

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	ALBRO LAKE	BARRETT LAKE	BELL LAKE	BISSETT LAKE	BLACK DUCK POND	BLACK POINT LAKE	CRANBERRY LAKE	DE SAID LAKE	DRAIN LAKE
Community				Dartmouth	Beaverbank	Dartmouth	Cole Harbour	Lakeside	Hubley	Dartmouth	Dartmouth	Middle Sackville
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			15/08/2011 14:15	16/08/2011 11:25	02/08/2011 14:05	04/08/2011 9:40	22/08/2011 12:25	24/08/2011 11:25	04/08/2011 14:15	18/08/2011 8:50	18/08/2011 14:15
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		5.7	3.2	N/A	1.6	N/A	0.6	N/A	N/A	N/A
Temp	Celsius	N/A		23.00	22.41	21.56	20.40	22.45	21.35	20.21	21.95	24.46
Dissolved Oxygen	mg/L	0.2	6-9.5	9.26	9.10	9.28	8.27	7.71	7.62	7.71	9.43	10.05
pH	pH	N/A	6.5-9.0	7.01	6.89	7.21	7.00	5.89	5.35	7.01	6.72	7.06
Specific Conductance	mS/cm	0.001		0.385	0.200	0.056	0.430	0.348	0.081	0.311	0.096	0.189
TDS	g/L	0.01		0.250	0.130	0.036	0.280	0.226	0.053	0.212	0.062	0.123
Salinity	ppt	0.01		0.18	0.09	0.03	0.21	0.17	0.04	0.15	0.04	0.09
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		11	15	ND	36	6	ND	30	23	14
Dissolved Chloride (Cl)	mg/L	1		96	44	12	102	68	20	72	14	42
Colour	TCU	5		30	16	ND	14	46	206	30	19	19
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		2.1	2.0	ND	0.8	1.9	1.3	0.4	1.5	2.3
Nitrate + Nitrite	mg/L	0.05	13000	ND	ND	ND	ND	0.10	0.05	0.08	ND	ND
Nitrate (N)	mg/L	0.05		ND	ND	ND	ND	0.10	0.05	0.08	ND	ND
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND	ND	ND	0.05	ND
Total Organic Carbon (C)	mg/L	0.5		3.5	5.2	3.5	5.6	9.4	16.5	5.5	6.5	9.7
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.6	7.6	6.9	7.9	6.6	5.8	7.7	7.8	7.4
Total Phosphorus (1M depth)	mg/L	0.001		0.011	0.008	0.008	0.017	0.013	0.009	0.028	0.008	0.037
Total Phosphorus Deep (if stratified)	mg/L			N/A	0.008	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reactive Silica (SiO2)	mg/L	0.5		1.7	1.8	1.0	0.9	5.8	2.0	1.0	2.3	1.7
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	6	ND	ND	ND	8
Dissolved Sulphate (SO4)	mg/L	2		9	7	5	11	47	2	9	3	10
Turbidity	NTU	0.1		0.6	1.2	1.1	3.3	3.7	2.0	1.3	1.1	5.0
Conductivity	uS/cm	1		373	195	53	423	336	82	308	92	181
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		3.11	1.69	0.44	3.82	3.02	0.61	2.82	0.92	1.67
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		11	15	ND	36	6	ND	30	23	14
Calculated TDS	mg/L	1		187	98	29	217	188	41	165	48	98
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		3.36	1.74	0.58	3.74	3.21	0.83	3.01	0.84	1.74
Hardness (CaCO3)	mg/L	1		25	23	11	52	57	7	45	21	24
Ion Balance (% Difference)	%	N/A		3.9	1.6	13.5	1.0	3.0	15.5	3.2	4.4	1.9
Langelier Index (@ 20C)	N/A	N/A		-2.04	-1.97	-6.31	-0.92	-2.96	-7.49	-1.24	-1.57	-2.17
Langelier Index (@ 4C)	N/A	N/A		-2.36	-2.29	-6.63	-1.24	-3.28	-7.81	-1.56	-1.89	-2.49
Saturation pH (@ 20C)	N/A	N/A		9.64	9.57	13.21	8.82	9.56	13.29	8.94	9.37	9.57
Saturation pH (@ 4C)	N/A	N/A		9.96	9.89	13.53	9.14	9.88	13.61	9.26	9.69	9.89
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		34	53	56	33	309	297	17	31	162
Total Antimony (Sb)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	ug/L	2		ND	ND	ND	ND	ND	2	ND	ND	ND
Total Barium (Ba)	ug/L	5		6	18	11	13	16	20	12	8	9
Total Beryllium (Be)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	ug/L	5		8	9	6	14	11	7	12	14	13
Total Cadmium (Cd)	ug/L	0.017		ND	ND	0.051	0.045	0.143	ND	0.036	ND	ND

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Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	ALBRO LAKE	BARRETT LAKE	BELL LAKE	BISSETT LAKE	BLACK DUCK POND	BLACK POINT LAKE	CRANBERRY LAKE	DE SAID LAKE	DRAIN LAKE
Community				Dartmouth	Beaverbank	Dartmouth	Cole Harbour	Lakeside	Hubley	Dartmouth	Dartmouth	Middle Sackville
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			15/08/2011 14:15	16/08/2011 11:25	02/08/2011 14:05	04/08/2011 9:40	22/08/2011 12:25	24/08/2011 11:25	04/08/2011 14:15	18/08/2011 8:50	18/08/2011 14:15
Total Calcium (Ca)	mg/L	0.1		8.5	7.0	2.1	17.5	18.8	1.8	15.4	6.6	7.5
Total Chromium (Cr)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	1	1
Total Cobalt (Co)	ug/L	1		ND	ND	ND	ND	2	ND	ND	ND	ND
Total Copper (Cu)	ug/L	2		ND	ND	ND	2	2	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		111	187	57	160	480	1080	132	193	642
Total Lead (Pb)	ug/L	0.5		ND	ND	ND	ND	0.5	0.9	ND	ND	0.9
Total Magnesium (Mg)	mg/L	0.1		1.0	1.3	1.3	1.9	2.5	0.5	1.6	1.0	1.2
Total Manganese (Mn)	ug/L	2		105	75	50	179	277	60	210	69	96
Total Molybdenum (Mo)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	ND	ND	ND	11	ND	ND	ND	3
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Potassium (K)	mg/L	0.1		0.8	1.0	0.7	1.5	1.7	0.5	0.9	0.2	1.0
Total Selenium (Se)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		64.9	28.5	7.8	61.1	44.9	14.1	47.5	9.3	27.4
Total Strontium (Sr)	ug/L	5		39	24	11	48	62	10	42	29	24
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	ug/L	2		ND	ND	ND	ND	5	2	ND	ND	2
Total Uranium (U)	ug/L	0.1		ND	ND	ND	ND	0.2	0.2	ND	ND	ND
Total Vanadium (V)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Zinc (Zn)	ug/L	5		ND	ND	ND	ND	26	ND	ND	ND	20
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		8	4	15	96	17	2	58	2	9
E. Coli Outlet	MPN/100mL	1		111	1414	17	17	--	3	75	12	--
Chlorophyll A - Acidification method	µg/L	N/A		2.34	4.71	6.33	28.31	4.10	16.22	13.72	1.85	24.79
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.97	3.90	6.03	27.49	3.74	15.16	12.13	1.58	25.02

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWL for Clayton Developments; North Inlet data shown  
 Morris Lake - sampled by JWL for HRM
- CCME - Canadian Council of Ministers of Environment Guidelines for the Protection of Aquatic Life  
 Fecal Coliform Guideline: for Contact Recreation  
 Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life stage  
 Bacterial level of concern for swimming ( ≥ 200 but < 400 )  
 Bacterial level unsuitable for swimming ( ≥ 400 )

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Summer 2011	Units	RDL	CCME Guideline Level†	DUCK LAKE	FENERTY LAKE	FIRST CHAIN LAKE	FIRST LAKE	FLETCHERS LAKE	FRENCHMAN LAKE	FROG POND*	GOVERNOR'S LAKE	GRAND LAKE
Community				Beaverbank	Beaverbank	Halifax	Lower Sackville	Fall River	Burnside	Halifax	Timberlea	Enfield
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/08/2011 0:00	06/08/2011 15:05	22/08/2011 14:10	12/08/2011 11:30	10/08/2011 11:25	05/08/2011 13:20	25/08/2011 9:00	24/08/2011 12:45	10/08/2011 9:55
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		0.9	1.4	N/A	5.1	2.9	N/A	2.1	1.8	4.0
Temp	Celsius	N/A		23.12	22.35	23.47	20.36	20.66	19.32	21.98	21.95	20.22
Dissolved Oxygen	mg/L	0.2	6-9.5	9.55	10.32	9.04	8.90	8.55	9.01	8.21	9.71	9.32
pH	pH	N/A	6.5-9.0	6.87	7.18	5.25	6.97	6.56	7.31	6.28	6.05	6.34
Specific Conductance	mS/cm	0.001		0.211	0.071	0.348	0.431	0.140	0.363	0.309	0.294	0.102
TDS	g/L	0.01		0.137	0.046	0.226	0.280	0.091	0.236	0.201	0.191	0.066
Salinity	ppt	0.01		0.10	0.03	0.17	0.21	0.07	0.17	0.15	0.14	0.05
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		35	ND	ND	29	11	21	31	5	ND
Dissolved Chloride (Cl)	mg/L	1		37	14	90	99	30	93	69	63	20
Colour	TCU	5		30	28	ND	28	36	43	29	71	32
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		3.4	2.7	1.0	2.2	3.4	0.6	1.5	1.2	2.6
Nitrate + Nitrite	mg/L	0.05	13000	ND	ND	ND	ND	0.17	ND	0.42	0.35	0.08
Nitrate (N)	mg/L	0.05		ND	ND	ND	ND	0.17	ND	0.42	0.35	0.08
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	0.07	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		9.8	8.8	ND	3.5	6.1	9.0	9.1	10.5	5.0
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	8.0	7.0	5.0	7.9	7.3	7.6	8.0	7.0	7.1
Total Phosphorus (1M depth)	mg/L	0.001		0.038	0.019	ND	0.007	0.009	0.017	0.010	0.014	0.006
Total Phosphorus Deep (if stratified)	mg/L			N/A	N/A	N/A	0.007	N/A	N/A	N/A	0.018	N/A
Reactive Silica (SiO2)	mg/L	0.5		1.9	1.0	2.4	0.7	1.4	0.8	2.9	3.5	0.9
Total Suspended Solids	mg/L	5		8	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		5	5	14	12	7	8	15	16	8
Turbidity	NTU	0.1		5.5	3.4	0.2	1.4	1.4	1.1	1.8	1.4	0.5
Conductivity	uS/cm	1		208	70	333	420	136	354	307	295	99
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		1.85	0.50	2.83	3.62	1.22	3.21	2.91	2.23	0.74
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		35	ND	ND	29	11	21	31	5	ND
Calculated TDS	mg/L	1		112	32	176	211	70	207	173	141	47
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.26	0.60	3.21	3.74	1.18	4.18	3.09	2.59	0.87
Hardness (CaCO3)	mg/L	1		38	10	16	48	16	36	40	25	15
Ion Balance (% Difference)	%	N/A		10.0	8.9	6.3	1.6	1.7	13.2	3.0	7.4	8.5
Langelier Index (@ 20C)	N/A	N/A		-0.95	-6.09	-7.92	-1.06	-2.52	-1.62	-1.00	-3.00	-5.77
Langelier Index (@ 4C)	N/A	N/A		-1.27	-6.41	-8.24	-1.38	-2.84	-1.94	-1.32	-3.32	-6.09
Saturation pH (@ 20C)	N/A	N/A		8.95	13.09	12.92	8.96	9.82	9.22	9.00	10.00	12.87
Saturation pH (@ 4C)	N/A	N/A		9.27	13.41	13.24	9.28	10.14	9.54	9.32	10.32	13.19
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		209	108	198	43	69	--	46	183	44
Total Antimony (Sb)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Arsenic (As)	ug/L	2		ND	ND	ND	ND	2	--	ND	ND	ND
Total Barium (Ba)	ug/L	5		25	8	20	20	11	--	16	19	8
Total Beryllium (Be)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Boron (B)	ug/L	5		11	9	7	11	6	--	18	15	6
Total Cadmium (Cd)	ug/L	0.017		ND	ND	0.058	0.048	0.048	--	ND	0.037	0.042

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Community				Beaverbank	Beaverbank	Halifax	Lower Sackville	Fall River	Burnside	Halifax	Timberlea	Enfield
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/08/2011 0:00	06/08/2011 15:05	22/08/2011 14:10	12/08/2011 11:30	10/08/2011 11:25	05/08/2011 13:20	25/08/2011 9:00	24/08/2011 12:45	10/08/2011 9:55
Total Calcium (Ca)	mg/L	0.1		12.4	2.8	4.9	15.6	5.1	9.6	13.2	8.0	4.8
Total Chromium (Cr)	ug/L	1		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Cobalt (Co)	ug/L	1		ND	ND	2	ND	ND	--	ND	ND	ND
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	2	ND
Total Iron (Fe)	ug/L	50		963	237	143	86	136	56	234	238	67
Total Lead (Pb)	ug/L	0.5		0.5	ND	ND	ND	ND	--	ND	ND	ND
Total Magnesium (Mg)	mg/L	0.1		1.6	0.7	1.0	2.1	0.7	1.5	1.6	1.3	0.6
Total Manganese (Mn)	ug/L	2		565	41	90	26	51	20	58	48	8
Total Molybdenum (Mo)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	ND	3	ND	ND	--	ND	3	ND
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Potassium (K)	mg/L	0.1		1.2	0.6	0.7	1.6	0.9	1	1.3	1.1	0.7
Total Selenium (Se)	ug/L	1		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		32.1	8.3	64.8	62.8	19.1	44.7	51.6	46.5	12.8
Total Strontium (Sr)	ug/L	5		36	12	28	43	20	--	49	40	18
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Titanium (Ti)	ug/L	2		6	ND	ND	ND	ND	--	ND	ND	ND
Total Uranium (U)	ug/L	0.1		ND	ND	ND	ND	ND	--	ND	0.4	ND
Total Vanadium (V)	ug/L	2		ND	ND	ND	ND	ND	--	ND	ND	ND
Total Zinc (Zn)	ug/L	5		ND	ND	11	ND	ND	ND	ND	9	ND
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		5	1	ND	1	30	31	12	148	ND
E. Coli Outlet	MPN/100mL	1		25	2	--	6	19	25	5	276	--
Chlorophyll A - Acidification method	µg/L	N/A		25.14	24.26	0.16	3.74	3.99	4.59	6.72	21.98	3.67
Chlorophyll A - Welschmeyer method	µg/L	N/A		21.46	20.37	0.13	3.28	3.42	4.27	6.13	19.58	3.13

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWJ  
 Morris Lake - sampled by JWJ
- CCME - Canadian Council of Ministers of the Environment  
 Fecal Coliform Guideline: for C  
 Dissolved Oxygen Guideline: 100%  
 Bacterial level of concern for surface water  
 Bacterial level unsuitable for swimming

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Summer 2011	Units	RDL	CCME Guideline Level†	HALF MILE LAKE	HUBLEY BIG LAKE	KEARNEY LAKE <sup>1</sup>	KIDSTON LAKE	KINSAC LAKE	LAKE BANOOK	LAKE CHARLES	LAKE ECHO	LAKE MICMAC
Community				Timberlea	Hubley	Bedford	Spryfield	Fall River	Dartmouth	Dartmouth	Eastern Shore	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			22/08/2011 11:20	24/08/2011 9:25	14/08/2011 14:00	23/08/2011 0:00	11/08/2011 9:10	08/08/2011 8:55	05/08/2011 12:00	08/08/2011 11:10	05/08/2011 9:50
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		N/A	1.2	N/A	1.5	2.4	3.7	2.5	1.2	2.8
Temp	Celsius	N/A		21.69	21.85	19.10	21.61	19.88	21.96	20.37	20.72	20.45
Dissolved Oxygen	mg/L	0.2	6-9.5	6.87	8.65	7.06	8.81	8.45	9.34	9.43	8.51	8.65
pH	pH	N/A	6.5-9.0	6.06	5.03	5.90	5.64	6.77	7.50	7.31	5.39	7.10
Specific Conductance	mS/cm	0.001		0.166	0.066	0.067	0.044	0.085	0.630	0.231	0.035	0.578
TDS	g/L	0.01		0.108	0.043	--	0.020	0.055	0.410	0.150	0.023	0.375
Salinity	ppt	0.01		0.08	0.03	--	0.02	0.04	0.31	0.11	0.01	0.28
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		15	ND	7	10	9	32	18	ND	34
Dissolved Chloride (Cl)	mg/L	1		34	15	14	5	18	168	52	6	153
Colour	TCU	5		155	85	110	122	52	ND	17	114	5
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		1.8	1.7	--	1.3	2.3	ND	ND	0.5	ND
Nitrate + Nitrite	mg/L	0.05	13000	ND	0.05	0.07	ND	ND	ND	0.16	ND	ND
Nitrate (N)	mg/L	0.05		ND	0.05	--	ND	ND	ND	0.16	ND	ND
Nitrite (N)	mg/L	0.05		ND	ND	--	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	0.09	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		15.9	8.2	10.0	13.9	8.3	2.9	5.0	11.6	3.9
Orthophosphate (P)	mg/L	0.01		ND	ND	0.01	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.2	5.8	6.40	7.0	7.1	8.0	7.7	6.1	7.9
Total Phosphorus (1M depth)	mg/L	0.001		0.026	0.014	0.008	0.013	0.011	0.013	0.004	0.018	0.018
Total Phosphorus Deep (if stratified)	mg/L			N/A	N/A	N/A	0.029	N/A	0.012	N/A	N/A	N/A
Reactive Silica (SiO2)	mg/L	0.5		1.3	1.2	4.3	1.1	0.9	1.1	2.4	2.1	1.2
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		5	3	ND	3	5	18	10	4	16
Turbidity	NTU	0.1		1.9	1.3	0.7	1.7	1.9	0.9	1.3	1.4	1.5
Conductivity	uS/cm	1		157	66	66	43	81	614	222	33	562
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		1.36	0.49	0.53	0.40	0.79	5.75	2.04	0.25	5.32
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		15	ND	7	10	9	32	18	ND	34
Calculated TDS	mg/L	1		84	32	34	23	45	339	131	17	327
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.62	0.63	0.55	0.46	0.78	6.01	2.59	0.33	6.16
Hardness (CaCO3)	mg/L	1		16	5	9	12	13	65	30	6	64
Ion Balance (% Difference)	%	N/A		8.8	12.4	1.85	6.8	0.5	2.2	11.7	12.6	7.3
Langelier Index (@ 20C)	N/A	N/A		-2.50	-7.62	-3.66	-2.93	-2.90	-0.78	-1.66	-8.21	-0.86
Langelier Index (@ 4C)	N/A	N/A		-2.82	-7.94	-3.91	-3.25	-3.22	-1.10	-1.98	-8.53	-1.18
Saturation pH (@ 20C)	N/A	N/A		9.70	13.42	10.10	9.93	10.00	8.78	9.36	14.31	8.76
Saturation pH (@ 4C)	N/A	N/A		10.02	13.74	10.30	10.25	10.32	9.10	9.68	14.63	9.08
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		276	248	--	214	113	7	--	325	--
Total Antimony (Sb)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Arsenic (As)	ug/L	2		ND	ND	--	ND	ND	5	--	ND	--
Total Barium (Ba)	ug/L	5		22	9	--	ND	12	15	--	ND	--
Total Beryllium (Be)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Bismuth (Bi)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Boron (B)	ug/L	5		12	9	--	8	8	12	--	6	--
Total Cadmium (Cd)	ug/L	0.017		0.027	0.030	--	ND	0.034	0.045	--	0.050	--

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	HALF MILE LAKE	HUBLEY BIG LAKE	KEARNEY LAKE <sup>1</sup>	KIDSTON LAKE	KINSAC LAKE	LAKE BANOOK	LAKE CHARLES	LAKE ECHO	LAKE MICMAC
Community				Timberlea	Hubley	Bedford	Spryfield	Fall River	Dartmouth	Dartmouth	Eastern Shore	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			22/08/2011 11:20	24/08/2011 9:25	14/08/2011 14:00	23/08/2011 0:00	11/08/2011 9:10	08/08/2011 8:55	05/08/2011 12:00	08/08/2011 11:10	05/08/2011 9:50
Total Calcium (Ca)	mg/L	0.1		5.0	1.3	2.5	3.9	4.0	22.7	--	1.6	22.3
Total Chromium (Cr)	ug/L	1		ND	ND	--	ND	ND	ND	--	ND	--
Total Cobalt (Co)	ug/L	1		ND	ND	--	ND	ND	ND	--	ND	--
Total Copper (Cu)	ug/L	2		2	ND	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		830	280	418	396	175	55	149	352	72
Total Lead (Pb)	ug/L	0.5		0.6	0.7	--	ND	ND	ND	--	0.6	--
Total Magnesium (Mg)	mg/L	0.1		0.9	0.5	0.6	0.6	0.8	2.1	1.4	0.4	2.1
Total Manganese (Mn)	ug/L	2		122	32	68.4	20	30	52	33	62	77
Total Molybdenum (Mo)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Nickel (Ni)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Phosphorous (P)	mg/L	0.1		ND	ND	0.008	ND	ND	ND	--	ND	--
Total Potassium (K)	mg/L	0.1		1.0	0.5	0.497	0.5	0.7	1.7	2	0.3	2
Total Selenium (Se)	ug/L	1		ND	ND	--	ND	ND	ND	--	ND	--
Total Silver (Ag)	ug/L	0.1		ND	ND	--	ND	ND	ND	--	ND	--
Total Sodium (Na)	mg/L	0.1		27.8	10.6	0.1	3.8	11.0	107.0	78.7	3.5	111.0
Total Strontium (Sr)	ug/L	5		23	8	--	16	14	83	--	7	--
Total Thallium (Tl)	ug/L	0.1		ND	ND	--	ND	ND	ND	--	ND	--
Total Tin (Sn)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Titanium (Ti)	ug/L	2		4	ND	--	2	2	ND	--	2	--
Total Uranium (U)	ug/L	0.1		1.6	0.2	--	ND	ND	ND	--	0.1	--
Total Vanadium (V)	ug/L	2		ND	ND	--	ND	ND	ND	--	ND	--
Total Zinc (Zn)	ug/L	5		7	ND	ND	ND	ND	ND	ND	10	ND
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		5	2	>250	4	14	6	31	22	16
E. Coli Outlet	MPN/100mL	1		10	1	--	10	--	1	93	38	--
Chlorophyll A - Acidification method	µg/L	N/A		9.83	3.50	0.89	3.94	6.94	5.91	6.72	4.75	4.38
Chlorophyll A - Welschmeyer method	µg/L	N/A		9.09	3.41	0.73	3.67	6.44	5.15	6.00	4.50	4.05

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWJ  
 Morris Lake - sampled by JWJ
- CCME - Canadian Council of Ministers of the Environment  
 Fecal Coliform Guideline: for C  
 Dissolved Oxygen Guideline: for C  
 Bacterial level of concern for surface water  
 Bacterial level unsuitable for swimming

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	LAKE THOMAS NORTH BASIN	LAKE THOMAS SOUTH BASIN	LAKE WILLIAM	LISLE LAKE	LITTLE ALBRO LAKE	LONG LAKE	LONG POND	LOON LAKE	LOVETT LAKE
Community				Waverley	Waverley	Waverley	Upper Sackville	Dartmouth	Mainland South	Herring Cove	Dartmouth	Lakeside
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/08/2011 13:05	10/08/2011 13:30	10/08/2011 14:40	15/08/2011 12:20	15/08/2011 15:20	23/08/2011 8:45	23/08/2011 13:55	08/08/2011 13:10	22/08/2011 12:40
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		3.4	2.7	3.4	1.2	N/A	1.8	0.8	3.9	N/A
Temp	Celsius	N/A		20.57	20.46	20.28	22.18	23.32	21.65	22.08	21.14	23.15
Dissolved Oxygen	mg/L	0.2	6-9.5	8.74	9.00	9.08	11.83	9.28	8.98	7.50	8.83	8.95
pH	pH	N/A	6.5-9.0	6.63	6.72	6.76	7.84	6.88	5.76	6.00	6.06	6.15
Specific Conductance	mS/cm	0.001		0.142	0.175	0.178	0.135	0.365	0.224	0.061	0.287	0.316
TDS	g/L	0.01		0.093	0.114	0.115	0.088	0.238	0.145	0.040	0.187	0.205
Salinity	ppt	0.01		0.07	0.08	0.08	0.06	0.17	0.11	0.03	0.14	0.15
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		8	20	21	10	14	ND	ND	18	9
Dissolved Chloride (Cl)	mg/L	1		31	38	37	26	90	58	11	70	65
Colour	TCU	5		37	33	31	32	27	102	258	ND	38
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		5.2	3.1	2.9	3.2	2.3	1.1	1.5	ND	1.2
Nitrate + Nitrite	mg/L	0.05	13000	0.17	0.08	0.11	ND	ND	ND	ND	ND	0.19
Nitrate (N)	mg/L	0.05		0.17	0.08	0.11	ND	ND	ND	ND	ND	0.19
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		5.7	5.2	5.5	7.1	3.7	11.2	21.3	4.3	7.9
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.3	7.4	7.5	7.6	7.6	6.3	5.9	7.7	7.2
Total Phosphorus (1M depth)	mg/L	0.001		0.011	0.008	0.007	0.078	0.010	0.008	0.015	0.015	0.010
Total Phosphorus Deep (if stratified)	mg/L			N/A	N/A	0.008	N/A	N/A	N/A	0.053	N/A	N/A
Reactive Silica (SiO2)	mg/L	0.5		1.2	1.6	1.5	1.5	1.4	2.6	2.6	1.4	4.8
Total Suspended Solids	mg/L	5		9	ND	ND	7	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		7	7	7	8	9	8	3	9	31
Turbidity	NTU	0.1		1.3	1.2	0.9	2.7	0.8	0.9	0.9	0.8	1.7
Conductivity	uS/cm	1		138	169	171	133	354	222	59	280	303
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		1.19	1.62	1.62	1.10	3.00	1.80	0.37	2.52	2.67
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		8	20	21	10	14	ND	ND	18	9
Calculated TDS	mg/L	1		69	91	93	68	178	111	26	147	167
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.17	1.53	1.61	1.28	3.16	2.01	0.53	2.60	2.99
Hardness (CaCO3)	mg/L	1		16	21	21	20	26	15	7	29	45
Ion Balance (% Difference)	%	N/A		0.8	3.1	0.0	7.7	2.5	5.5	17.4	1.5	5.7
Langelier Index (@ 20C)	N/A	N/A		-2.64	-2.04	-1.91	-2.21	-1.93	-6.63	-7.35	-1.69	-2.29
Langelier Index (@ 4C)	N/A	N/A		-2.96	-2.36	-2.23	-2.53	-2.25	-6.95	-7.67	-2.01	-2.61
Saturation pH (@ 20C)	N/A	N/A		9.94	9.44	9.41	9.81	9.53	12.93	13.25	9.39	9.49
Saturation pH (@ 4C)	N/A	N/A		10.26	9.76	9.73	10.13	9.85	13.25	13.57	9.71	9.81
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		61	43	39	70	13	248	455	19	198
Total Antimony (Sb)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	ug/L	2		3	5	3	ND	2	ND	ND	ND	ND
Total Barium (Ba)	ug/L	5		8	9	9	8	7	9	5	9	24
Total Beryllium (Be)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	ug/L	5		6	7	7	12	9	7	8	11	12
Total Cadmium (Cd)	ug/L	0.017		0.048	0.051	0.049	ND	ND	0.031	0.029	0.039	0.078

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	LAKE THOMAS NORTH BASIN	LAKE THOMAS SOUTH BASIN	LAKE WILLIAM	LISLE LAKE	LITTLE ALBRO LAKE	LONG LAKE	LONG POND	LOON LAKE	LOVETT LAKE
Community				Waverley	Waverley	Waverley	Upper Sackville	Dartmouth	Mainland South	Herring Cove	Dartmouth	Lakeside
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/08/2011 13:05	10/08/2011 13:30	10/08/2011 14:40	15/08/2011 12:20	15/08/2011 15:20	23/08/2011 8:45	23/08/2011 13:55	08/08/2011 13:10	22/08/2011 12:40
Total Calcium (Ca)	mg/L	0.1		5.3	6.9	7.1	5.7	8.7	4.6	1.9	9.2	14.8
Total Chromium (Cr)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Cobalt (Co)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	2
Total Iron (Fe)	ug/L	50		113	96	90	306	118	231	633	96	276
Total Lead (Pb)	ug/L	0.5		ND	ND	ND	ND	ND	ND	1.2	ND	0.5
Total Magnesium (Mg)	mg/L	0.1		0.7	0.9	0.9	1.3	1.0	0.9	0.5	1.4	2.0
Total Manganese (Mn)	ug/L	2		38	27	21	56	69	29	44	165	193
Total Molybdenum (Mo)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	7
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Potassium (K)	mg/L	0.1		0.9	1.2	1.1	1.0	0.8	0.6	0.4	1.2	1.5
Total Selenium (Se)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	0.2	ND	ND	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		18.7	24.5	26.4	19.4	60.0	38.0	8.1	45.5	46.2
Total Strontium (Sr)	ug/L	5		19	28	28	22	40	22	11	34	54
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	ug/L	2		ND	ND	ND	ND	ND	2	5	ND	4
Total Uranium (U)	ug/L	0.1		ND	ND	ND	ND	ND	0.1	0.1	ND	0.8
Total Vanadium (V)	ug/L	2		ND	ND	ND	ND	ND	ND	2	ND	ND
Total Zinc (Zn)	ug/L	5		ND	ND	ND	ND	ND	ND	ND	ND	16
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		14	7	3	84	12	4	13	1	14
E. Coli Outlet	MPN/100mL	1		45	--	33	36	6	6	1553	13	--
Chlorophyll A - Acidification method	µg/L	N/A		2.57	3.92	4.06	56.61	2.90	3.83	1.22	4.04	6.78
Chlorophyll A - Welschmeyer method	µg/L	N/A		2.20	3.39	3.45	49.84	2.46	3.76	1.13	3.54	6.13

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWJ
  - Morris Lake - sampled by JWJ
  - CCME - Canadian Council of Ministers of the Environment  
Fecal Coliform Guideline: for C  
Dissolved Oxygen Guideline: 100%  
Bacterial level of concern for swimming  
Bacterial level unsuitable for swimming

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	MAYNARD LAKE	McCABE LAKE	MCINTOSH RUN at Mouth	MCINTOSH RUN at ROACHES POND	MILL POND (THREE MILE POND)	MILLER LAKE	MOODY LAKE	MORRIS LAKE NORTH BASIN	MORRIS LAKE SOUTH BASIN
Community				Dartmouth	Lucasville	Herring Cove	Spryfield	Timberlea	Fall River	Williamswood	Dartmouth	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			02/08/2011 12:40	19/08/2011 10:55	23/08/2011 14:30	23/08/2011 13:15	22/08/2011 10:30	10/08/2011 8:45	23/08/2011 9:50	04/08/2011 11:30	04/08/2011 12:00
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		6.1	1.6	N/A	N/A	N/A	3.2	0.4	3.2	1.9
Temp	Celsius	N/A		21.50	21.85	23.55	22.98	21.96	20.35	22.00	20.54	20.00
Dissolved Oxygen	mg/L	0.2	6-9.5	8.55	9.28	8.91	8.87	8.16	8.43	7.86	8.69	8.64
pH	pH	N/A	6.5-9.0	7.13	6.42	5.69	6.66	5.53	6.30	5.05	7.18	7.28
Specific Conductance	mS/cm	0.001		0.344	0.056	0.176	0.227	0.068	0.087	0.042	0.323	0.312
TDS	g/L	0.01		0.223	0.037	0.114	0.147	0.044	0.057	0.027	0.210	0.202
Salinity	ppt	0.01		0.16	0.03	0.08	0.11	0.03	0.04	0.02	0.15	0.15
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		21	ND	ND	ND	ND	ND	ND	28	26
Dissolved Chloride (Cl)	mg/L	1		85	11	42	56	14	18	6	73	77
Colour	TCU	5		6	73	126	91	105	51	270	ND	12
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	1.8	1.4	1.2	1.7	2.5	1.6	0.5	1.8
Nitrate + Nitrite	mg/L	0.05	13000	ND	ND	ND	0.13	0.10	0.23	ND	0.09	ND
Nitrate (N)	mg/L	0.05		ND	ND	ND	0.13	0.10	0.23	ND	0.09	ND
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		3.8	10.8	13.2	10.8	13.2	7.4	22.8	4.5	4.0
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.8	6.7	6.5	6.6	6.3	6.8	5.4	7.8	7.8
Total Phosphorus (1M depth)	mg/L	0.001		0.008	0.006	0.017	0.014	0.015	0.012	0.023	0.043	0.023
Total Phosphorus Deep (if stratified)	mg/L			0.020	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Reactive Silica (SiO2)	mg/L	0.5		0.7	1.2	2.5	2.8	2.1	ND	1.9	1.4	1.0
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		11	3	6	8	3	5	4	11	11
Turbidity	NTU	0.1		0.7	1.0	1.2	1.9	0.9	1.0	1.8	2.9	1.3
Conductivity	uS/cm	1		329	54	171	220	65	85	41	303	317
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		3.04	0.37	1.31	1.75	0.46	0.63	0.25	2.85	2.92
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		21	ND	ND	ND	ND	ND	ND	28	26
Calculated TDS	mg/L	1		192	29	83	112	30	41	18	164	172
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		3.76	0.64	1.58	2.12	0.60	0.77	0.40	2.85	3.07
Hardness (CaCO3)	mg/L	1		32	8	14	16	8	9	6	40	39
Ion Balance (% Difference)	%	N/A		10.5	26.7	9.4	9.4	12.7	10.1	23.1	0.1	2.5
Langelier Index (@ 20C)	N/A	N/A		-1.52	-6.49	-6.47	-6.30	-6.91	-6.29	-7.88	-1.23	-1.28
Langelier Index (@ 4C)	N/A	N/A		-1.84	-6.81	-6.79	-6.62	-7.23	-6.61	-8.20	-1.55	-1.60
Saturation pH (@ 20C)	N/A	N/A		9.32	13.19	12.97	12.90	13.21	13.09	13.28	9.03	9.08
Saturation pH (@ 4C)	N/A	N/A		9.64	13.51	13.29	13.22	13.53	13.41	13.60	9.35	9.40
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		15	182	278	233	265	97	503	77	26
Total Antimony (Sb)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Barium (Ba)	ug/L	5		17	5	8	11	10	ND	ND	14	12
Total Beryllium (Be)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	ug/L	5		8	9	9	8	8	ND	14	11	11
Total Cadmium (Cd)	ug/L	0.017		0.037	0.203	0.018	0.022	0.025	0.042	0.025	0.037	0.038

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	MAYNARD LAKE	McCABE LAKE	MCINTOSH RUN at Mouth	MCINTOSH RUN at ROACHES POND	MILL POND (THREE MILE POND)	MILLER LAKE	MOODY LAKE	MORRIS LAKE NORTH BASIN	MORRIS LAKE SOUTH BASIN
Community				Dartmouth	Lucasville	Herring Cove	Spryfield	Timberlea	Fall River	Williamswood	Dartmouth	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			02/08/2011 12:40	19/08/2011 10:55	23/08/2011 14:30	23/08/2011 13:15	22/08/2011 10:30	10/08/2011 8:45	23/08/2011 9:50	04/08/2011 11:30	04/08/2011 12:00
Total Calcium (Ca)	mg/L	0.1		9.3	2.2	4.1	4.9	2.1	2.9	1.7	13.5	13.1
Total Chromium (Cr)	ug/L	1		ND	830	ND	ND	ND	ND	ND	ND	ND
Total Cobalt (Co)	ug/L	1		ND	7	ND	ND	ND	ND	ND	ND	ND
Total Copper (Cu)	ug/L	2		ND	19	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		94	3520	453	358	296	180	640	169	84
Total Lead (Pb)	ug/L	0.5		ND	5.1	0.7	ND	ND	ND	1.4	ND	ND
Total Magnesium (Mg)	mg/L	0.1		2.0	0.6	0.8	0.9	0.6	0.5	0.5	1.4	1.4
Total Manganese (Mn)	ug/L	2		72	91	30	54	40	42	49	81	46
Total Molybdenum (Mo)	ug/L	2		ND	83.00	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	561	ND	ND	ND	2	ND	ND	ND
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Potassium (K)	mg/L	0.1		1.1	0.5	0.6	0.7	0.6	0.6	0.4	1.3	1.4
Total Selenium (Se)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		71.1	7.3	28.6	40.0	8.9	12.6	4.2	46.1	51.8
Total Strontium (Sr)	ug/L	5		42	12	21	26	12	9	9	41	40
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	ug/L	2		ND	ND	2	2	ND	ND	7	3	ND
Total Uranium (U)	ug/L	0.1		ND	ND	0.3	0.2	0.2	ND	0.3	ND	ND
Total Vanadium (V)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Zinc (Zn)	ug/L	5		ND	106	ND	ND	ND	ND	ND	ND	ND
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		7	ND	107	126	57	5	1	219	15
E. Coli Outlet	MPN/100mL	1		--	ND	--	--	10	4	<1	--	91
Chlorophyll A - Acidification method	µg/L	N/A		1.99	9.56	12.44	3.87	3.13	2.73	1.43	13.28	7.56
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.71	8.66	11.25	3.69	3.13	2.40	1.36	12.47	7.03

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWJ  
 Morris Lake - sampled by JWJ
- CCME - Canadian Council of Ministers of the Environment  
 Fecal Coliform Guideline: for C  
 Dissolved Oxygen Guideline: 100%  
 Bacterial level of concern for surface water  
 Bacterial level unsuitable for swimming

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	NINE MILE RIVER AT HWY 103	NINE MILE RIVER AT MOUTH	OATHILL LAKE	PAPER MILL LAKE <sup>2</sup>	PENHORN LAKE	PORTERS LAKE, UPPER	POWDER MILL LAKE	PUNCH BOWL (DENT'S)	RED BRIDGE POND
Community				Timberlea	Shad Bay	Dartmouth	Bedford	Dartmouth	Porters Lake	Waverley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			22/08/2011 8:30	22/08/2011 13:15	02/08/2011 10:00	14/08/2011 16:20	07/08/2011 11:40	08/08/2011 10:10	12/08/2011 8:50	23/08/2011 12:20	05/08/2011 10:55
<b>FIELD DATA</b>					Sampled 1.5h before high tide							
Secchi Depth	Meters	N/A		N/A	N/A	4.9	2.3	4.4	1.5	3.2	N/A	1.4
Temp	Celsius	N/A		22.69	23.24	21.73	23.10	21.99	20.67	20.20	22.60	18.75
Dissolved Oxygen	mg/L	0.2	6-9.5	7.70	9.22	8.26	8.7	8.75	8.64	9.07	9.54	4.54
pH	pH	N/A	6.5-9.0	6.34	6.05	7.60	6.67	7.40	7.00	6.85	6.22	7.10
Specific Conductance	mS/cm	0.001		0.115	0.667	0.414	0.173	0.531	0.714	0.203	0.539	0.262
TDS	g/L	0.01		0.075	0.434	0.269	--	0.345	0.461	0.132	0.350	0.170
Salinity	ppt	0.01		0.05	0.32	0.20	--	0.26	0.35	0.10	0.26	0.12
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		ND	ND	36	8	35	ND	22	52	32
Dissolved Chloride (Cl)	mg/L	1		23	180	95	43	134	199	41	118	54
Colour	TCU	5		102	147	8	38	ND	97	27	14	29
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		2.1	1.8	0.6	--	ND	ND	4.6	1.6	0.8
Nitrate + Nitrite	mg/L	0.05	13000	0.79	ND	0.13	0.14	ND	ND	ND	ND	0.25
Nitrate (N)	mg/L	0.05		0.79	ND	0.13	--	ND	ND	ND	ND	0.25
Nitrite (N)	mg/L	0.05		ND	ND	ND	--	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.23	ND	0.10	ND	ND	ND	ND	ND	0.31
Total Organic Carbon (C)	mg/L	0.5		12.5	14.2	5.3	6.0	3.9	10.8	4.6	8.0	5.1
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	0.01
pH (Lab)	pH	N/A	6.5-9.0	6.8	6.2	7.9	6.60	8.0	5.9	7.7	8.1	7.6
Total Phosphorus (1M depth)	mg/L	0.001		0.064	0.022	0.023	0.009	0.009	0.017	0.011	0.015	0.061
Total Phosphorus Deep (if stratified)	mg/L			N/A	N/A	0.021	N/A	0.012	N/A	0.015	N/A	N/A
Reactive Silica (SiO2)	mg/L	0.5		2.4	3.0	2.5	2.5	0.7	2.3	1.1	1.1	2.4
Total Suspended Solids	mg/L	5		ND	ND	ND	8	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		6	26	13	10	13	27	8	15	10
Turbidity	NTU	0.1		1.2	0.9	0.7	3.4	0.9	1.0	0.9	1.7	5.6
Conductivity	uS/cm	1		108	642	392	170	505	679	196	526	253
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		0.83	5.61	3.68	1.58	4.75	6.17	1.76	4.68	2.39
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	36	8	35	ND	22	52	32
Calculated TDS	mg/L	1		56	346	233	89	301	358	99	273	148
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.06	6.57	4.65	1.28	5.93	6.22	1.68	4.91	2.85
Hardness (CaCO3)	mg/L	1		13	66	50	15	48	63	29	63	35
Ion Balance (% Difference)	%	N/A		12.1	7.9	11.7	10.50	11.1	0.4	2.3	2.4	8.8
Langelier Index (@ 20C)	N/A	N/A		-6.41	-6.72	-0.99	-3.18	-0.89	-8.08	-1.57	-0.46	-1.42
Langelier Index (@ 4C)	N/A	N/A		-6.46	-7.04	-1.31	-3.43	-1.21	-8.40	-1.89	-0.78	-1.74
Saturation pH (@ 20C)	N/A	N/A		12.94	12.92	8.89	9.78	8.89	13.98	9.27	8.56	9.02
Saturation pH (@ 4C)	N/A	N/A		13.26	13.24	9.21	10.00	9.21	14.30	9.59	8.88	9.34
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		286	315	23	--	17	255	23	31	--
Total Antimony (Sb)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Arsenic (As)	ug/L	2		ND	ND	ND	--	ND	ND	4	3	--
Total Barium (Ba)	ug/L	5		12	8	35	--	29	6	15	33	--
Total Beryllium (Be)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Boron (B)	ug/L	5		14	51	12	--	8	54	20	28	--
Total Cadmium (Cd)	ug/L	0.017		0.025	0.023	0.040	--	0.051	0.059	0.054	0.023	--

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	NINE MILE RIVER AT HWY 103	NINE MILE RIVER AT MOUTH	OATHILL LAKE	PAPER MILL LAKE <sup>2</sup>	PENHORN LAKE	PORTERS LAKE, UPPER	POWDER MILL LAKE	PUNCH BOWL (DENT'S)	RED BRIDGE POND
Community				Timberlea	Shad Bay	Dartmouth	Bedford	Dartmouth	Porters Lake	Waverley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			22/08/2011 8:30	22/08/2011 13:15	02/08/2011 10:00	14/08/2011 16:20	07/08/2011 11:40	08/08/2011 10:10	12/08/2011 8:50	23/08/2011 12:20	05/08/2011 10:55
Total Calcium (Ca)	mg/L	0.1		4.2	5.3	15.2		15.8	4.6	9.5	22.6	12.0
Total Chromium (Cr)	ug/L	1		ND	ND	ND	--	ND	ND	ND	ND	--
Total Cobalt (Co)	ug/L	1		ND	ND	ND	--	ND	ND	ND	ND	--
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		289	308	74	699	59	238	108	331	--
Total Lead (Pb)	ug/L	0.5		0.6	0.6	ND	--	ND	ND	ND	ND	1290.0
Total Magnesium (Mg)	mg/L	0.1		0.7	12.9	2.9	--	2.1	12.4	1.3	1.6	1.1
Total Manganese (Mn)	ug/L	2		40	23	155	89	67	33	54	68	210
Total Molybdenum (Mo)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Nickel (Ni)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	--	ND	ND	ND	ND	--
Total Potassium (K)	mg/L	0.1		1.0	3.9	2	0.801	1.7	3.6	1.5	2.0	1
Total Selenium (Se)	ug/L	1		ND	3	ND	--	ND	3	ND	ND	--
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	--	ND	ND	ND	ND	--
Total Sodium (Na)	mg/L	0.1		16.2	117.0	82.6	21.3	113.0	111.0	24.2	82.3	46.9
Total Strontium (Sr)	ug/L	5		17	76	56	--	59	81	35	97	--
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	--	ND	ND	ND	ND	--
Total Tin (Sn)	ug/L	2		ND	ND	ND	--	ND	ND	ND	ND	--
Total Titanium (Ti)	ug/L	2		ND	3	ND	--	ND	3	ND	ND	--
Total Uranium (U)	ug/L	0.1		0.3	0.4	ND	--	ND	ND	ND	ND	--
Total Vanadium (V)	ug/L	2		ND	ND	ND	--	ND	ND	ND	5	--
Total Zinc (Zn)	ug/L	5		5	6	ND	8	ND	ND	ND	7	ND
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		27	14	6	>250	10	13	3	15	21
E. Coli Outlet	MPN/100mL	1		--	--	20	>250	17	--	3	--	34
Chlorophyll A - Acidification method	µg/L	N/A		1.72	5.61	3.60	2.48	3.83	2.36	6.89	32.52	7.83
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.71	5.54	3.44	2.26	3.64	2.11	6.19	28.78	7.25

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWL
  - Morris Lake - sampled by JWL
  - CCME - Canadian Council of Ministers of the Environment
  - Fecal Coliform Guideline: for Class 1
  - Dissolved Oxygen Guideline: for Class 1
  - Bacterial level of concern for Class 1
  - Bacterial level unsuitable for swimming

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	ROCKY LAKE	RUSSELL LAKE	SACKVILLE RIVER @ HWY 102	SACKVILLE RIVER @ MOUTH	SANDY LAKE BEDFORD*	SANDY LAKE GLEN ARBOUR	SECOND LAKE*	SETTLE LAKE	SHELDRAKE LAKE
Community				Bedford	Dartmouth	Bedford	Bedford	Bedford	Glen Arbour	Middle Sackville	Dartmouth	Hubley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			12/08/2011 9:55	10/08/2011	18/08/2011 11:50	18/08/2011 12:15	19/08/2011 9:10	19/08/2011 12:45	11/08/2011 11:10	04/08/2011 13:05	24/08/2011 10:20
<b>FIELD DATA</b>												
Secchi Depth	Meters	N/A		1.7	1.5	N/A	N/A	1.5	2.8	N/A	1.1	0.9
Temp	Celsius	N/A		19.60	20.7	21.85	20.93	22.67	22.71	20.46	19.87	21.08
Dissolved Oxygen	mg/L	0.2	6-9.5	8.05	5.9	9.67	10.01	9.27	8.89	9.08	8.99	7.62
pH	pH	N/A	6.5-9.0	6.78	8.2	6.83	7.58	6.80	6.17	6.81	7.24	5.19
Specific Conductance	mS/cm	0.001		0.302	0.526	0.089	1.034	0.119	0.048	0.133	0.359	0.099
TDS	g/L	0.01		0.196	--	0.058	0.672	0.077	0.031	0.086	0.233	0.064
Salinity	ppt	0.01		0.14	--	0.04	0.51	0.06	0.02	0.06	0.17	0.05
<b>INORGANICS</b>												
Total Alkalinity (Total as CaCO3)	mg/L	5		39	33	9	21	6	5	12	32	ND
Dissolved Chloride (Cl)	mg/L	1		56	130	18	349	24	7	28	84	24
Colour	TCU	5		28	22	46	39	71	8	34	16	181
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		2.4	--	1.3	1.4	3.6	1.3	2.3	0.6	1.4
Nitrate + Nitrite	mg/L	0.05	13000	0.11	ND	ND	ND	ND	ND	ND	ND	0.05
Nitrate (N)	mg/L	0.05		0.11	--	ND	ND	ND	ND	ND	ND	0.05
Nitrite (N)	mg/L	0.05		ND	--	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.08	0.12	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		5.3	4.2	9.6	9.6	10.4	5.0	6.5	7.3	15.5
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.9	6.8	7.2	7.3	7.1	7.1	7.5	7.8	6.0
Total Phosphorus (1M depth)	mg/L	0.001		0.015	0.019	0.008	0.010	0.006	0.005	0.008	0.045	0.033
Total Phosphorus Deep (if stratified)	mg/L			0.019	N/A	N/A	N/A	0.005	N/A	N/A	0.020	0.142
Reactive Silica (SiO2)	mg/L	0.5		2.2	2	1.6	1.6	2.2	0.7	0.5	0.8	4.0
Total Suspended Solids	mg/L	5		ND	3	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		12	16	5	50	5	3	4	10	4
Turbidity	NTU	0.1		2.3	2.2	1.1	1.1	1.8	0.7	1.8	5.5	1.9
Conductivity	uS/cm	1		291	540	85	1220	113	44	126	350	99
<b>Calculated Parameters</b>												
Anion Sum	me/L	N/A		2.62	--	0.79	11.29	0.90	0.36	1.11	3.21	0.76
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		39	33	9	21	6	5	12	32	ND
Calculated TDS	mg/L	1		151	279	44	623	56	22	19	186	48
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.69	--	0.71	9.93	1.07	0.42	1.20	3.32	0.89
Hardness (CaCO3)	mg/L	1		53	53	12	109	12	10	19	46	8
Ion Balance (% Difference)	%	N/A		1.4	--	5.4	6.4	8.6	8.2	3.7	1.7	7.6
Langelier Index (@ 20C)	N/A	N/A		-0.84	--	-2.84	-2.11	-3.10	-3.31	-2.21	-1.13	-7.25
Langelier Index (@ 4C)	N/A	N/A		-1.16	--	-3.16	-2.43	-3.42	-3.63	-2.53	-1.45	-7.57
Saturation pH (@ 20C)	N/A	N/A		8.74	--	10.04	9.31	10.20	10.41	9.71	8.93	13.25
Saturation pH (@ 4C)	N/A	N/A		9.06	--	10.36	9.63	10.52	10.73	10.03	9.25	13.57
<b>Metals (ICP-MS)</b>												
Total Aluminum (Al)	ug/L	5		18	--	122	127	171	23	85	142	344
Total Antimony (Sb)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	3
Total Barium (Ba)	ug/L	5		19	--	8	10	14	ND	11	19	13
Total Beryllium (Be)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	ug/L	5		14	--	9	80	8	7	8	12	10
Total Cadmium (Cd)	ug/L	0.017		0.044	--	ND	0.017	0.031	ND	0.063	0.041	0.044

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	ROCKY LAKE	RUSSELL LAKE	SACKVILLE RIVER @ HWY 102	SACKVILLE RIVER @ MOUTH	SANDY LAKE BEDFORD*	SANDY LAKE GLEN ARBOUR	SECOND LAKE*	SETTLE LAKE	SHELDRAKE LAKE
Community				Bedford	Dartmouth	Bedford	Bedford	Bedford	Glen Arbour	Middle Sackville	Dartmouth	Hubley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			12/08/2011 9:55	10/08/2011	18/08/2011 11:50	18/08/2011 12:15	19/08/2011 9:10	19/08/2011 12:45	11/08/2011 11:10	04/08/2011 13:05	24/08/2011 10:20
Total Calcium (Ca)	mg/L	0.1		18.6	18.0	3.6	10.8	3.8	2.6	6.0	15.1	2.0
Total Chromium (Cr)	ug/L	1		ND	--	1	1	1	3	ND	ND	ND
Total Cobalt (Co)	ug/L	1		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Copper (Cu)	ug/L	2		ND	--	ND	ND	ND	ND	ND	2	ND
Total Iron (Fe)	ug/L	50		100	--	310	371	343	75	168	426	813
Total Lead (Pb)	ug/L	0.5		ND	--	ND	ND	ND	ND	ND	ND	1.0
Total Magnesium (Mg)	mg/L	0.1		1.6	2.0	0.7	20.0	0.7	0.8	0.9	1.9	0.6
Total Manganese (Mn)	ug/L	2		181	--	48	51	53	48	55	292	75
Total Molybdenum (Mo)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	--	ND	2	2	2	ND	ND	ND
Total Phosphorous (P)	mg/L	0.1		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Potassium (K)	mg/L	0.1		3.4	2	0.6	6.6	0.7	0.8	0.9	1.5	0.6
Total Selenium (Se)	ug/L	1		ND	--	ND	2	ND	ND	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		35.1	85.0	9.9	173.0	18.1	4.6	18.0	53.6	15.0
Total Strontium (Sr)	ug/L	5		61	--	16	138	18	12	20	40	13
Total Thallium (Tl)	ug/L	0.1		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	ug/L	2		ND	--	ND	2	2	ND	3	4	2
Total Uranium (U)	ug/L	0.1		0.1	--	ND	ND	ND	ND	ND	ND	0.5
Total Vanadium (V)	ug/L	2		ND	--	ND	ND	ND	ND	ND	ND	ND
Total Zinc (Zn)	ug/L	5		ND	--	ND	9	5	ND	ND	ND	ND
<b>MICROBIOLOGICAL</b>												
E. Coli Lake	MPN/100mL	1		2	67	30	32	4	ND	5	186	9
E. Coli Outlet	MPN/100mL	1		--	--	--	--	3	2	17	166	6
Chlorophyll A - Acidification method	µg/L	N/A		9.94	8	2.13	1.99	8.33	3.39	2.50	57.14	13.44
Chlorophyll A - Welschmeyer method	µg/L	N/A		9.16	--	2.04	1.91	7.59	3.32	2.27	53.11	12.75

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWL
  - Morris Lake - sampled by JWL
  - CCME - Canadian Council of Ministers of the Environment  
Fecal Coliform Guideline: for C  
Dissolved Oxygen Guideline: 100%  
Bacterial level of concern for surface water  
Bacterial level unsuitable for swimming

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level†	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE	THIRD LAKE	TUCKER LAKE	WHIMSICAL LAKE*	WHYNDER (WINDER) LAKE	WILLIAMS LAKE*
Community				Dartmouth	Middle Sackville	Upper Tantallon	Windsor Junction	Beaverbank	Mainland South	North Preston	Halifax
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			04/08/2011 8:25	18/08/2011 13:35	22/08/2011 9:20	11/08/2011 10:05	12/08/2011 12:30	25/08/2011 9:35	18/08/2011 10:05	24/08/2011 13:55
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		N/A	N/A	1.9	2.7	3.1	1.3	0.8	2.9
Temp	Celsius	N/A		14.83	22.66	22.57	20.15	20.28	21.85	21.60	22.88
Dissolved Oxygen	mg/L	0.2	6-9.5	6.60	8.81	8.87	9.02	9.50	9.63	6.21	8.82
pH	pH	N/A	6.5-9.0	6.59	6.97	6.02	6.67	7.12	6.72	6.78	6.38
Specific Conductance	mS/cm	0.001		0.113	0.105	0.490	0.133	0.204	0.306	0.191	0.196
TDS	g/L	0.01		0.073	0.068	0.032	0.086	0.133	0.199	0.124	0.127
Salinity	ppt	0.01		0.05	0.05	0.02	0.06	0.10	0.15	0.09	0.09
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO3)	mg/L	5		21	17	ND	15	ND	31	39	6
Dissolved Chloride (Cl)	mg/L	1		20	20	10	27	43	62	28	48
Colour	TCU	5		218	12	78	31	31	11	27	30
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		2.3	1.2	1.2	2.1	2.6	1.4	3.6	1.2
Nitrate + Nitrite	mg/L	0.05	13000	0.05	ND	ND	0.07	ND	0.44	ND	0.05
Nitrate (N)	mg/L	0.05		0.05	ND	ND	0.07	ND	0.44	ND	0.05
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		25.9	4.8	10.2	5.6	5.6	6.1	10.2	6.1
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.0	7.5	6.1	7.6	7.8	8.0	7.7	7.0
Total Phosphorus (1M depth)	mg/L	0.001		0.023	0.004	0.011	0.007	0.009	0.016	0.128	0.008
Total Phosphorus Deep (if stratified)	mg/L			N/A	N/A	0.013	0.005	0.008	N/A	N/A	0.011
Reactive Silica (SiO2)	mg/L	0.5		3.6	0.9	1.5	0.8	0.9	3.6	2.9	1.4
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	15	ND
Dissolved Sulphate (SO4)	mg/L	2		7	8	3	5	8	26	14	12
Turbidity	NTU	0.1		1.8	0.5	0.6	1.6	1.3	2.6	9.9	0.8
Conductivity	uS/cm	1		108	100	46	125	ND	305	186	196
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		1.13	1.07	0.34	1.17	1.82	2.94	1.86	1.73
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		21	17	ND	15	22	31	39	6
Calculated TDS	mg/L	1		62	56	22	68	104	177	104	104
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.05	0.80	0.43	1.23	1.82	3.12	1.73	1.82
Hardness (CaCO3)	mg/L	1		19	13	6	19	31	46	22	16
Ion Balance (% Difference)	%	N/A		3.9	14.6	10.5	2.5	0.0	2.9	3.6	2.5
Langelier Index (@ 20C)	N/A	N/A		-2.45	-2.13	-7.28	-2.01	-1.46	-0.93	-1.45	-3.11
Langelier Index (@ 4C)	N/A	N/A		-2.77	-2.45	-7.60	-2.33	-1.78	-1.25	-1.77	-3.43
Saturation pH (@ 20C)	N/A	N/A		9.45	9.63	13.38	9.61	9.26	8.93	9.15	10.11
Saturation pH (@ 4C)	N/A	N/A		9.77	9.95	13.70	9.93	9.58	9.25	9.47	10.43
<b>Metals (ICP-MS)</b>											
Total Aluminum (Al)	ug/L	5		317	21	250	25	41	30	53	105
Total Antimony (Sb)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Arsenic (As)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Barium (Ba)	ug/L	5		10	6	6	12	16	15	14	9
Total Beryllium (Be)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Bismuth (Bi)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Boron (B)	ug/L	5		15	9	7	10	11	20	48	10
Total Cadmium (Cd)	ug/L	0.017		0.055	ND	0.020	0.041	0.034	ND	ND	ND

HRM Water Quality Monitoring Program Results - Summer 2011

Summer 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE	THIRD LAKE	TUCKER LAKE	WHIMSICAL LAKE*	WHYNDER (WINDER) LAKE	WILLIAMS LAKE*
Community				Dartmouth	Middle Sackville	Upper Tantallon	Windsor Junction	Beaverbank	Mainland South	North Preston	Halifax
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			04/08/2011 8:25	18/08/2011 13:35	22/08/2011 9:20	11/08/2011 10:05	12/08/2011 12:30	25/08/2011 9:35	18/08/2011 10:05	24/08/2011 13:55
Total Calcium (Ca)	mg/L	0.1		6.2	5.0	1.4	6.1	9.7	15.4	7.0	5.0
Total Chromium (Cr)	ug/L	1		ND	1	ND	ND	ND	ND	1	ND
Total Cobalt (Co)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Total Copper (Cu)	ug/L	2		2	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		466	92	214	72	85	78	236	150
Total Lead (Pb)	ug/L	0.5		0.5	ND	ND	ND	ND	ND	ND	ND
Total Magnesium (Mg)	mg/L	0.1		0.9	1.0	0.5	1.0	1.6	1.8	1.0	0.9
Total Manganese (Mn)	ug/L	2		31	40	45	27	17	129	133	21
Total Molybdenum (Mo)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Nickel (Ni)	ug/L	2		ND	ND	ND	ND	ND	4	ND	ND
Total Phosphorous (P)	mg/L	0.1		ND	ND	ND	ND	ND	ND	0.2	ND
Total Potassium (K)	mg/L	0.1		0.5	0.9	0.4	0.9	1.3	1.5	2.5	0.8
Total Selenium (Se)	ug/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Total Silver (Ag)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND
Total Sodium (Na)	mg/L	0.1		13.7	11.9	6.1	18.7	26.6	49.4	27.9	33.2
Total Strontium (Sr)	ug/L	5		25	20	9	21	30	55	29	27
Total Thallium (Tl)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND
Total Tin (Sn)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Titanium (Ti)	ug/L	2		4	ND	ND	ND	ND	ND	ND	ND
Total Uranium (U)	ug/L	0.1		ND	ND	ND	ND	ND	ND	ND	ND
Total Vanadium (V)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Zinc (Zn)	ug/L	5		10	ND	ND	ND	ND	ND	5	6
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		1046	3	5	9	5	6	2	6
E. Coli Outlet	MPN/100mL	1		96	2	8	5	6	5	ND	2
Chlorophyll A - Acidification method	µg/L	N/A		0.74	1.13	2.53	9.56	6.49	16.33	118.89	3.97
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.72	0.94	2.31	8.63	5.73	14.44	92.19	3.58

**Notes:**

- Not Analysed
  - ND Not Detected
  - N/A Not Applicable
  - MPN Most Probable Number
  - RDL Reportable Detection Limit
  - ug Micrograms
  - mg Milligrams
  - L Litre
  - <sup>†</sup> Recreational Water Quality Guidelines
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
  - <sup>3</sup> 'Lake' = @ mouth; 'Outlet' = Hwy 102;
- Russell Lake - sampled by JWL  
Morris Lake - sampled by JWL
- CCME - Canadian Council of Ministers of the Environment  
Fecal Coliform Guideline: for C  
Dissolved Oxygen Guideline: 100%  
Bacterial level of concern for surface water  
Bacterial level unsuitable for swimming