The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

ANNUAL REPORT

2010

Appendix A

Water Quality Sampling

LIST OF SAMPLING SITE LOCATIONS

Location	Source	Tests	Frequency
PRV-3	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
400,000 Gal Harvey Tank	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
General Store/Cafe	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Kelvin Grove	Harvey Creek	CL2 Residual and Turbidity	Daily Monday-Friday
PRV-5	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
100,000 Gal Magnesia Tank	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Brunswick Beach	Magnesia Creek	CL2 Residual and Turbidity	Daily Monday-Friday
Harvey Intake	Harvey Creek	Raw Water Turbidity	Daily Monday-Friday
Magnesia Intake	Magnesia Creek	Raw Water Turbidity	Daily Monday-Friday
PRV-3	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
400,000 Gal Harvey Tank	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Harvey UV Reactor	Harvey Creek	Total/Fecal Coliform, E Coli	Once a Month
General Store/Cafe	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Kelvin Grove	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
PRV-5	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
100,000 Gal Magnesia Tank	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
Magnesia UV Reactor	Magnesia Creek	Total/Fecal Coliform, E Coli	Once a Month
Brunswick Beach	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
Harvey Intake	Harvey Creek	Total/Fecal Coliform, E Coli	Every Monday
Magnesia Intake	Magnesia Creek	Total/Fecal Coliform, E Coli	Every Monday
PRV-3	At Tap	Metals, THM's, Organics	Three Times a Year
400,000 Gal Harvey Tank	At Tap	Metals, THM's, Organics	Three Times a Year
General Store/Cafe	At Tap	Metals, THM's, Organics	Three Times a Year
Kelvin Grove	At Tap	Metals, THM's, Organics	Three Times a Year
Community Centre	At Tap	Metals, THM's, Organics	Three Times a Year
PRV-5	At Tap	Metals, THM's, Organics	Three Times a Year
100,000 Gal Magnesia Tank	At Tap	Metals, THM's, Organics	Three Times a Year
Brunswick Beach	At Tap	Metals, THM's, Organics	Three Times a Year
Elementary School	At Tap	Metals, THM's, Organics	Three Times a Year
Harvey Intake	Harvey Creek	Metals, THM's, Organics	Three Times a Year
Magnesia Intake	Magnesia Creek	Metals, THM's, Organics	Three Times a Year

Bacteria

Sample collection for monitoring bacteria levels (Total Coliforms, Fecal Coliforms, and E. Coli) in the Lions Bay Water Distribution System is performed every Monday at nine sites. Samples are delivered to the Vancouver Coastal Health Authority for analysis and reporting. The sampling locations are listed above and include source, mid, and end systems sites.

In addition, random samples may be taken from areas where water quality complaints have originated or where waterworks construction or maintenance activities are underway.

Bacteriological standards in water distribution systems should meet the requirements of the B.C. Safe Drinking Water Regulations, which stipulates the following criteria for sample test results:

- Fecal Coliform: 0 fecal coliform / 100ml
- Total Coliform: 10 or less total coliform / 100 ml
- Total Coliform: 90% or more of the samples for a given month must have 0 total coliform / 100 ml.

Physical Parameters

Treated Water in the Distribution System is tested for Turbidity daily from Monday to Friday, at seven sites. Raw Water is tested for Turbidity at both intakes daily from Monday to Friday. Taste, Odour, and Turbidity are monitored on a complaint basis.

The Canadian Drinking Water Guidelines (and the US Environmental Protection Agency) state that the turbidity of an unfiltered raw water supply should generally be around 1 NTU, and should not exceed 5 NTU.

Chemical Parameters

- Free Chlorine Residual: Measured at all sampling sites when bacteriological samples are collected
- Haloacetic Acids (HAA's): HAA's are disinfection by-products. HAA's are not regulated in Canada but a maximum contaminant level of 60 ppb (based on a running annual average calculated with quarterly results for different locations within the system) has recently been adopted in the USA
- Trihalomethanes (THM's): THM's are disinfection by-products sampled with HAA's. The Guidelines for Canadian Drinking Water Quality (GCDWQ) list an interim maximum acceptable concentration for THM's at 100 ppb (based on a running annual average calculated with quarterly results for different locations within the system)
- pH: Measured on samples collected for HAA's / THM's testing. The GCDWQ recommend an aesthetic objective for pH ranging between 6.5 and 8.5
- Metals: During 2001, the regional Medical Health Officers developed a strategy for sampling metals at the tap. The new requirement is to sample 10% of the sampling metals "at the tap" in a quarterly basis for lead, copper and zinc, with sample locations consisting of a mixture of private homes and public buildings, including schools.

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix B

Source / Distribution Water Test Results

DATE	TREATED WATER JANUARY 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE/CAFÉ		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1														
2														
3														
4	0.68	0.54			0.56	0.33	0.43	0.20	0.54	0.52	0.35	0.88	0.46	0.83
5	4.66	0.56			0.58	0.42	0.55	0.21	0.46	0.50	0.73	0.77	0.46	0.60
6	0.50	0.67			0.30	0.46	0.30	0.20	0.52	0.59	0.53	0.98	0.59	0.55
7	0.50	0.74			0.48	0.61	0.38	0.36	0.40	0.73	0.36	1.03	0.36	0.54
8	0.40	0.87			0.44	0.44	0.31	0.46	0.27	0.84	0.28	0.28	0.49	0.49
9														
10														
11	1.26	0.42			0.63	0.42	0.49	0.25	0.61	0.51	0.68	0.91	1.28	0.81
12	5.88	0.14			3.12	0.08	0.43		3.00	0.13	3.85	1.07	0.63	0.64
13	3.61	0.26		0.28	1.55	0.14	1.95	0.20	1.81	0.13	2.12	0.90	0.77	0.60
14	1.04	0.63	0.76	0.67	1.02	0.37	0.91	0.20	0.81	0.54	1.11	0.73	0.39	0.52
15	0.92	0.56	0.89	0.71	0.61	0.42	0.54	0.24	0.60	0.59	1.10	0.74	1.27	0.62
16														
17														
18	1.1	0.51	0.74	0.49	0.62	0.54	0.70	0.88	0.48	0.62	0.74	0.69	0.74	0.24
19	0.8	0.59	0.82	0.63	0.70	0.35	0.41	0.37	0.43	0.47	1.14	0.65	0.57	0.33
20	0.46	0.71	0.74	0.76	0.41	0.51	0.37	0.23	0.59	0.67	0.66	0.66	0.43	0.35
21	0.44	0.73	0.46	0.77	0.53	0.61	0.29	0.36	0.28	0.70	0.41	0.70	0.53	0.28
22	0.39	0.81	0.36	0.85	0.36	0.66	0.30	0.34	0.29	0.77	0.46	0.73	0.62	0.25
23														
24														
25	0.4	0.90	0.35	0.88	0.38	0.83	0.36	0.62	0.30	0.91	0.42	0.75	0.40	0.37
26	0.41	0.67	0.36	0.73	0.42	0.59	0.38	0.67	0.30	0.69	0.36	0.76	0.75	0.44
27	0.39	0.76	0.23	0.78	0.37	0.55	0.26	0.38	0.37	0.67	0.35	0.76	0.34	0.46
28	0.33	0.75	0.27	0.78	0.47	0.61	0.31	0.38	0.31	0.73	0.26	0.81	0.38	0.48
29	0.33	0.79	0.30	0.87	0.33	0.63	0.26	0.49	0.27	0.73	0.32	0.85	0.31	0.64
30														
31														

DATE	TREATED WATER FEBRUARY 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.41	0.74	0.26	0.79	0.42	0.55	0.54	0.45	0.34	0.72	0.31	0.76	0.37	0.49
2	0.27	0.77	0.26	0.80	0.41	0.65	0.26	0.55	0.28	0.76	0.35	0.80	0.40	0.51
3	0.31	0.75	0.36	0.80	0.36	0.61	0.31	0.56	0.23	0.74	0.29	0.90	0.32	0.51
4	0.22	0.77	0.23	0.79	0.34	0.60	0.40	0.51	0.30	0.78	0.32	0.83	0.28	0.50
5	0.49	0.72	0.42	0.74	0.40	0.62	0.30	0.60	0.31	0.71	0.26	0.84	0.33	0.56
6														
7														
8	0.39	0.77	0.61	0.81	0.39	0.59	0.30	0.35	0.28	0.70	0.25	0.84	0.43	0.57
9	0.35	0.77	0.22	0.84	0.31	0.60	0.76	0.53	0.26	0.74	0.34	0.86	0.34	0.58
10	0.37	0.85	0.25	0.91	0.48	0.64	0.34	0.65	0.22	0.89	0.37	0.76	0.35	0.57
11	0.58	0.58	0.63	0.61	0.41	0.48	0.38	0.58	0.55	0.55	0.87	0.80	0.40	0.55
12	0.37	0.79	0.25	0.83	0.35	0.68	0.29	0.73	0.25	0.87	0.37	0.77	0.34	0.60
13														
14														
15	0.64	0.61	0.66	0.63	0.31	0.32	0.53	0.42	0.64	0.55	0.79	0.79	0.57	0.37
16	0.72	0.68	0.70	0.70	0.57	0.34	0.38	0.51	0.52	0.66	0.43	0.85	0.42	0.31
17	0.50	0.64	0.32	0.69	0.37	0.40	0.41	0.42	0.34	0.60	0.36	0.81	0.39	0.46
18	0.48	0.83	0.34	0.90	0.40	0.53	0.35	0.30	0.37	0.73	0.40	0.84	0.36	0.47
19	0.41	0.89	0.28	0.95	0.48	0.64	0.36	0.56	0.26	0.93	0.38	0.86	0.39	0.42
20														
21														
22	0.54	1.01	0.31	0.96	0.48	0.88	0.45	0.77	0.34	0.98	0.41	0.60	0.32	0.50
23	0.49	0.85	0.35	0.86	0.37	0.77	0.35	0.83	0.28	0.86	0.26	0.61	0.31	0.37
24	0.27	0.75	0.28	0.77	0.41	0.65	0.38	0.70	0.37	0.75	0.37	0.91	0.29	0.31
25	0.41	0.75	0.74	0.71	0.54	0.58	0.41	0.58	0.64	0.69	0.25	0.94	0.37	0.32
26	0.40	0.37	0.28	0.39	0.49	0.39	0.36	0.53	0.30	0.93	0.24	0.97	0.36	0.40
27														
28														

DATE	TREATED WATER MARCH 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.43	0.49	0.33	0.51	0.42	0.14	0.38	0.12	0.40	0.89	0.35	0.89	0.39	0.73
2	0.35	0.52	0.29	0.57	0.33	0.30	0.36	0.14	0.55	0.85	0.30	0.91	0.42	0.71
3	0.47	0.52	0.46	0.56	0.38	0.47	0.45	0.23	0.44	0.81	0.25	0.83	0.35	0.58
4	0.49	0.65	0.38	0.70	0.35	0.48	4.18	0.39	1.99	0.89	0.30	0.77	0.40	0.61
5	0.42	0.71	0.27	0.75	0.37	0.52	0.30	0.67	0.32	0.75	0.29	0.72	0.31	0.68
6														
7														
8	0.38	0.65	0.39	0.71	0.40	0.58	0.32	0.61	0.29	0.75	0.25	0.76	0.37	0.49
9	0.41	0.71	0.20	0.76	0.33	0.60	0.35	0.47	0.25	0.78	0.30	0.79	0.34	0.53
10	0.25	0.73	0.26	0.77	0.42	0.60	0.23	0.48	0.22	0.79	0.22	0.79	0.33	0.50
11	0.36	0.75	0.31	0.71	0.39	0.58	0.61	0.59	0.31	0.79	0.27	0.78	0.34	0.55
12	0.32	0.72	0.26	0.74	0.38	0.58	0.33	0.57	0.26	0.76	0.23	0.78	0.26	0.58
13														
14														
15	0.36	0.65	0.35	0.68	0.41	0.57	0.31	0.46	0.31	0.73	0.37	0.79	0.35	0.59
16	0.42	0.66	0.38	0.79	0.37	0.47	0.23	0.51	0.37	0.84	0.23	0.85	0.31	0.59
17	0.39	0.67	0.54	0.70	0.33	0.52	0.41	0.21	0.32	0.88	0.35	0.84	0.27	0.59
18	0.31	0.83	0.45	0.86	0.47	0.65	0.29	0.20	0.28	0.84	0.48	0.84	0.27	0.57
19	0.56	0.68	0.51	0.55	0.82	0.58	0.39	0.39	0.28	0.79	0.31	0.81	0.28	0.62
20														
21														
22	0.34	0.58	0.48	0.54	0.35	0.39	0.59	0.20	0.37	0.80	0.27	0.81	0.38	0.60
23	0.33	0.59	0.35	0.42	0.26	0.45	0.28	0.36	0.27	0.80	0.75	0.84	0.42	0.62
24	0.28	0.58	0.34	0.56	0.51	0.49	0.32	0.20	0.26	0.81	0.26	0.84	0.29	0.67
25	0.41	0.61	0.27	0.61	0.29	0.54	1.08	0.49	0.33	0.80	0.37	0.81	0.33	0.66
26	0.28	0.52	0.41	0.46	0.31	0.41	0.98	0.32	0.37	0.81	0.28	0.89	0.26	0.65
27														
28														
29	0.66	0.40	0.51	0.50	0.41	0.34	0.63	0.30	0.38	0.70	0.39	0.77	0.36	0.64
30	0.46	0.41	0.39	0.52	0.39	0.24	0.39	0.26	0.40	0.70	0.32	0.73	0.37	0.63
31	0.49	0.34	0.34	0.56	0.31	0.32	0.36	0.33	0.27	0.73	0.32	0.78	0.31	0.60

DATE	TREATED WATER APRIL 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.34	0.56	0.30	0.59	0.36	0.42	0.35	0.42	0.49	0.74	0.35	0.79	3.59	0.54
2														
3														
4														
5														
6	0.44	0.52	0.55	0.56	0.28	0.42	0.47	0.40	0.32	0.62	0.34	0.61	0.37	0.25
7	0.32	0.52	0.32	0.56	0.35	0.40	0.31	0.21	0.43	0.61	0.50	0.62	0.36	0.29
8	0.44	0.46	0.33	0.50	0.37	0.38	0.49	0.40	0.69	0.60	0.33	0.64	0.34	0.33
9	0.56	0.45	0.35	0.50	0.41	0.33	0.36	0.32	0.77	0.60	0.71	0.61	0.41	0.31
10														
11														
12	0.34	0.59	0.41	0.64	0.38	0.56	0.40	0.43	1.75	0.67	0.47	0.64	0.43	0.37
13	0.39	0.56	0.49	0.62	0.41	0.54	0.45	0.20	0.37	0.65	0.37	0.64	0.42	0.43
14	0.35	0.52	0.56	0.57	0.41	0.49	0.33	0.21	0.38	0.67	0.33	0.64	0.35	0.40
15	0.41	0.54	0.65	0.59	0.32	0.48	0.35	0.20	0.36	0.65	0.35	0.63	0.34	0.43
16	0.40	0.52	0.38	0.57	0.33	0.38	0.34	0.21	0.37	0.62	0.36	0.61	0.41	0.43
17														
18														
19	0.70	0.51	0.40	0.56	0.49	0.30	0.51	0.24	0.74	0.45	0.64	0.45	0.32	0.38
20	0.55	0.48	0.54	0.54	0.47	0.35	0.37	0.30	1.03	0.43	0.85	0.50	0.42	0.25
21	0.46	0.50	0.41	0.55	0.52	0.32	0.30	0.22	0.68	0.54	0.56	0.60	0.65	0.20
22	0.62	0.54	0.37	0.59	0.38	0.34	0.38	0.37	0.60	0.58	0.51	0.60	0.61	0.21
23	0.42	0.51	0.48	0.56	0.36	0.38	0.39	0.34	0.35	0.61	0.46	0.64	0.52	0.21
24														
25														
26	0.34	0.54	0.33	0.59	0.35	0.45	0.31	0.40	0.48	0.68	0.29	0.71	0.31	0.38
27	0.47	0.45	0.68	0.50	0.16	0.40	0.15	0.37	0.89	0.51	1.04	0.52	0.19	0.41
28	1.62	0.39	0.97	0.44	0.46	0.20	0.37	0.24	1.90	0.42	1.47	0.44	0.18	0.43
29	0.39	0.60	0.27	0.66	0.33	0.39	0.25	0.47	0.95	0.71	0.82	0.87	1.05	0.20
30	0.33	0.66	0.15	0.71	0.19	0.40	0.24	0.44	0.65	0.74	0.51	0.75	1.02	0.20

DATE	TREATED WATER MAY 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1														
2														
3	0.58	0.67	0.18	0.72	0.30	0.48	0.11	0.36	1.28	1.06	0.43	1.12	1.26	0.26
4	0.22	0.67	0.25	0.71	0.17	0.45	0.14	0.31	0.58	0.93	0.30	0.98	0.48	0.38
5	0.20	0.74	0.15	0.78	0.17	0.46	0.16	0.45	0.41	0.91	0.23	0.93	0.24	0.56
6	0.20	0.78	0.15	0.83	0.16	0.52	0.33	0.26	0.48	0.93	0.40	0.94	0.29	0.57
7	0.18	0.80	0.10	0.84	0.14	0.58	0.21	0.25	0.25	0.98	0.18	0.91	1.04	0.41
8														
9														
10	0.15	0.74	0.11	0.78	0.12	0.61	0.16	0.32	0.34	1.10	1.20	1.16	0.15	0.63
11	0.20	0.71	0.11	0.75	0.25	0.56	0.12	0.33	0.21	1.00	0.14	1.04	0.17	0.77
12	0.45	0.66	0.18	0.70	0.22	0.46	0.33	0.40	0.50	1.10	0.33	1.02	0.21	0.80
13	0.16	0.70	0.17	0.74	0.17	0.53	0.24	0.33	0.24	0.89	0.24	0.95	0.19	0.65
14	0.18	0.64	0.13	0.69	0.26	0.50	0.16	0.25	0.28	0.85	0.19	0.92	1.16	0.29
15														
16														
17	0.23	0.57	0.24	0.62	0.25	0.40	0.19	0.25	0.27	0.93	0.19	0.91	0.18	0.43
18														
19	0.29	0.59	0.32	0.64	0.31	0.29	0.16	0.53	0.29	0.86	0.23	0.90	0.14	0.53
20	0.48	0.50	0.41	0.51	0.23	0.22	0.22	0.21	0.32	0.83	0.36	0.88	0.12	0.46
21	0.37	0.57	0.22	0.59	0.19	0.26	0.33	0.43	0.36	0.85	0.28	0.77	0.15	0.41
22														
23														
24														
25	1.01	0.63	0.22	0.71	2.13	0.52	0.36	0.55	0.18	1.04	0.15	0.99	0.17	0.69
26	0.18	0.58	0.75	0.63	0.42	0.37	0.16	0.20	0.18	0.77	0.56	0.93	0.23	0.67
27	0.43	0.52	0.34	0.57	0.20	0.36	0.22	0.20	0.39	0.79	0.43	0.64	0.16	0.64
28	0.19	1.94	0.73	2.05	0.37	1.08	0.18	0.90	0.22	0.74	0.18	0.71	0.38	0.45
29														
30														
31									0.19	0.67	0.18	0.59	0.17	0.26

DATE	TREATED WATER JUNE 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.36	0.68	0.37	0.73	0.26	0.48	0.21	0.55	0.28	0.63	0.46	0.62	0.12	0.22
2	0.57	0.50	0.62	0.54	0.23	0.40	0.20	0.37	0.63	0.60	0.35	0.57	0.19	0.27
3	1.48	1.59	1.61	1.63	0.83	1.01	0.69	0.44	1.03	0.49	0.86	0.41	0.23	0.22
4	0.78	0.96	1.24	1.02	0.76	0.77	0.52	0.67	0.69	1.15	0.50	1.08	0.63	
5														
6														
7	0.17	0.45	0.15	0.42	0.15	0.34	0.21	0.21	0.32	0.56	0.21	0.61	0.34	0.21
8	0.22	0.38	0.73	0.38	0.14	0.25	0.16	0.22	0.41	0.56	0.52	0.70	0.19	0.26
9	0.23	0.47	0.55	0.47	0.13	0.27	0.20	0.33	0.30	0.54	0.54	0.62	0.14	0.22
10	0.19	0.46	0.36	0.49	0.15	0.21	0.16	0.24	0.23	0.64	0.30	0.74	0.17	0.23
11		0.57		0.63		0.36		0.18		0.63		0.72		0.26
12														
13														
14	0.21	0.51	0.32	0.55	0.14	0.30	0.15	0.19	0.24	0.66	0.28	0.66	0.17	0.34
15	0.37	0.53	1.05	0.61	0.45	0.34	0.25	0.20	0.54	0.66	0.22	0.71	0.19	0.34
16	0.36	0.50	0.41	0.55	0.20	0.36	0.16	0.20	0.19	0.75	0.19	0.76	0.17	0.32
17	0.24	0.65	0.51	0.70	0.20	0.38	0.12	0.35	0.43	0.82	0.36	0.80	0.15	0.36
18	0.35	0.64	0.44	0.69	0.16	0.46	0.19	0.25	0.43	0.77	0.35	0.79	0.19	0.43
19														
20														
21	0.21	0.65	0.43	0.70	0.34	0.45	0.18	0.20	0.30	0.74	0.16	0.73	0.17	0.41
22	0.20	0.76	0.86	0.81	0.16	0.57	0.13	0.27	0.21	0.76	0.19	0.79	0.15	0.33
23	0.27	0.71	0.60	0.75	0.18	0.57	0.14	0.20	0.27	0.78	0.34	0.79	0.12	0.36
24	0.46	0.76	0.42	0.81	0.29	0.49	0.14	0.37	0.46	0.79	0.31	0.78	0.15	0.35
25	0.21	0.72	0.98	0.75	0.17	0.51	0.19	0.20	0.28	0.75	0.14	0.80	0.15	0.41
26														
27														
28	0.33	0.73	0.61	0.77	0.21	0.53	0.16	0.25	0.20	0.82	0.33	0.78	0.13	0.35
29	0.19	0.72	0.16	0.76	0.29	0.57	0.11	0.50	0.19	0.74	0.18	0.78	0.12	0.29
30	0.22	0.80	0.30	0.84	0.16	0.54	0.11	0.20	0.18	0.86	0.27	0.82	0.13	0.38

DATE	TREATED WATER JULY 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1														
2														
3														
4														
5	0.18	0.77	0.33	0.81	0.18	0.64	0.14	0.43	0.37	0.85	0.12	0.91	0.13	0.51
6	0.24	0.70	0.28	0.75	0.15	0.55	0.14	0.34	0.19	0.88	0.49	0.95	0.18	0.53
7	0.30	0.63	1.41	0.67	0.24	0.54	0.18	0.20	0.56	0.88	0.34	0.94	0.17	0.71
8	0.35	0.71	0.87	0.75	0.37	0.52	0.16	0.23	0.42	0.77	0.85	0.78	0.13	0.65
9	0.60	0.81	1.38	0.84	0.44	0.59	0.23	0.20	0.56	0.73	2.02	0.78	0.45	0.52
10														
11														
12	0.22	0.59	3.69	0.63	0.40	0.48	0.43	0.21	3.43	0.72	0.39	0.91	0.27	0.59
13	0.22	0.89	0.38	0.92	0.58	0.64	0.19	0.45	0.51	0.77	0.19	0.82	0.21	0.51
14	0.22	0.95	1.04	0.98	0.91	0.77	0.15	0.36	0.24	0.86	0.21	0.89	0.16	0.40
15	0.22	0.78	0.34	0.81	0.24	0.67	0.18	0.27	0.25	0.83	0.30	0.86	0.15	0.60
16	0.29	0.83			0.21	0.60							0.13	0.61
17														
18														
19	0.22	0.79	0.22	0.83	0.20	0.60	0.20	0.20	0.21	0.81	0.25	0.83	0.13	0.53
20	0.22	0.83	0.47	0.86	0.15	0.67	0.13	0.38	0.28	0.88	0.35	0.86	0.18	0.61
21	0.27	0.89	0.48	0.92	0.21	0.67	0.16	0.54	0.16	0.80	0.24	0.81	0.13	0.65
22	0.24	0.80	0.33	0.83	0.23	0.69	0.22	0.29	0.24	0.72	0.21	0.75	0.25	0.57
23	0.43	0.82	0.72	0.84	0.18	0.73	0.13	0.41	0.45	0.73	0.31	0.75	0.19	0.49
24														
25														
26	0.22	0.86	0.12	0.89	0.18	0.69	0.17	0.22	0.17	0.72	0.15	0.75	0.16	0.54
27	0.23	0.80	0.43	0.84	0.19	0.72	0.15	0.38	1.10	0.67	0.17	0.73	0.17	0.50
28	0.28	0.78	0.14	0.81	0.18	0.66	0.13	0.66	0.27	0.77	0.26	0.81	0.15	0.50
29	0.22	0.78	0.23	0.81	0.18	0.63	0.35	0.37	0.45	0.79	0.26	0.83	0.16	0.56
30	0.28	0.78	0.46	0.82	0.19	0.62	0.21	0.40	0.59	0.80	0.50	0.86	0.85	0.62
31														

DATE	TREATED WATER AUGUST 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1														
2														
3	0.17	0.73	0.21	0.75	0.16	0.66	0.25	0.54	0.23	0.82	0.16	0.83	0.22	0.63
4	0.19	0.76	0.61	0.78	0.24	0.64	0.13	0.42	0.21	0.86	0.22	0.84	0.16	0.61
5	0.42	0.74	1.20	0.58	0.38	0.27	0.19	0.78	0.63	0.80	0.49	0.82	0.16	0.57
6	0.28	0.73	0.76	0.75	0.28	0.64	0.70	0.43	0.20	0.68	0.16	0.74	0.20	0.58
7														
8														
9	0.12	0.65	0.17	0.68	0.27	0.50	0.12	0.51	0.14	0.65	0.18	0.67	0.18	0.42
10	0.25	0.61	0.23	0.64	0.17	0.51	0.17	0.29	0.31	0.68	0.38	0.77	0.12	0.42
11	0.21	0.64	2.60	0.67	0.37	0.48	0.24	0.22	0.35	0.76	0.15	0.74	0.15	0.42
12	0.30	0.65	0.34	0.68	0.17	0.46	0.14	0.37	0.36	0.70	0.18	0.81	0.13	0.56
13	0.48	0.68	0.75	0.70	0.17	0.55	0.13	0.42	0.49	0.84	0.36	0.86	0.13	0.59
14														
15														
16	0.16	0.62	0.12	0.65	0.16	0.51	0.21	0.27	0.16	0.84	0.16	0.88	0.15	0.66
17	0.18	0.67	0.25	0.71	0.13	0.53	0.15	0.30	0.15	0.76	0.09	0.81	0.14	0.63
18	0.14	0.68	0.16	0.70	0.15	0.54	0.10	0.30	0.39	0.74	0.15	0.74	0.15	0.58
19	0.16	0.71	0.18	0.72	0.18	0.54	0.12	0.30	0.14	0.73	0.17	0.75	0.12	0.55
20	0.14	0.70	0.13	0.73	0.15	0.54	0.13	0.22	0.15	0.71	0.12	0.75	0.21	0.48
21														
22														
23	0.21	0.77	0.12	0.80	0.12	0.58	0.09	0.63	0.13	0.75	0.14	0.80	0.20	0.59
24	0.19	0.77	0.13	0.80	0.30	0.61	0.13	0.38	0.23	0.80	0.21	0.82	0.12	0.58
25	0.21	0.75	0.67	0.79	0.16	0.59	0.33	0.21	0.15	0.88	0.19	0.73	0.20	0.63
26	0.30	0.74	0.48	0.76	0.24	0.62	0.19	0.21	0.23	0.84	0.19	0.87	0.15	0.68
27	0.21	0.78	0.20	0.81	0.12	0.54	0.20	0.22	0.13	0.89	0.14	0.89	0.15	0.63
28														
29														
30	0.23	0.68	0.14	0.70	0.11	0.56	0.12	0.25	0.09	0.82	0.10	0.90	0.14	0.74
31	0.13	0.66	0.11	0.69	0.17	0.60	0.11	0.27	0.11	0.80	0.11	0.82	0.10	0.68

DATE	TREATED WATER SEPTEMBER 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.35	0.35	0.97	0.41	0.30	0.20	0.11	0.27	0.28	0.69	0.71	0.70	0.15	0.56
2	0.27	0.64	0.39	0.67	0.35	0.27	0.21	0.22	0.18	0.75	0.11	0.74	0.13	0.46
3	0.19	0.75	0.62	0.78	0.24	0.50	0.11	0.45	0.15	0.74	0.11	0.76	0.16	0.52
4														
5														
6														
7	0.30	0.82	0.15	0.85	0.21	0.66	0.12	0.47	0.18	0.70	0.15	0.74	0.12	0.50
8	0.15	0.78	0.10	0.81	0.17	0.63	0.11	0.37	0.18	0.83	0.28	0.84	0.21	0.54
9	0.25	0.80	0.11	0.82	0.25	0.60	0.15	0.56	0.17	0.84	0.10	0.87	0.10	0.60
10	0.14	0.81	0.11	0.84	0.19	0.66	0.13	0.67	0.15	0.88	0.10	0.90	0.11	0.66
11														
12														
13	0.25	0.52	0.26	0.56	0.32	0.21	0.22	0.31	0.24	0.63	0.35	0.61	0.16	0.54
14	0.35	0.69	0.53	0.72	0.28	0.34	0.42	0.23	0.28	0.65	0.35	0.65	0.16	0.39
15	0.50	0.89	0.50	0.91	0.16	0.50	0.20	0.22	0.34	0.70	0.28	0.70	0.17	0.33
16	0.23	0.91	0.42	0.93	0.30	0.70	0.20	0.70	0.31	0.68	0.14	0.73	0.14	0.46
17	0.46	0.86	1.52	0.88	0.21	0.69	0.12	0.64	0.24	0.71	0.19	0.70	0.15	0.53
18														
19														
20	0.20	0.45	0.21	0.47	0.27	0.33	0.14	0.26	0.52	0.58	0.62	0.58	0.15	0.41
21	1.06	0.47	0.40	0.50	0.19	0.18	0.18	0.20	0.30	0.61	0.38	0.64	0.13	0.33
22	0.29	0.70	1.21	0.75	0.26	0.32	0.43	0.40	0.25	0.80	0.17	0.82	0.19	0.28
23	0.28	0.84	0.29	0.87	0.34	0.45	1.18	0.66	0.24	0.81	0.15	0.87	0.13	0.40
24	0.42	0.65	1.71	0.68	0.19	0.52	0.40	0.78	0.26	0.78	0.24	0.78	0.11	0.63
25														
26														
27	0.76	0.34	0.63	0.38	0.42	0.20	0.44	0.24	0.49	0.43	0.48	0.41	0.31	0.22
28	0.51	0.63	0.60	0.65	0.30	0.23	0.33	0.21	0.53	0.69	0.43	0.72	0.62	0.20
29	0.72	0.70	0.41	0.74	0.24	0.28	0.17	0.37	0.33	0.74	0.34	0.74	0.28	0.22
30	0.39	0.89	0.25	0.92	0.31	0.44	0.13	0.43	0.28	0.83	0.25	0.85	0.20	0.30

DATE	TREATED WATER OCTOBER 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.12	1.08	0.20	0.86	0.16	0.59	0.15	0.31	0.18	0.88	0.24	1.01	0.18	0.48
2														
3														
4	0.15	1.02	0.22	0.97	0.19	0.79	0.16	0.42	0.18	0.91	0.24	0.94	0.19	0.53
5	0.17	1.01	0.11	1.04	0.09	0.83	0.11	0.49	0.12	0.94	0.10	0.98	0.09	0.64
6	0.23	1.02	0.11	1.05	0.14	0.79	0.14	0.66	0.25	0.93	0.19	0.95	0.12	0.73
7	0.20	0.93	0.19	0.96	0.25	0.73	0.12	0.64	0.15	0.89	0.13	0.97	0.18	0.72
8	0.16	0.93	0.21	0.95	0.14	0.68	0.10	0.46	0.11	0.87	0.11	0.91	0.15	0.71
9														
10														
11														
12	0.26	0.79	0.39	0.81	0.40	0.58	0.18	0.47	0.28	0.93	0.23	0.94	0.15	0.61
13	0.20	0.71	0.42	0.73	0.20	0.38	0.17	0.21	0.31	0.87	0.27	0.93	0.14	0.69
14	0.68	0.69	0.37	0.70	0.23	0.40	0.20	0.42	0.18	0.94	0.25	0.96	0.31	0.72
15	0.36	0.79	0.31	0.77	0.22	0.40	0.19	0.24	0.18	0.89	0.23	0.92	0.27	0.73
16														
17														
18	0.31	0.79	0.27	0.68	0.18	0.51	0.17	0.29	0.17	0.98	0.21	1.06	0.23	0.79
19	0.13	0.91	0.38	0.94	0.15	0.66	0.11	0.45	0.11	0.98	0.08	0.99	0.14	0.90
20	0.19	0.81	0.46	0.84	0.14	0.58	0.23	0.57	0.16	0.93	0.12	0.95	0.19	0.90
21	0.30	0.75	0.67	0.78	0.13	0.52	0.16	0.33	0.18	0.90	0.11	0.89	0.20	0.82
22	0.29	0.69	0.68	0.71	0.15	0.49	0.13	0.29	0.29	0.83	0.26	0.86	0.19	0.79
23														
24														
25	0.77	0.71	0.67	0.64	0.45	0.28	0.28	0.56	19.60	0.26	20.70	0.41	18.70	0.00
26	10.10	0.57	1.18	0.62	0.55	0.22	0.41	0.21	21.80	0.30	21.10	0.41	24.00	0.00
27	0.52	0.87	0.62	0.72	0.27	0.29	0.24	0.58	6.40	0.94	4.56	1.05	14.90	0.52
28	0.92	0.96	0.79	0.91	0.24	0.53	0.41	0.70	1.60	0.88	1.41	0.99	2.35	0.56
29	0.48	0.91	0.68	0.87	0.26	0.67	0.32	0.50	1.00	0.91	0.73	0.99	0.80	0.58
30														
31														

DATE	TREATED WATER NOVEMBER 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	0.63	0.80	1.15	0.66	0.25	0.43	0.16	0.34	1.54	0.79	1.49	0.89	1.08	0.50
2	3.66	0.72	1.75	0.74	0.52	0.26	0.35	0.27	2.45	0.78	2.04	0.98	2.06	0.42
3	1.44	0.81	0.77	0.75	0.28	0.38	0.25	0.52	0.99	0.97	0.77	1.02	0.64	0.69
4	0.49	0.75	0.77	0.79	0.21	0.48	0.19	0.56	0.50	1.01	0.32	1.07	0.34	0.82
5	0.46	0.85	0.36	0.87	0.26	0.56	0.18	0.52	0.65	0.87	0.54	0.90	0.41	0.79
6														
7														
8	0.74	0.80	0.68	0.83	0.35	0.34	0.34	0.48	0.86	0.85	0.84	0.91	0.73	0.49
9	0.39	0.91	0.70	0.94	0.28	0.56	0.23	0.59	0.65	1.15	0.67	1.20	0.35	0.83
10	0.82	0.80	0.75	0.82	0.23	0.49	0.21	0.59	0.53	1.12	0.62	1.11	0.33	0.89
11	0.14	0.79	0.95	0.84	0.11	0.41	0.20	0.47	0.39	1.12	1.05	1.15	0.52	0.81
12														
13														
14														
15	0.16	0.73	0.23	0.77	0.58	0.43	0.12	0.54	0.39	1.10	0.28	1.12	0.24	1.00
16	0.34	0.72	0.73	0.75	0.21	0.41	0.17	0.27	0.86	0.85	0.57	0.85	0.43	0.83
17	0.79	0.91	1.01	0.92	0.34	0.47	0.14	0.60	0.40	0.78	0.48	0.90	0.30	0.63
18	1.04	0.90	0.59	0.92	0.24	0.45	0.21	0.48	0.40	0.77	0.42	0.89	0.34	0.67
19														
20														
21														
22	0.21	1.24	0.16	1.26	0.15	1.04	0.13	1.26	0.25	1.08	0.22	1.11	0.18	0.96
23	0.19	0.94	0.31	0.96	0.25	0.85	0.23	0.86	1.68	1.17	1.59	1.19	0.42	0.99
24	0.31	0.89	0.19	0.91	0.21	0.74	0.24	0.83	0.55	1.09	0.44	1.09	0.54	0.99
25	0.22	0.84	0.14	0.86	0.39	0.64	0.33	0.55	0.45	1.00	0.69	1.03	0.30	0.92
26	0.36	0.79	0.69	0.82	0.29	0.57	0.16	0.63	0.63	0.85	0.53	0.84	0.31	0.78
27														
28														
29	0.31	0.70	0.34	0.72	0.17	0.42	0.13	0.21	0.30	0.70	0.30	0.75	0.35	0.49
30	0.55	0.72	0.44	0.74	0.30	0.54	0.15	0.30	1.21	0.55	1.19	0.59	0.42	0.47

DATE	TREATED WATER DECEMBER 2010													
	HARVEY								MAGNESIA					
	PRV-3		400 HAR. TANK		STORE / CAFE		KELVIN GROVE		PRV-5		100 MAG. TANK		BRUNSWICK B.	
	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)	Turbidity (NTU)	CL Res. (ppm)
1	1.09	0.63	0.67	0.65	0.28	0.29	0.35	0.23	0.96	0.78	0.55	0.87	0.71	0.30
2	0.73	0.76	0.54	0.79	0.27	0.39	0.17	0.59	0.59	0.90	0.39	0.98	0.50	0.44
3	0.67	0.82	0.72	0.61	0.24	0.52	0.21	0.21	0.45	0.96	0.30	1.00	0.33	0.50
4														
5														
6	0.31	1.13	0.18	1.12	0.29	0.88	0.16	0.26	0.25	0.98	0.22	1.03	0.19	0.69
7	0.33	0.93	0.18	0.95	0.25	0.89	0.16	0.59	0.36	0.98	2.03	0.97	0.22	0.76
8	4.28	0.47	1.49	0.48	1.12	0.24	0.29	0.36	22.10	0.18	16.20	0.41	0.33	0.68
9	1.44	0.87	0.58	0.89	0.92	0.42	0.72	0.21	5.38	0.75	4.56	0.93	3.83	0.20
10	1.06	1.11	0.83	1.15	0.53	0.62	0.44	0.22	2.42	1.13	1.95	1.24	4.58	0.38
11														
12														
13	3.99	0.94	0.86	0.96	0.52	0.66	0.26	0.21	1.06	1.04	0.93	1.05	0.63	0.76
14														
15	0.66	0.95	0.39	0.97	0.25	0.69	0.22	0.26	0.68	0.88	0.68	0.96	0.56	0.63
16	1.01	1.08	0.66	1.10	0.30	0.67	0.43	0.39	0.56	0.92	0.49	1.00	0.44	0.46
17	0.54	0.90	0.60	0.94	0.23	0.78	0.22	0.34	0.60	0.98	0.35	1.02	0.65	0.54
18														
19														
20	0.26	1.01	0.18	1.04	0.17	0.75	0.20	0.69	0.67	0.97	0.33	1.02	0.36	0.64
21	1.03	0.92	0.68	0.94	0.45	0.73	0.14	0.70	1.07	1.06	0.30	1.07	0.22	0.74
22	0.45	0.61	0.60	0.64	0.25	0.59	0.20	0.46	20.50	0.69	2.94	0.79	0.36	0.74
23	0.28	0.80	0.46	0.53	0.19	0.37	0.33	0.38	0.68	0.65	5.45	0.91	0.24	0.76
24	0.85	0.56	0.81	0.55	0.20	0.34	0.41	0.41	0.63	0.47	8.31	0.89	0.50	0.43
25														
26														
27	0.56	1.37	0.40	1.19	0.37	0.86	0.29	1.24	0.61	1.17	3.70	0.97	4.26	0.27
28	0.17	0.79	0.52	0.75	0.25	0.77	0.63	0.96	0.49	0.77	2.17	1.20	3.41	0.28
29	0.26	0.80	0.16	0.76	0.12	0.48	0.14	0.57	0.22	0.69	1.48	1.13	2.26	0.42
30														
31	0.11	0.85	0.10	0.66	0.17	0.61	0.10	0.23	0.74	1.30	0.57	1.38	1.27	0.62

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1						
2						
3						
4			0.30			7.44
5			0.33			N/A
6			0.24			N/A
7			0.27			N/A
8			0.25			N/A
9						
10						
11			4.71			N/A
12			3.53			N/A
13			0.66			N/A
14			0.39			N/A
15			1.44			N/A
16						
17						
18			0.75			N/A
19			0.32			N/A
20			0.24			N/A
21			0.32			N/A
22			0.3			N/A
23						
24						
25			0.27			N/A
26			0.27			N/A
27			0.26			N/A
28			0.34			N/A
29			0.36			N/A
30						
31						

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.21			N/A
2			0.33			N/A
3			0.23			N/A
4			0.22			N/A
5			0.30			N/A
6						
7						
8			0.23			N/A
9			0.24			N/A
10			0.37			N/A
11			0.56			0.67
12			0.38			0.52
13						
14						
15			0.32			0.51
16			0.45			0.54
17			0.30			0.44
18			0.25			0.37
19			0.30			0.49
20						
21						
22			0.22			0.66
23			0.22			0.89
24			0.24			0.46
25			N/A			0.37
26			N/A			0.35
27						
28						

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.33			0.35
2			0.29			0.34
3			N/A			0.74
4			N/A			0.32
5			N/A			0.45
6						
7						
8			N/A			0.37
9			N/A			0.37
10			N/A			0.26
11			N/A			0.31
12			N/A			0.33
13						
14						
15			N/A			0.38
16			N/A			0.38
17			N/A			0.32
18			N/A			0.84
19			0.47			0.31
20						
21						
22			0.27			0.33
23			0.37			0.28
24			0.29			0.35
25			0.29			0.38
26			0.29			0.33
27						
28						
29			0.31			0.35
30			0.26			0.31
31			0.26			0.25

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.34			0.33
2						
3						
4						
5						
6			0.27			0.33
7			0.27			0.30
8			0.50			0.44
9			0.34			0.39
10						
11						
12			0.27			0.23
13			0.24			0.35
14			0.39			0.40
15			0.26			0.37
16			0.27			0.29
17						
18						
19			0.43			0.55
20			0.33			0.38
21			0.28			0.34
22			0.31			0.40
23			0.31			0.34
24						
25						
26			0.22			0.32
27			1.20			2.41
28			0.39			0.37
29			0.23			0.26
30			0.21			0.31

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1						
2						
3			0.17			0.27
4			0.29			0.23
5			0.12			0.30
6			0.37			0.17
7			0.14			0.17
8						
9						
10			0.20			0.13
11			0.17			0.20
12			0.23			0.25
13			0.23			0.34
14			0.14			0.20
15						
16						
17			0.26			0.18
18						
19			0.33			0.23
20			0.40			0.44
21			0.24			0.23
22						
23						
24						
25			0.26			0.14
26			0.17			0.49
27			0.15			0.41
28			0.20			0.20
29						
30						
31			0.34			0.18

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.35			0.45
2			6.99			1.17
3			0.82			0.49
4			0.43			0.27
5						
6						
7			0.45			0.15
8			0.91			0.15
9			0.94			0.29
10			0.95			0.17
11						
12						
13						
14			0.61			0.19
15			0.44			0.23
16			0.20			0.19
17			0.34			0.17
18			0.18			0.20
19						
20						
21			0.26			0.13
22			0.51			0.31
23			0.34			0.20
24			0.16			0.37
25			0.33			0.18
26						
27						
28			0.29			0.22
29			0.28			0.21
30			0.37			0.63

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1						
2						
3						
4						
5			0.18			0.21
6			0.33			0.50
7			0.42			0.19
8			0.56			0.44
9			0.45			0.51
10						
11						
12			0.18			0.18
13			0.40			0.20
14			0.28			0.13
15			0.16			0.33
16						
17						
18						
19			0.15			0.17
20			0.46			0.20
21			0.14			0.22
22			0.16			0.19
23			0.40			0.16
24						
25						
26			0.19			0.17
27			0.27			0.16
28			0.21			0.19
29			0.57			0.24
30			3.90			0.36
31						

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1						
2						
3			0.25			0.19
4			0.26			0.27
5			0.32			0.34
6			0.33			0.26
7						
8						
9			0.25			0.13
10			0.30			0.47
11			0.24			0.14
12			0.16			0.17
13			0.30			0.42
14						
15						
16			0.21			0.23
17			0.11			0.19
18			0.20			0.17
19			0.12			0.36
20			0.18			0.12
21						
22						
23			0.15			0.15
24			0.19			0.22
25			0.28			0.17
26			0.39			0.14
27			0.11			0.14
28						
29						
30			0.30			0.15
31			1.16			0.38

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.60			0.34
2			0.18			0.14
3			0.17			0.15
4						
5						
6						
7			0.10			0.18
8			0.20			0.21
9			0.13			0.20
10			0.17			0.12
11						
12						
13			0.37			0.23
14			0.53			0.24
15			0.33			0.34
16			0.35			0.17
17			0.26			0.15
18						
19						
20			0.39			2.54
21			0.21			0.27
22			0.32			0.15
23			1.19			0.28
24			0.92			0.36
25						
26						
27			0.23			0.30
28			0.51			0.68
29			0.20			0.41
30			0.16			0.19

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.23			0.24
2						
3						
4			0.26			0.25
5			0.19			0.16
6			0.13			0.22
7			0.17			0.15
8			0.10			0.11
9						
10						
11						
12			0.26			0.11
13			0.38			0.15
14			0.19			0.23
15			0.21			0.22
16						
17						
18			0.22			0.21
19			0.25			0.10
20			0.22			0.12
21			0.28			0.13
22			0.40			
23						
24						
25			1.31			397.00
26			6.83			0.48
27			0.61			0.84
28			0.41			0.60
29			0.78			0.28
30						
31						

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.89			7.33
2			0.46			0.99
3			0.31			0.57
4			0.44			0.24
5			0.78			0.71
6						
7						
8			0.97			0.94
9			0.74			0.66
10			0.24			0.48
11			0.25			0.28
12						
13						
14						
15			0.27			0.26
16			1.01			0.41
17			0.48			1.03
18			0.55			0.26
19						
20						
21						
22			0.21			0.22
23			0.30			0.57
24			0.50			0.26
25			0.46			0.34
26			0.45			0.70
27						
28						
29			0.45			0.20
30			0.46			0.64

	HARVEY CREEK			MAGNESIA CREEK		
Date	**Time**	**24 Hr Flow**	**NTU**	**Time**	**24 Hr Flow**	**NTU**
1			0.59			0.27
2			0.74			0.29
3			0.29			0.25
4						
5						
6			0.24			0.19
7			0.90			14.10
8			0.93			8.65
9			0.45			0.93
10			0.74			0.56
11						
12						
13			0.26			0.52
14						
15			0.20			0.43
16			0.44			0.39
17			0.26			0.35
18						
19						
20			0.23			0.31
21			0.80			0.43
22			0.31			
23			0.38			2.35
24			1.93			11.40
25						
26						
27			0.21			0.82
28			0.13			0.60
29			0.14			0.45
30						
31			0.11			0.35

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

ANNUAL REPORT

2010

Appendix C

Water Chemistry Test Results

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Certificate of Analysis

VILLAGE OF LIONS BAY
ATTN: CHUCK PARTRIDGE
PO BOX 141, 400 CENTER ROAD
LIONS BAY BC V0N 2E0

Report Date: 08-APR-10 19:33 (MT)
Version: FINAL

Lab Work Order #: L871061 **Date Received:** 22-MAR-10

Project P.O. #: NOT SUBMITTED
Job Reference:
Legal Site Desc:
CofC Numbers: 08-025128

Other Information:

Comments:

Selam Worku
Account Manager

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	L871061-1 22-MAR-10 09:40 MAGNESIA CREEK INTAKE	L871061-2 22-MAR-10 11:05 HARVEY CREEK INTAKE	L871061-3 22-MAR-10 08:50 PRV-3	L871061-4 22-MAR-10 08:50 PRV-3 (AFTER FLUSH)	L871061-5 22-MAR-10 09:05 PRV-5
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	11.9	4.9	5.0	4.7	11.5
	pH (pH)	7.11	6.24	6.66		7.06
	Total Suspended Solids (mg/L)	4.7	3.3	5.3		6.0
	Turbidity (NTU)	0.17	0.18	0.18		0.14
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.7	4.1	4.4		8.5
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.82	1.35	1.34		0.84
Total Metals	Aluminum (Al)-Total (mg/L)	0.027	0.078	0.150	0.058	0.027
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	0.00064	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.93	1.61	1.65	1.54	3.83
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	<0.0010	0.0040	0.202	0.0061	0.0094
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	0.083	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	0.00400	<0.00050	<0.00050
	Magnesium (Mg)-Total (mg/L)	0.51	0.21	0.22	0.20	0.47
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	0.0022	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	2.9
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<5.0	<5.0	<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)			<0.0010		<0.0010
	Bromoform (mg/L)			<0.0010		<0.0010
	Dibromochloromethane (mg/L)			<0.0010		<0.0010
	Chloroform (mg/L)			0.0096		0.0100
	Total THMs (mg/L)			0.0096		0.0100

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L871061-6 Description: Sampled Date: 22-MAR-10 Sampled Time: 09:05 Client ID: PRV-5 (AFTER FLUSH)	L871061-7 22-MAR-10 11:00 HARVEY TANK	L871061-8 22-MAR-10 11:00 HARVEY TANK (AFTER FLUSH)	L871061-9 22-MAR-10 09:25 MAGNESIA TANK	L871061-10 22-MAR-10 09:25 MAGNESIA TANK (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	12.0	4.8	4.7	11.4	11.9
	pH (pH)		6.74		7.06	
	Total Suspended Solids (mg/L)		4.0		4.7	
	Turbidity (NTU)		0.15		0.15	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		4.7		8.3	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.31		0.83	
Total Metals	Aluminum (Al)-Total (mg/L)	0.029	0.053	0.058	0.026	0.028
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.99	1.59	1.55	3.78	3.95
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0063	0.0060	<0.0010	0.0383	0.0160
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	0.034	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Magnesium (Mg)-Total (mg/L)	0.49	0.21	0.20	0.47	0.50
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	3.0	<2.0	<2.0	2.9	3.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0099		0.0102	
	Total THMs (mg/L)		0.0099		0.0102	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L871061-11 Description: Sampled Date: 22-MAR-10 Sampled Time: 12:00 Client ID: KELVIN GROVE	L871061-12 22-MAR-10 12:00 KELVIN GROVE (AFTER FLUSH)	L871061-13 22-MAR-10 10:20 BRUNSWICK BEACH	L871061-14 22-MAR-10 10:20 BRUNSWICK BEACH (AFTER FLUSH)	L871061-15 22-MAR-10 07:40 GENERAL STORE/CAF
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	6.1	7.2	11.8	12.6	5.2
	pH (pH)	7.90		7.88		6.76
	Total Suspended Solids (mg/L)	3.3		4.0		4.0
	Turbidity (NTU)	0.15		0.15		0.13
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	6.6		8.4		4.7
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.42		0.93		1.30
Total Metals	Aluminum (Al)-Total (mg/L)	0.055	0.094	0.016	0.031	0.039
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	0.00011	<0.00010	0.00011	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	2.14	2.63	3.99	4.24	1.73
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.301	0.0052	0.398	0.0065	0.173
	Iron (Fe)-Total (mg/L)	0.276	0.060	0.033	0.030	0.034
	Lead (Pb)-Total (mg/L)	0.0954	0.00107	0.00069	<0.00050	0.00956
	Magnesium (Mg)-Total (mg/L)	0.17	0.16	0.45	0.48	0.20
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	0.11	0.11	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.1	<2.0	2.9	2.9	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<5.0		<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0709		0.0279		0.0180
	Total THMs (mg/L)	0.0709		0.0279		0.0180

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L871061-16 Description: Sampled Date: 22-MAR-10 Sampled Time: 07:40 Client ID: GENERAL STORE/CAF (AFTER FLUSH)	L871061-17 22-MAR-10 08:00 ELEMENTARY SCHOOL	L871061-18 22-MAR-10 08:00 ELEMENTARY SCHOOL (AFTER FLUSH)	L871061-19 22-MAR-10 07:25 COMMUNITY CENTRE	L871061-20 22-MAR-10 07:25 COMMUNITY CENTER (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	4.8	11.2	12.0	5.5	5.0
	pH (pH)		7.07		6.72	
	Total Suspended Solids (mg/L)		4.7		4.0	
	Turbidity (NTU)		0.27		0.12	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		5.8		4.7	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		0.87		1.28	
Total Metals	Aluminum (Al)-Total (mg/L)	0.050	<0.010	0.030	0.013	0.051
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	1.60	3.70	3.97	1.86	1.70
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0178	1.11	0.188	0.998	0.0461
	Iron (Fe)-Total (mg/L)	0.056	0.037	0.059	<0.030	0.038
	Lead (Pb)-Total (mg/L)	<0.00050	0.0580	0.00164	0.0112	0.00071
	Magnesium (Mg)-Total (mg/L)	0.19	0.47	0.50	0.21	0.19
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.11	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	2.9	2.9	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	0.102	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0258		0.0177	
	Total THMs (mg/L)		0.0258		0.0177	

* Please refer to the Reference Information section for an explanation of any qualifiers detected.

Reference Information

Qualifiers for Sample Submission Listed:

Qualifier	Description
DSC:AP	Damaged Sample Container: Analysis Possible - sample # 9 - 1x 40mL vials' cap was broken and replaced.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-ED	Water	Total Organic Carbon	APHA 5310 B-Instrumental
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-TOT-DW-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-DW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-DW-MS-VA	Water	Total Metals in Water by ICPMS	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

THM-PT-MS-VA	Water	VOC (THM) by Purge and Trap with GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the purge and trap extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

Reference Information

URBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
ED	ALS LABORATORY GROUP - EDMONTON, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

08-025128

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

ALS Laboratory Group

ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Certificate of Analysis

VILLAGE OF LIONS BAY

ATTN: CHUCK PARTRIDGE

PO BOX 141, 400 CENTER ROAD

LIONS BAY BC V0N 2E0

Report Date: 06-JUL-10 17:24 (MT)

Version: FINAL

Lab Work Order #: L899883

Date Received: 21-JUN-10

Project P.O. #: NOT SUBMITTED

Job Reference:

Legal Site Desc:

CofC Numbers: 10-042992

Other Information:

Comments:

Selam Worku
Account Manager

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ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID	L899883-1	L899883-2	L899883-3	L899883-4	L899883-5
		Description					
		Sampled Date	21-JUN-10	21-JUN-10	21-JUN-10	21-JUN-10	21-JUN-10
		Sampled Time	10:00	10:00	11:20	11:20	09:15
		Client ID	MAGNESIA CREEK INTAKE (FIRST DRAW)	MAGNESIA CREEK INTAKE (AFTER FLUSH)	HARVEY CREEK INTAKE (FIRST DRAW)	HARVEY CREEK INTAKE (AFTER FLUSH)	PRV-3 (FIRST DRAW)
WATER							
Physical Tests	Hardness (as CaCO3) (mg/L)			6.8		3.2	3.2
	pH (pH)		6.26		6.28		6.33
	Total Suspended Solids (mg/L)		<3.0		<3.0		<3.0
	Turbidity (NTU)		0.16		0.18		0.16
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		3.1		3.0		4.0
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		0.72		0.85		0.92
Total Metals	Aluminum (Al)-Total (mg/L)			0.039		0.056	0.059
	Antimony (Sb)-Total (mg/L)			<0.00050		<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)			0.00032		0.00058	0.00066
	Barium (Ba)-Total (mg/L)			<0.020		<0.020	<0.020
	Boron (B)-Total (mg/L)			<0.10		<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)			<0.00020		<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)			2.27		1.08	1.08
	Chromium (Cr)-Total (mg/L)			<0.0020		<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)			<0.0010		<0.0010	0.0081
	Iron (Fe)-Total (mg/L)			<0.030		<0.030	<0.030
	Lead (Pb)-Total (mg/L)			<0.00050		<0.00050	<0.00050
	Magnesium (Mg)-Total (mg/L)			0.27		0.13	0.12
	Manganese (Mn)-Total (mg/L)			<0.0020		<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)			<0.00020		<0.00020	<0.00020
	Potassium (K)-Total (mg/L)			<0.10		<0.10	<0.10
	Selenium (Se)-Total (mg/L)			<0.0010		<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)			<2.0		<2.0	<2.0
	Uranium (U)-Total (mg/L)			<0.00010		<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)			<0.050		<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<5.0		<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)						
	Bromoform (mg/L)						
	Dibromochloromethane (mg/L)						
	Chloroform (mg/L)						
	Total THMs (mg/L)						

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID Description Sampled Date Sampled Time Client ID	L899883-6 21-JUN-10 09:15 PRV-3 (AFTER FLUSH)	L899883-7 21-JUN-10 09:30 PRV-5 (FIRST DRAW)	L899883-8 21-JUN-10 09:30 PRV-5 (AFTER FLUSH)	L899883-9 21-JUN-10 11:05 HARVEY TANK (FIRST DRAW)	L899883-10 21-JUN-10 11:05 HARVEY TANK (AFTER FLUSH)
WATER							
Physical Tests	Hardness (as CaCO3) (mg/L)		3.2	7.1	6.8	3.9	4.0
	pH (pH)			6.09		6.38	
	Total Suspended Solids (mg/L)			<3.0		<3.0	
	Turbidity (NTU)			0.22		0.14	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)			4.3		4.8	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)			0.83		0.89	
Total Metals	Aluminum (Al)-Total (mg/L)		0.060	0.046	0.051	0.060	0.061
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		0.00084	0.00081	0.00087	0.00100	0.00103
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)		1.07	2.40	2.28	1.38	1.38
	Chromium (Cr)-Total (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)		0.0062	0.0113	0.0078	0.0027	0.0027
	Iron (Fe)-Total (mg/L)		<0.030	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Magnesium (Mg)-Total (mg/L)		0.12	0.27	0.27	0.12	0.12
	Manganese (Mn)-Total (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)		<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)		<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)			<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)			<0.0010		<0.0010	
	Bromoform (mg/L)			<0.0010		<0.0010	
	Dibromochloromethane (mg/L)			<0.0010		<0.0010	
	Chloroform (mg/L)			0.0083		0.0185	
	Total THMs (mg/L)			0.0083		0.0185	

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L899883-11	L899883-12	L899883-13	L899883-14	L899883-15
	Description					
	Sampled Date	21-JUN-10	21-JUN-10	21-JUN-10	21-JUN-10	21-JUN-10
	Sampled Time	09:53	09:53	11:55	11:55	10:40
	Client ID	MAGNESIA TANK (FIRST DRAW)	MAGNESIA TANK (AFTER FLUSH)	KELVIN GROVE (FIRST DRAW)	KELVIN GROVE (AFTER FLUSH)	BRUNSWICK BEACH (FIRST DRAW)
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	7.4	7.1	6.1	5.9	8.4
	pH (pH)	6.32		6.56		6.50
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.19		0.15		0.14
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.2		5.8		4.7
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	0.70		0.91		0.71
Total Metals	Aluminum (Al)-Total (mg/L)	<0.010	0.045	0.084	0.084	0.017
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00081	0.00045	0.00054	0.00048	0.00057
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	2.49	2.38	2.26	2.20	2.86
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.997	0.0175	0.0028	0.0028	0.521
	Iron (Fe)-Total (mg/L)	0.148	<0.030	0.031	0.031	<0.030
	Lead (Pb)-Total (mg/L)	0.00192	<0.00050	0.00068	0.00068	0.00188
	Magnesium (Mg)-Total (mg/L)	0.29	0.27	0.11	0.11	0.29
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	0.077	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<5.0		<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0099		0.0434		0.0270
	Total THMs (mg/L)	0.0099		0.0434		0.0270

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L899883-16 Description: Sampled Date: 21-JUN-10 Sampled Time: 10:40 Client ID: BRUNSWICK BEACH (AFTER FLUSH)	L899883-17 21-JUN-10 07:30 STORE / CAFE (FIRST DRAW)	L899883-18 21-JUN-10 07:30 STORE / CAFE (AFTER FLUSH)	L899883-19 21-JUN-10 08:20 ELEMENTARY SCHOOL (FIRST DRAW)	L899883-20 21-JUN-10 08:20 ELEMENTARY SCHOOL (AFTER FLUSH)
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	7.9	3.5	3.5	7.4	7.2
	pH (pH)		6.52		6.33	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.16		0.20	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		3.7		4.3	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.24		0.83	
Total Metals	Aluminum (Al)-Total (mg/L)	0.040	0.054	0.056	<0.010	0.028
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00067	0.00076	0.00079	0.00062	0.00064
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	2.72	1.20	1.21	2.48	2.43
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0095	0.0263	0.0225	1.08	0.331
	Iron (Fe)-Total (mg/L)	<0.030	0.032	0.055	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	0.00191	<0.00050	0.0353	0.00203
	Magnesium (Mg)-Total (mg/L)	0.27	0.11	0.11	0.30	0.27
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)		<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0205		0.0383	
	Total THMs (mg/L)		0.0205		0.0383	

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L899883-21	L899883-22			
	Description					
	Sampled Date	21-JUN-10	21-JUN-10			
	Sampled Time	07:50	07:50			
	Client ID	COMMUNITY CENTRE (FIRST DRAW)	COMMUNITY CENTRE (AFTER FLUSH)			
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	4.1	3.9			
	pH (pH)	6.42				
	Total Suspended Solids (mg/L)	<3.0				
	Turbidity (NTU)	0.13				
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	3.8				
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.14				
Total Metals	Aluminum (Al)-Total (mg/L)	0.014	0.059			
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050			
	Arsenic (As)-Total (mg/L)	0.00057	0.00079			
	Barium (Ba)-Total (mg/L)	<0.020	<0.020			
	Boron (B)-Total (mg/L)	<0.10	<0.10			
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020			
	Calcium (Ca)-Total (mg/L)	1.44	1.38			
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020			
	Copper (Cu)-Total (mg/L)	0.801	0.0555			
	Iron (Fe)-Total (mg/L)	<0.030	0.040			
	Lead (Pb)-Total (mg/L)	0.00806	0.00088			
	Magnesium (Mg)-Total (mg/L)	0.13	0.11			
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020			
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020			
	Potassium (K)-Total (mg/L)	<0.10	<0.10			
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010			
	Sodium (Na)-Total (mg/L)	<2.0	<2.0			
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010			
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050			
Aggregate Organics	BOD (mg/L)	<5.0				
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010				
	Bromoform (mg/L)	<0.0010				
	Dibromochloromethane (mg/L)	<0.0010				
	Chloroform (mg/L)	0.0270				
	Total THMs (mg/L)	0.0270				

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-TOT-DW-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-DW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-DW-MS-VA	Water	Total Metals in Water by ICPMS	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

THM-PT-MS-VA	Water	VOC (THM) by Purge and Trap with GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the purge and trap extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA	Water	Total Trihalomethane-THM	CALCULATION
TSS-VA	Water	Total Suspended Solids by Gravimetric	APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA	Water	Turbidity by Meter	APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

Reference Information

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-042992

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

VILLAGE OF LIONS BAY
ATTN: CHUCK PARTRIDGE
PO BOX 141, 400 CENTER ROAD
LIONS BAY BC V0N 2E0
Phone: 604-921-9833

Date Received: 13-SEP-10
Report Date: 27-SEP-10 17:52 (MT)
Version: FINAL

Certificate of Analysis

Lab Work Order #: L930844
Project P.O. #: NOT SUBMITTED
Job Reference:
Legal Site Desc:
C of C Numbers: 10-044582

ERIN BOLSTER
Account Manager

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID: L930844-1 Description: MAGNESIA CREEK (AFTER FLUSH) Sampled Date: 13-SEP-10 Sampled Time: 09:50	Sample ID: L930844-2 Description: HARVEY CREEK (AFTER FLUSH) Sampled Date: 13-SEP-10 Sampled Time: 11:00	Sample ID: L930844-3 Description: PRV-3 (FIRST DRAW) Sampled Date: 13-SEP-10 Sampled Time: 09:10	Sample ID: L930844-4 Description: PRV-3 (AFTER FLUSH) Sampled Date: 13-SEP-10 Sampled Time: 09:10	Sample ID: L930844-5 Description: PRV-5 (FIRST DRAW) Sampled Date: 13-SEP-10 Sampled Time: 09:25
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	13.3	5.24	5.50	5.51	13.6
	pH (pH)	6.98	6.75	7.05		6.97
	Total Suspended Solids (mg/L)	<3.0	<3.0	<3.0		<3.0
	Turbidity (NTU)	0.14	0.16	0.21		0.31
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	4.6	4.3	5.0		5.2
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.35	1.47	1.75		1.42
Total Metals	Aluminum (Al)-Total (mg/L)	0.039	0.038	0.048	0.049	0.036
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00015	<0.00010	<0.00010	<0.00010	0.00012
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	4.59	1.77	1.86	1.87	4.65
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	<0.0010	<0.0020 DLB	<0.0080 DLB	<0.0070 DLB	<0.010 DLB
	Iron (Fe)-Total (mg/L)	<0.030	<0.030	<0.030	<0.030	0.113
	Lead (Pb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Magnesium (Mg)-Total (mg/L)	0.46	0.20	0.21	0.21	0.48
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	<2.0	<2.0	2.6
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<5.0	<5.0	<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)					<0.0010
	Bromoform (mg/L)					<0.0010
	Dibromochloromethane (mg/L)					<0.0010
	Chloroform (mg/L)					0.0187
	Total THMs (mg/L)					0.0187

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L930844-6	L930844-7	L930844-8	L930844-9	L930844-10
	Description					
	Sampled Date	13-SEP-10	13-SEP-10	13-SEP-10	13-SEP-10	13-SEP-10
	Sampled Time	09:25	10:55	10:55	09:45	09:45
	Client ID	PRV-5 (AFTER FLUSH)	HARVEY TANK (FIRST DRAW)	HARVEY TANK (AFTER FLUSH)	MAGNESIA TANK (FIRST DRAW)	MAGNESIA TANK (AFTER FLUSH)
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	13.9	6.58	6.09	19.0	13.3
	pH (pH)		7.06		6.94	
	Total Suspended Solids (mg/L)		<3.0		<3.0	
	Turbidity (NTU)		0.18		0.25	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)		5.0		5.4	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)		1.79		1.43	
Total Metals	Aluminum (Al)-Total (mg/L)	0.036	0.306	0.051	<0.010	0.034
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00014	0.00021	0.00013	<0.00010	0.00012
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	4.76	2.24	2.09	6.55	4.54
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	<0.0060 DLB	0.0129	0.0023	0.806	0.0172
	Iron (Fe)-Total (mg/L)	<0.030	0.725	<0.030	0.213	<0.030
	Lead (Pb)-Total (mg/L)	<0.00050	0.00312	<0.00050	0.00121	<0.00050
	Magnesium (Mg)-Total (mg/L)	0.48	0.24	0.21	0.64	0.48
	Manganese (Mn)-Total (mg/L)	<0.0020	0.0317	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	<0.10	0.11	<0.10	<0.10	<0.10
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	2.7	<2.0	<2.0	3.0	2.6
	Uranium (U)-Total (mg/L)	<0.00010	0.00015	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	0.069	<0.050
Aggregate Organics	BOD (mg/L)		<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)		<0.0010		<0.0010	
	Bromoform (mg/L)		<0.0010		<0.0010	
	Dibromochloromethane (mg/L)		<0.0010		<0.0010	
	Chloroform (mg/L)		0.0266		0.0116	
	Total THMs (mg/L)		0.0266		0.0116	

ALS LABORATORY GROUP ANALYTICAL REPORT

	Sample ID	L930844-11	L930844-12	L930844-13	L930844-14	L930844-15
	Description					
	Sampled Date	13-SEP-10	13-SEP-10	13-SEP-10	13-SEP-10	13-SEP-10
	Sampled Time	11:50	11:50	10:25	10:25	07:55
	Client ID	KELVIN GROVE (FIRST DRAW)	KELVIN GROVE (AFTER FLUSH)	BRUNSWICK BEACH (FIRST DRAW)	BRUNSWICK BEACH (AFTER FLUSH)	STORE / CAFE (FIRST DRAW)
Grouping	**Analyte**					
WATER						
Physical Tests	Hardness (as CaCO3) (mg/L)	9.17	6.79	18.9	19.5	7.22
	pH (pH)	7.09		6.99		6.76
	Total Suspended Solids (mg/L)	<3.0		<3.0		<3.0
	Turbidity (NTU)	0.16		0.16		0.35
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)	6.2		5.9		5.5
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)	1.76		1.28		1.80
Total Metals	Aluminum (Al)-Total (mg/L)	0.042	0.049	<0.010	0.024	0.024
	Antimony (Sb)-Total (mg/L)	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)	0.00010	0.00012	<0.00010	<0.00010	0.00010
	Barium (Ba)-Total (mg/L)	<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)	<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)	3.23	2.39	6.56	6.75	2.49
	Chromium (Cr)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)	0.0519	0.0041	0.402	0.0088	0.128
	Iron (Fe)-Total (mg/L)	0.037	<0.030	<0.030	<0.030	<0.030
	Lead (Pb)-Total (mg/L)	0.0330	0.00136	0.00226	<0.00050	0.0118
	Magnesium (Mg)-Total (mg/L)	0.27	0.20	0.61	0.63	0.25
	Manganese (Mn)-Total (mg/L)	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)	0.11	<0.10	<0.10	<0.10	0.12
	Selenium (Se)-Total (mg/L)	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)	<2.0	<2.0	2.9	2.9	<2.0
	Uranium (U)-Total (mg/L)	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)	<0.050	<0.050	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)	<5.0		<5.0		<5.0
Trihalomethanes	Bromodichloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Bromoform (mg/L)	<0.0010		<0.0010		<0.0010
	Dibromochloromethane (mg/L)	<0.0010		<0.0010		<0.0010
	Chloroform (mg/L)	0.0383		0.0129		0.0327
	Total THMs (mg/L)	0.0383		0.0129		0.0327

ALS LABORATORY GROUP ANALYTICAL REPORT

Grouping	Analyte	Sample ID Description Sampled Date Sampled Time Client ID	L930844-16 13-SEP-10 07:55 STORE / CAFE (AFTER FLUSH)	L930844-17 13-SEP-10 08:05 ELEMENTARY SCHOOL (FIRST DRAW)	L930844-18 13-SEP-10 08:05 ELEMENTARY SCHOOL (AFTER FLUSH)	L930844-19 13-SEP-10 07:30 COMMUNITY CENTRE (FIRST DRAW)	L930844-20 13-SEP-10 07:30 COMMUNITY CENTRE (AFTER FLUSH)
WATER							
Physical Tests	Hardness (as CaCO3) (mg/L)		6.50	18.6	18.8	7.97	6.99
	pH (pH)			6.79		6.99	
	Total Suspended Solids (mg/L)			<3.0		<3.0	
	Turbidity (NTU)			0.31		0.36	
Anions and Nutrients	Alkalinity, Total (as CaCO3) (mg/L)			5.2		6.1	
Organic / Inorganic Carbon	Total Organic Carbon (mg/L)			1.29		1.65	
Total Metals	Aluminum (Al)-Total (mg/L)		0.048	<0.010	0.030	0.025	0.049
	Antimony (Sb)-Total (mg/L)		<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
	Arsenic (As)-Total (mg/L)		0.00012	<0.00010	0.00011	<0.00010	0.00011
	Barium (Ba)-Total (mg/L)		<0.020	<0.020	<0.020	<0.020	<0.020
	Boron (B)-Total (mg/L)		<0.10	<0.10	<0.10	<0.10	<0.10
	Cadmium (Cd)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Calcium (Ca)-Total (mg/L)		2.23	6.31	6.45	2.51	2.46
	Chromium (Cr)-Total (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Copper (Cu)-Total (mg/L)		0.0194	0.716	0.0996	0.779	0.0601
	Iron (Fe)-Total (mg/L)		0.069	<0.030	0.031	<0.030	0.071
	Lead (Pb)-Total (mg/L)		<0.00050	0.0624	0.00248	0.0110	0.00105
	Magnesium (Mg)-Total (mg/L)		0.22	0.69	0.65	0.42	0.21
	Manganese (Mn)-Total (mg/L)		<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
	Mercury (Hg)-Total (mg/L)		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
	Potassium (K)-Total (mg/L)		0.11	<0.10	<0.10	0.12	0.15
	Selenium (Se)-Total (mg/L)		<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
	Sodium (Na)-Total (mg/L)		<2.0	2.7	2.8	<2.0	<2.0
	Uranium (U)-Total (mg/L)		<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
	Zinc (Zn)-Total (mg/L)		<0.050	0.203	<0.050	<0.050	<0.050
Aggregate Organics	BOD (mg/L)			<5.0		<5.0	
Trihalomethanes	Bromodichloromethane (mg/L)			<0.0010		<0.0010	
	Bromoform (mg/L)			<0.0010		<0.0010	
	Dibromochloromethane (mg/L)			<0.0010		<0.0010	
	Chloroform (mg/L)			0.0266		0.0369	
	Total THMs (mg/L)			0.0266		0.0369	

Reference Information

Qualifiers for Individual Parameters Listed:

Qualifier	Description
DLB	Detection limit was raised due to detection of analyte at comparable level in Method Blank.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-COL-VA	Water	Alkalinity by Colourimetric (Automated)	APHA 310.2

This analysis is carried out using procedures adapted from EPA Method 310.2 "Alkalinity". Total Alkalinity is determined using the methyl orange colourimetric method.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- "BIOCHEMICAL OXYGEN DEMAND"

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

BOD5-VA	Water	Biochemical Oxygen Demand- 5 day	APHA 5210 B- BIOCHEMICAL OXYGEN DEMAND

This analysis is carried out using procedures adapted from APHA Method 5210 B - "Biochemical Oxygen Demand (BOD)". All forms of biochemical oxygen demand (BOD) are determined by diluting and incubating a sample for a specified time period, and measuring the oxygen depletion using a dissolved oxygen meter. Dissolved BOD (SOLUBLE) is determined by filtering the sample through a glass fibre filter prior to dilution. Carbonaceous BOD (CBOD) is determined by adding a nitrification inhibitor to the diluted sample prior to incubation.

C-TOT-ORG-LOW-CL	Water	Total Organic Carbon	APHA 5310 C-Instrumental
HARDNESS-CALC-VA	Water	Hardness	APHA 2340B

Hardness is calculated from Calcium and Magnesium concentrations, and is expressed as calcium carbonate equivalents.

HG-TOT-DW-CVAFS-VA	Water	Total Mercury in Water by CVAFS	EPA 245.7

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves a cold-oxidation of the acidified sample using bromine monochloride prior to reduction of the sample with stannous chloride. Instrumental analysis is by cold vapour atomic fluorescence spectrophotometry (EPA Method 245.7).

MET-TOT-DW-ICP-VA	Water	Total Metals in Water by ICPOES	EPA SW-846 3005A/6010B

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedure involves preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A) and analysis by inductively coupled plasma - optical emission spectrophotometry (EPA Method 6010B).

MET-TOT-DW-MS-VA	Water	Total Metals in Water by ICPMS	EPA SW-846 3005A/6020A

This analysis is carried out using procedures adapted from "Standard Methods for the Examination of Water and Wastewater" published by the American Public Health Association, and with procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846 published by the United States Environmental Protection Agency (EPA). The procedures may involve preliminary sample treatment by acid digestion, using either hotblock or microwave oven (EPA Method 3005A). Instrumental analysis is by inductively coupled plasma - mass spectrometry (EPA Method 6020A).

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-MAN-VA	Water	pH by Manual Meter	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode.

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H "pH Value"

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

PH-PCT-VA	Water	pH by Meter (Automated)	APHA 4500-H pH Value

This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode

It is recommended that this analysis be conducted in the field.

THM-PT-MS-VA	Water	VOC (THM) by Purge and Trap with GCMS	EPA SW-846, METHOD 8260

This procedure is suitable for the analysis of trihalomethanes (chloroform, bromodichloromethane, dibromochloromethane, and bromoform) in chlorinated waters that have been treated to prevent the formation of trihalomethanes after sample collection. The analysis involves the purge and trap

Reference Information

extraction of the sample prior to analysis by capillary column gas chromatography with mass spectrometric detection (GC/MS). The trihalomethanes analysis is carried out using procedures adapted from "Test Methods for Evaluating Solid Waste" SW-846, Method 8260, published by the United States Environmental Protection Agency (EPA).

THM-SUM-CALC-VA Water Total Trihalomethane-THM CALCULATION

Total Trihalomethanes (where not conducted as part of a formation potential analysis) is equal to the sum of the individual parameter concentrations with non-detect results treated as zero.

TSS-VA Water Total Suspended Solids by Gravimetric APHA 2540 D - GRAVIMETRIC

This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 "Turbidity"

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

TURBIDITY-VA Water Turbidity by Meter APHA 2130 Turbidity

This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method.

* ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
CL	ALS LABORATORY GROUP - CALGARY, ALBERTA, CANADA
VA	ALS LABORATORY GROUP - VANCOUVER, BC, CANADA

Chain of Custody Numbers:

10-044582

GLOSSARY OF REPORT TERMS

Surrogate A compound that is similar in behaviour to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.
mg/kg milligrams per kilogram based on dry weight of sample.
mg/kg wwt milligrams per kilogram based on wet weight of sample.
mg/kg lwt milligrams per kilogram based on lipid-adjusted weight of sample.
mg/L milligrams per litre.
< - Less than.
D.L. The reported Detection Limit, also known as the Limit of Reporting (LOR).
N/A Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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2010

Appendix D

Emergency Response Plan

CONTENTS

BOIL WATER ADVISORY

If there is a need, or if Vancouver Coastal Health Authority (VCHA) orders the Village to issue a Boil Water Advisory (BWA):

- Notify the Manager of Public Works or his designated (person in charge),
- Identify the affected area,
- The person in charge will contact the Public Health Inspector (PHI),
- The person in charge will copy and have delivered by hand a printed BWA and post a notice at Lions bay School, Lions Bay Post Office, Lions Bay General Store / Café, and Child Care facilities,
- The person in charge will, when appropriate, notify the radio and television stations that are listed in the plan,
- When it has been determined that all hazards and problems have been alleviated, the PHI will lift the BWA,
- The person in charge will reverse the above actions notifying all those concerned, and
- The person in charge will record all of the pertinent information regarding the event and prepare a report for the Medical Health Officer.

POWER FAILURES

In the event of a Power Failure:

- Notify the Manager of Public Works or his designated,
- Determine the extent of the outage,
- Notify BC Hydro,
- During the power outage, the power generators at the Treatment Plants need to be checked constantly for level of Fuel.
- Monitor the tanks levels,
- Monitor and record the Chlorine Residual in the system,
- When the power comes back on, check the Plants for normal function.
- Reset all alarms, and
- Reset all the pumps including the STP.

EARTHQUAKES

In the event of an earthquake:

- Notify the Manager of Public Works or his designated,
- Begin a system wide check for leaks or any other failures,
- Shut down any areas that appear to have problems,
- Notify VCHA if sections have been shut down and if necessary issue a BWA,
- Repair and flush lines with treated water, and
- Retest all zones and monitor.

FIRE IN THE WATERSHED

In the event of a forest fire in the watershed:

- Notify the Manager of Public Works or his designated,
- Notify BC Department of Forest,
- Call 911 and let them dispatch the affected Fire Department,
- Shut down the system at the affected intake,
- Notify Vancouver Coastal Health Authority,
- Notify Council,
- Monitor Raw Water for any contaminants, and
- Let BC Forest service know that we have an intake below and that we need to know if they are going to water bomb with any chemicals.

WATER PUMP FAILURE

In the event of a pump failure:

- Notify the Manager of Public Works or his designated,
- Shut down the affected pump,
- Notify all affected residents, and
- Change or repair pump and flush the affected area with treated water.

CHEMICAL CONTAMINATION

In the event of Chemical contamination such as oil, fuel, pesticides or any other type of substance that gets into or threatens to get into our water system including forest fire fighting activities:

- Notify the Manager of Public Works or his designated,
- Shut down the affected intake or line,
- Begin determining the extent of contamination,
- Notify Vancouver Coastal Health Authority who will issue a “No Use Order”,
- Call the listed radio and television stations and have them broadcast a “No Use Order” to the affected area,
- Hand deliver “Do Not Use Water” notices to the affected areas,
- Remedy the problem to the satisfaction of the Vancouver Coastal Health Authority, and
- Notify all those affected that the water is now safe to use again.

DISINFECTION INTERRUPTION

In the event of an interruption of the Treatment Plant:

- Notify the Manager of Public Works or his designated,
- Check and record the Chlorine Residual in the affected water tank,
- Shut down the Treatment Plant,

- Shut down the intake valve for the water tank,
- Determine the amount of down time that is available before we need to refill the water tank,
- Begin repairs on the Treatment Plant,
- If the downtime is going to be too long and we have to fill the tank, notify Vancouver Coastal Health Authority and issue a BWA, and
- Add chlorine to reservoir manually and check residual on ongoing basis.

LOSS OF PRESSURE

In the event of a system pressure loss due to high demand from high fire flow or a severe leak:

- Notify the Manager of Public Works or his designated,
- Determine if there was a negative pressure or if there was always positive pressure,
- If a negative pressure is suspected, notify Vancouver Coastal Health Authority who will determine if we need to issue a BWA, and
- Flush the affected area and record the results and give them to the Health Inspector.

TURBIDITY EVENTS

If the Turbidity is in the range of 1-3 NTU, increase monitoring. If the Turbidity reaches 4 NTU prepare to Take Off the system. If the Turbidity reaches 5 NTU or more:

- Notify the Manager of Public Works or his designated,
- Contact Vancouver Coastal Health Authority and possibly issue a BWA,
- Check and record the Chlorine Residual that is present at the same site as the turbidity sample was taken, and
- Check with other purveyors like the District of West Vancouver to see at what point high turbidity events correlate with positive water samples.

WATER LINE BREAKS

In the event of a water line break, where water pressure has maintained until the leak has been exposed so that there is no danger of any material flowing back into the break, there will be no need for any special condition to be applied. Flush the repair area with treated water before placing that area back in service.

In the event that the broken line is suspected of having a negative pressure:

- Notify the Manager of Public Works or his designated,
- Notify the Vancouver Coastal Health Authority for a possible BWA,
- Repair the break and flush the area with treated water, and
- Rescind the BWA if necessary.

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix E

Sample Boil Water Advisory

THE MUNICIPALITY OF THE VILLAGE OF LIONS BAY

NOTICE TO RESIDENTS

of Lions Bay and Brunswick Beach

BOIL WATER ADVISORY

until further notice.

Due to high turbidity and low chlorine residual – we are issuing an immediate boil water advisory – We will keep you posted as to when this will be lifted –

Residents can disinfect their water by either:

1. Boiling the water for 2 minutes, or
2. Adding 4 drops of household bleach per gallon of water (.8 drops if water is cloudy), stirring and waiting for 20 minutes before consumption.

This includes water used for brushing teeth, cooking, washing dishes, and washing ready-to-eat fruit and vegetables.

Village of Lions Bay
October 26, 2010

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix F

VCH Permits to Operate

Vancouver CoastalHealth
Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT
TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number: 3317552348

Name of Facility: Lions Bay Harvey Creek Water System

Address: Upper Oceanview Road
Lions Bay, BC

Owner: Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010
Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Place Decal Here

ENV20 - 08/03

Vancouver CoastalHealth
Promoting wellness. Ensuring care.

Vancouver Coastal Health

PERMIT
TO OPERATE

Drinking Water System 301-10,000 Connections

Facility Number: 3317552347

Name of Facility: Lions Bay Magnesia Creek Water System

Address: Upper Sunset Road
Lions Bay, BC

Owner: Municipality of The Village of Lions Bay

Conditions:

1. Submit weekly water samples for bacteriological testing at sites approved by VCH.
2. Chlorine residuals must be recorded daily at locations approved by VCH.
3. Biannual flushing on the entire distribution system.
4. Daily turbidity testing.
5. Annual chemical testing of source
6. Submit annual updated ERP to VCH.

September 29, 2010
Effective Date

Rod Schluter
Environmental Health Officer

This permit must be displayed in a conspicuous place and is nontransferable.

Place Decal Here

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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Appendix G

EOCP Facility Classification

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Facility Classification

THIS IS TO CERTIFY THAT

Village of Lions Bay
Water System

has been classified by the Environmental Operators Certification Program in accordance with the guidelines established in co-operation with the Association of Boards of Certification (A.B.C.) as

Class II

Dated at Burnaby, B.C.on July 28, 2003

Secretary - Certification Board

Chairman - Certification Board

CERTIFICATE NO.675

eocp

MEMBER OF ASSOCIATION OF BOARDS OF CERTIFICATION
AFFILIATE OF B.C. WATER AND WASTE ASSOCIATION
A Society Incorporated under the Society Act, S.B.C. S-28724

The Municipality of the Village of Lions Bay

DRINKING WATER QUALITY

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2010

Appendix H

EOCP Operator Certificates

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Certificate of Qualification

This is to certify that:

Alberto Urrutia

By Examination Has Qualified As A

Water Distribution System Operator

and certifies that he/she has met the established qualifications and has the ability to efficiently operate and maintain a specified maximum size and type of water distribution system designated as follows:

Level II

Secretary - Certification Board

Chairman - Certification Board

July 12, 2006

Certificate No: 4766

eocp

Member of Association of Boards of Certification
Affiliate of B.C. Water and Waste Association

This certificate shall be in full force and effect when accompanied by an annual renewal seal

A Society Incorporated under the Society Act, S.B.C. S-28724

ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM

Course Completion Certificate

This is to certify that

Alberto Urrutia

By Examination Has Qualified As A

Chlorine Handler

Secretary - Certification Board

Chairman - Certification Board

May 6, 2005

Certificate No. CH-4766

eocp