

c) Equation for correcting the guideline value for hardness = 10^[0.86(log(hardness)) - 3.2] / 1000

d) Interim guideline

e) 0.002 mg/L at [CaCO₃] = 0-120 mg/L; 0.003 mg/L at [CaCO₃] = 120-180 mg/L; =0.004 mg/L at [CaCO₃] = >180 mg/L

f) 0.001 mg/L at [CaCO₃] = 0-60 mg/L; 0.002 mg/L at [CaCO₃] = 60-120 mg/L; =0.004 mg/L at [CaCO₃] = 120-180 mg/L; 0.007 mg/L at [CaCO₃] = >180 mg/L

g) 0.025 mg/L at [CaCO₃] = 0-60 mg/L; 0.065 mg/L at [CaCO₃] = 60-120 mg/L; =0.110 mg/L at [CaCO₃] = 120-180 mg/L; 0.150 mg/L at [CaCO₃] = >180 mg/L

h) RDL = Realized detection limit

Appendix 3.3-1. Stream and River Water Quality Analytical Results, Hope Bay Belt Project, 2010

Site Abbreviation:				Aim. R.	Aim. R.	Aim. OF	Aim. OF	Koig. R.	Koig. R.
Depth Zone:				Surface	Surface	Surface	Surface	Surface	Surface
Replicate:				1	2	1	2	1	2
Date Sampled:				16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10	16-Sep-10
ALS Sample ID:				L933177-17	L933177-18	L933177-19	L933177-20	L933177-21	L933177-22
Total Metals (continued)									
Thallium (Tl)	mg/L	0.0008	0.0000020-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)	mg/L		0.00010-0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)	mg/L		0.00020-0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L		0.0000020-0.000010	0.000036	0.000038	0.000023	0.000023	0.000035	0.000041
Vanadium (V)	mg/L		0.000050-0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050
Zinc (Zn)	mg/L	0.03	0.0010-0.0040	0.0012	<0.0010	0.0016	<0.0010	0.0015	0.0020
Dissolved Metals									
Aluminum (Al)	mg/L		0.0010-0.0030	0.0101	0.0105	0.0087	0.0097	0.0102	0.0104
Antimony (Sb)	mg/L		0.000010-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Arsenic (As)	mg/L		0.000030-0.00010	0.000135	0.000142	0.000136	0.000123	0.000170	0.000172
Barium (Ba)	mg/L		0.000050-0.00010	0.00241	0.00240	0.00126	0.00124	0.00144	0.00147
Beryllium (Be)	mg/L		0.0000050-0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Bismuth (Bi)	mg/L		0.000050-0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Boron (B)	mg/L		0.0010-0.010	0.0073	0.0069	0.0086	0.0091	0.0077	0.0088
Cadmium (Cd)	mg/L		0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Calcium (Ca)	mg/L		0.02-0.05	4.43	4.48	2.45	2.42	2.84	2.86
Chromium (Cr)	mg/L		0.00010-0.00050	<0.00020	0.00023	<0.00020	<0.00020	<0.00020	<0.00020
Cobalt (Co)	mg/L		0.000050-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Copper (Cu)	mg/L		0.00010-0.00050	0.00117	0.00121	0.00077	0.00088	0.00089	0.00088
Iron (Fe)	mg/L		0.010-0.030	0.045	0.046	0.013	0.013	0.013	0.014
Lead (Pb)	mg/L		0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050	<0.000050
Lithium (Li)	mg/L		0.00020-0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Magnesium (Mg)	mg/L		0.0050-0.10	1.68	1.66	1.29	1.31	1.34	1.33
Manganese (Mn)	mg/L		0.000050-0.00020	0.000724	0.000872	0.000175	0.000179	0.000183	0.000177
Mercury (Hg)	mg/L		0.000010-0.000050	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo)	mg/L		0.000050	<0.000050	0.000058	<0.000050	<0.000050	0.000052	<0.000050
Nickel (Ni)	mg/L		0.00010-0.00020	0.00057	0.00058	0.00031	0.00035	0.00031	0.00033
Phosphorus (P)	mg/L		0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
Potassium (K)	mg/L		0.050-2.0	0.587	0.592	0.630	0.625	0.615	0.605
Selenium (Se)	mg/L		0.00010-0.0010	0.00021	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Silicon (Si)	mg/L		0.050	0.629	0.628	0.216	0.217	0.260	0.266
Silver (Ag)	mg/L		0.0000050-0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium (Na)	mg/L		0.010-2.0	3.93	3.92	3.97	4.03	4.12	3.97
Strontium (Sr)	mg/L		0.000050-0.00010	0.0140	0.0139	0.0116	0.0117	0.0119	0.0118
Thallium (Tl)	mg/L		0.0000020-0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Tin (Sn)	mg/L		0.00010-0.00020	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Titanium (Ti)	mg/L		0.00020-0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Uranium (U)	mg/L		0.0000020-0.000010	0.000024	0.000024	0.000016	0.000017	0.000015	0.000018
Vanadium (V)	mg/L		0.000050-0.0010	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Zinc (Zn)	mg/L		0.0010-0.0030	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Organic Parameters									
Microcystin	µg/L		0.20	-	-	-	-	-	-

Shaded cells indicate values that are both above analytical detection limits and exceed CCME guidelines for the protection of freshwater aquatic life.

a) Canadian water quality guidelines for the protection of freshwater aquatic life, Canadian Council of Ministers of the Environment, Updated December 2007

b) 0.005 mg/L at pH <6.5; 0.1 mg/L at pH ≥ 6.5

c) Equation for correcting the guideline value for hardness = 10^{0.86[log(hardness)] - 3.2} / 1000

d) Interim guideline

e) 0.002 mg/L at [CaCO₃] = 0-120 mg/L; 0.003 mg/L at [CaCO₃] = 120-180 mg/L; =0.004 mg/L at [CaCO₃] = >180 mg/L

f) 0.001 mg/L at [CaCO₃] = 0-60 mg/L; 0.002 mg/L at [CaCO₃] = 60-120 mg/L; =0.004 mg/L at [CaCO₃] = 120-180 mg/L; 0.007 mg/L at [CaCO₃] = >180 mg/L

g) 0.025 mg/L at [CaCO₃] = 0-60 mg/L; 0.065 mg/L at [CaCO₃] = 60-120 mg/L; =0.110 mg/L at [CaCO₃] = 120-180 mg/L; 0.150 mg/L at [CaCO₃] = >180 mg/L

h) RDL = Realized detection limit

Appendix 3.4-1

Lake Sediment Quality Descriptions, Hope Bay Belt
Project, 2010

Appendix 3.4-1. Lake Sediment Quality Descriptions, Hope Bay Belt Project, 2010

Watershed	Lake	Date	Depth Zone	Grab Depth (m)	Grab thickness (mm)	Physical Description	Munsell Colour Classification	Biological Material	Debris Material	Notes	Photos (# taken)
Aimaokatalok	Stickleback Lake	19-Aug-10	Shallow	2.5	45	Loose brown organic clay material	7.5 YR 4/2	Dense algal mat on surface with roots throughout	None	Difficult to obtain samples due to aquatic vegetation	Yes (5)
	Trout Lake	17-Aug-10	Shallow	2.5	35	Brown sandy layer (~5 mm) over grey clay	7.5 YR 3/4 - sand surface; 2.5 YR 4/1 clay bottom	None	- 1 % roots/ detritus	None	Yes (1)
	Aim. Lk. Stn. 13	13-Aug-10	Shallow	3.7	33	Sandy brown layer (5 mm) over grey clay	7.5 YR 3/4 - sand surface; 2.5 Y 6/1 clay bottom	None	pebbles throughout	None	Yes (1)
	Aim. Lk. Stn. 2	18-Aug-10	Shallow	3	45	Reddish brown sandy clay (~5 mm) over bluish grey clay	7.5 YR 4/4 sandy clay surface; 2.5 YR 5/1 clay bottom	None	None	None	Yes (2)
	Aim. Lk. Stn. 12	21-Aug-10	Shallow	0.3	15	Reddish brown loose sediment (~3 mm) over dense grey sandy layer	2.5 YR 4/6 surface; 2.5 YR 5/1 sandy bottom	~1% small macrophyte	None	None	Yes (3)
	Aim. Lk. Stn. 11	17-Aug-10	Shallow	2.5	33	Brownish red sand (~20 mm) overlying redish brown sand (~5 mm) midlayer over grey clay	7.5 YR 4/3 - sand surface; 7.5 YR 4/4 sand mid layer; 5 YR 5/1 clay bottom	None	None	None	Yes (6)
	Aim. Lk. Stn. 6	14-Aug-10	Deep	28	67	Brown silt layer (<5 mm) over grey clay	7.5 YR 4/3 - silt surface; 2.5 YR 5/1 clay bottom	None	None	None	Yes (1)
Windy	Windy	23-Aug-10	Shallow								No
		22-Aug-09	Deep	16.5	82	Silt (1 cm) over clay	2.5 Y5/4 - surface; GLE Y 1 6/10 GY - bottom	None	None	None	No
Doris	Wolverine	27-Aug-10	Shallow	2	55	silt, fine sand, homogenous, visible thick algal mat	7.5 YR 5/2	Algal mat on surface	woody fragments	None	No
	Patch	26-Aug-10	Shallow	3.5	50	Brown surface over homogenous clay layer	5 YR 5/2 - surface; 2.5 YR 5/1 - clay bottom	Thick plant layer on surface (~20mm)	None	None	Yes (3)
Reference B	Ref. Lk. B	23-Aug-10	Mid	5.5		Loose reddish brown silt (1 mm) over bluish grey clay		None	None	None	Yes (3)

Appendix 3.4-2

Lake Sediment Quality Photographs, Hope Bay Belt
Project, 2010