

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	ALBRO LAKE	BARRETT LAKE	BELL LAKE	BISSETT LAKE	BLACK DUCK POND	CHOCOLATE LAKE	CRANBERRY LAKE
Community				Dartmouth	Beaverbank	Dartmouth	Cole Harbour	Lakeside	Halifax	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/11/2011 13:20	15/11/2011 10:45	14/11/2011 9:10	18/10/2011 13:10	15/11/2011 13:15	17/11/2011 13:50	18/10/2011 14:20
<b>FIELD DATA</b>										
Secchi Depth	Meters	N/A		3.6	2.1	N/A	1.3	N/A	3.5	N/A
Temp	Celsius	N/A		9.68	8.95	8.69	14.40	9.82	9.81	14.29
Dissolved Oxygen	mg/L	0.2	6-9.5	11.64	10.53	10.82	10.21	10.34	11.79	9.23
pH	pH	N/A	6.5-9.0	7.27	7.19	7.27	7.78	6.35	6.23	7.62
Specific Conductance	mS/cm	0.001		0.309	0.154	0.052	0.309	0.197	0.328	0.224
TDS	g/L	0.001		0.201	0.100	0.034	0.201	0.128	0.213	0.146
Salinity	ppt	0.01		0.15	0.07	0.02	0.15	0.09	0.16	0.11
<b>INORGANICS</b>										
Total Alkalinity (Total as CaCO3)	mg/L	5		18	14	ND	33	ND	ND	28
Dissolved Chloride (Cl)	mg/L	1	120	77	32	10	66	33	77	44
Colour	TCU	5		20	38	12	28	71	ND	27
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	ND	0.4	4.7	ND	1.3	4.1
Nitrate + Nitrite	mg/L	0.05	13000	0.08	0.07	ND	0.14	0.15	0.23	0.26
Nitrate (N)	mg/L	0.05		0.08	0.07	ND	0.14	0.15	0.23	0.26
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.12	ND	0.31	ND	ND	0.07	ND
Total Organic Carbon (C)	mg/L	0.5		3.9	6.4	4.8	6.4	11.1	0.9	5.3
Orthophosphate (P)	mg/L	0.01		ND	0.06	ND	ND	0.03	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.4	7.4	6.6	7.9	6.4	6.4	7.8
Total Phosphorus (1M depth)	mg/L	0.001		0.012	0.013	0.010	0.025	0.015	0.010	0.050
Reactive Silica (SiO2)	mg/L	0.5		2.3	2.7	2.0	2.5	5.5	4.5	4.2
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	5.00	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		7.00	6.00	4.00	9.00	28.00	28.00	8.00
Turbidity	NTU	0.1		0.8	2.3	1.2	3.6	6.6	1.2	1.7
Conductivity	uS/cm	1		313	155	49	305	197	330	222
<b>Calculated Parameters</b>										
Anion Sum	me/L	N/A		2.68	1.31	0.37	2.72	1.52	2.77	1.98
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		18	14	ND	33	ND	ND	28
Calculated TDS	mg/L	1		154	78	24	160	99	165	114
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.63	1.41	0.50	2.90	1.77	2.62	2.04
Hardness (CaCO3)	mg/L	1		22	21	9	37	33	24	34
Ion Balance (% Difference)	%	N/A		1.00	3.80	16.00	3.30	7.40	2.70	1.40
Langelier Index (@ 20C)	N/A	N/A		-2.08	-2.22	-6.60	-1.10	-6.20	-6.33	-1.31
Langelier Index (@ 4C)	N/A	N/A		-2.40	-2.54	-6.92	-1.42	-6.52	-6.65	-1.63
Saturation pH (@ 20C)	N/A	N/A		9.48	9.62	13.20	9.00	12.60	12.73	9.11
Saturation pH (@ 4C)	N/A	N/A		9.80	9.94	13.52	9.32	12.92	13.05	9.43
<b>Metals (ICP-MS)</b>										
Total Calcium (Ca)	mg/L	0.1		7.5	6.4	2.1	12.2	9.6	7.6	10.8

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	ALBRO LAKE	BARRETT LAKE	BELL LAKE	BISSETT LAKE	BLACK DUCK POND	CHOCOLATE LAKE	CRANBERRY LAKE
Community				Dartmouth	Beaverbank	Dartmouth	Cole Harbour	Lakeside	Halifax	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/11/2011 13:20	15/11/2011 10:45	14/11/2011 9:10	18/10/2011 13:10	15/11/2011 13:15	17/11/2011 13:50	18/10/2011 14:20
Total Copper (Cu)	ug/L	2		ND	ND	ND	2	2	ND	ND
Total Iron (Fe)	ug/L	50		182	263	88	175	517	133	142
Total Magnesium (Mg)	mg/L	0.1		0.8	1.2	1.0	1.6	2.1	1.2	1.6
Total Manganese (Mn)	ug/L	2		52	64	20	56	112	102	46
Total Potassium (K)	mg/L	0.1		0.8	1.1	0.7	1.6	1.5	0.9	1.1
Total Sodium (Na)	mg/L	0.1		49.3	21.6	6.0	48.4	22.3	48.4	30.5
Total Zinc (Zn)	ug/L	5		ND	5	ND	ND	22	14	ND
<b>MICROBIOLOGICAL</b>										
E. Coli Lake	MPN/100mL	1		24	36	15	9	15	ND	4
E. Coli Outlet	MPN/100mL	1		9	31	10	4	--	1	8
Chlorophyll A - Acidification method	µg/L	N/A		1.22	2.57	2.74	27.60	11.22	1.62	4.10
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.94	2.23	2.54	24.72	9.63	1.23	3.66

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality Guidelines & Guidelines for Protection of Aquatic Life
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life stage

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	DE SAID LAKE	DRAIN LAKE	DUCK LAKE	FENERTY LAKE	FIRST CHAIN LAKE	FIRST LAKE	FLETCHERS LAKE
Community				Dartmouth	Middle Sackville	Beaverbank	Beaverbank	Halifax	Lower Sackville	Fall River
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/08/2011 8:50	29/11/2011 10:05	16/11/2011 12:00	22/11/2011 14:40	17/11/2011 14:25	23/11/2011 10:25	09/11/2011 14:20
<b>FIELD DATA</b>										
Secchi Depth	Meters	N/A		N/A	N/A	0.6	1.0	N/A	2.6	2.9
Temp	Celsius	N/A		N/A	4.89	9.95	7.14	9.71	8.11	8.87
Dissolved Oxygen	mg/L	0.2	6-9.5	N/A	11.53	10.52	10.96	11.82	11.89	10.71
pH	pH	N/A	6.5-9.0	N/A	7.00	7.15	6.34	5.00	7.36	7.08
Specific Conductance	mS/cm	0.001		N/A	0.138	0.116	0.055	0.274	0.388	0.136
TDS	g/L	0.001		N/A	0.090	0.081	0.038	0.178	0.252	0.088
Salinity	ppt	0.01		N/A	0.07	0.05	0.03	0.13	0.19	0.06
<b>INORGANICS</b>										
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		22	7	22	ND	ND	29	17
Dissolved Chloride (Cl)	mg/L	1	120	14	27	18	10	68	89	28
Colour	TCU	5		22	54	64	76	ND	17	47
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		2.8	1.3	0.5	2.6	ND	1.0	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.06	0.15	ND	0.09	0.07	0.09	0.13
Nitrate (N)	mg/L	0.05		0.06	0.15	ND	0.09	0.07	0.09	0.13
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.08	0.23	0.10	0.17	0.07	0.21	0.08
Total Organic Carbon (C)	mg/L	0.5		5.5	8.0	8.7	10.9	1.6	4.2	7.8
Orthophosphate (P)	mg/L	0.01		ND	ND	0.05	0.01	0.01	0.04	ND
pH (Lab)	pH	N/A	6.5-9.0	7.6	6.9	7.5	6.4	5.2	7.8	7.3
Total Phosphorus (1M depth)	mg/L	0.001		0.010	0.033	0.039	0.020	0.007	0.011	ND
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		5.7	2.0	2.5	3.2	2.8	1.8	2.6
Total Suspended Solids	mg/L	5		ND	ND	8.00	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		4.00	10.00	5.00	4.00	14.00	12.00	6.00
Turbidity	NTU	0.1		1.1	4.4	10.1	3.8	0.6	2.3	0.9
Conductivity	uS/cm	1		96	125	116	55	272	386	133
<b>Calculated Parameters</b>										
Anion Sum	me/L	N/A		0.92	1.12	1.05	0.37	2.21	3.34	1.26
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		22	7	22	ND	ND	29	17
Calculated TDS	mg/L	1		48	66	60	25	134	189	72
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		0.77	1.12	1.11	0.48	2.28	3.20	1.22
Hardness (CaCO <sub>3</sub> )	mg/L	1		19	15	22	9	13	45	16
Ion Balance (% Difference)	%	N/A		9.30	0.10	2.70	12.60	1.40	2.30	1.60
Langelier Index (@ 20C)	N/A	N/A		-1.82	-3.18	-1.87	-6.71	-7.80	-1.21	-2.33
Langelier Index (@ 4C)	N/A	N/A		-2.14	-3.50	-2.19	-7.03	8.12	-1.53	-2.65
Saturation pH (@ 20C)	N/A	N/A		9.42	10.08	9.37	13.11	13.00	9.01	9.63
Saturation pH (@ 4C)	N/A	N/A		9.74	10.40	9.69	13.43	13.32	9.33	9.95
<b>Metals (ICP-MS)</b>										
Total Calcium (Ca)	mg/L	0.1		6.2	4.4	7.1	2.6	4.0	13.9	5.1

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	DE SAID LAKE	DRAIN LAKE	DUCK LAKE	FENERTY LAKE	FIRST CHAIN LAKE	FIRST LAKE	FLETCHERS LAKE
Community				Dartmouth	Middle Sackville	Beaverbank	Beaverbank	Halifax	Lower Sackville	Fall River
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/08/2011 8:50	29/11/2011 10:05	16/11/2011 12:00	22/11/2011 14:40	17/11/2011 14:25	23/11/2011 10:25	09/11/2011 14:20
Total Copper (Cu)	ug/L	2		ND	2	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		153	500	768	526	125	102	201
Total Magnesium (Mg)	mg/L	0.1		0.9	0.9	1.0	0.5	0.8	2.4	0.9
Total Manganese (Mn)	ug/L	2		42	37	99	112	91	34	48
Total Potassium (K)	mg/L	0.1		0.7	1.0	1.5	0.7	0.7	1.7	1.0
Total Sodium (Na)	mg/L	0.1		8.0	16.9	12.8	5.2	44.7	51.2	19.4
Total Zinc (Zn)	ug/L	5		ND	ND	ND	5	10	ND	ND
<b>MICROBIOLOGICAL</b>										
E. Coli Lake	MPN/100mL	1		1	ND	22	1	ND	12	2
E. Coli Outlet	MPN/100mL	1		4	--	11	ND	--	5	5
Chlorophyll A - Acidification method	µg/L	N/A		1.46	8.00	25.32	1.88	1.04	6.22	2.13
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.25	7.41	21.95	1.79	0.80	5.51	1.63

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	FRENCHMAN LAKE	FROG POND*	GOVERNOR'S LAKE	GRAND LAKE	HALF MILE LAKE	HUBLEY BIG LAKE	KEARNEY LAKE <sup>1</sup>	KIDSTON LAKE
Community				Burnside	Halifax	Timberlea	Enfield	Timberlea	Hubley	Bedford	Spryfield
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			14/11/2011 15:10	25/11/2011 11:10	15/11/2011 13:40	09/11/2011 13:10	25/11/2011 11:50	29/11/2011 14:10	16/10/2011 13:15	25/11/2011 9:45
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		N/A	N/A	0.9	4.1	N/A	1.3	N/A	N/A
Temp	Celsius	N/A		9.98	3.06	9.41	11.35	2.08	5.50	14.1	2.56
Dissolved Oxygen	mg/L	0.2	6-9.5	9.85	11.42	11.33	9.88	12.88	10.91	8.43	11.67
pH	pH	N/A	6.5-9.0	7.14	6.64	6.73	6.90	7.19	5.20	5.62	6.41
Specific Conductance	mS/cm	0.001		0.230	0.182	0.211	0.096	0.129	0.056	0.054	0.042
TDS	g/L	0.001		0.149	0.119	0.138	0.063	0.084	0.035	--	0.027
Salinity	ppt	0.01		0.11	0.09	0.10	0.05	0.06	0.03	--	0.02
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		15	20	7	6	16	ND	<5	7
Dissolved Chloride (Cl)	mg/L	1	120	52	32	44	18	25	13	10	5
Colour	TCU	5		115	65	124	24	124	125	120	158
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.4	0.9	0.4	ND	1.1	0.5		0.8
Nitrate + Nitrite	mg/L	0.05	13000	ND	0.16	0.20	0.11	0.38	0.06	<0.05	ND
Nitrate (N)	mg/L	0.05		ND	0.16	0.20	0.11	0.38	0.06	--	ND
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	--	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.33	0.17	ND	0.08	0.09	ND	<0.05	0.10
Total Organic Carbon (C)	mg/L	0.5		13.3	9.8	12.7	6.5	13.4	12.9	12	17.2
Orthophosphate (P)	mg/L	0.01		0.04	0.02	0.03	ND	0.04	ND	<0.01	0.14
pH (Lab)	pH	N/A	6.5-9.0	7.2	7.5	6.9	7.0	7.2	5.0	6.05	7.0
Total Phosphorus (1M depth)	mg/L	0.001		0.013	0.011	0.028	ND	0.047	0.019	0.013	0.012
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		3.4	4.4	3.1	1.8	5.2	ND	4	2.8
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	5.00	ND	<1	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		9.00	14.00	15.00	7.00	6.00	2.00	<2	3.00
Turbidity	NTU	0.1		4.1	1.4	4.2	0.7	5.9	0.9	0.6	1.4
Conductivity	uS/cm	1		222	179	211	94	121	50	54	41
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		1.95	1.60	1.71	0.78	1.18	0.41	0.28	0.34
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		15	20	7	6	16	ND	<1	7
Calculated TDS	mg/L	1		112	93	106	47	67	25	25	22
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	<1	ND
Cation Sum	me/L	N/A		1.93	1.59	1.91	0.84	1.16	0.47	0.49	0.51
Hardness (CaCO <sub>3</sub> )	mg/L	1		26	24	24	15	13	4	8	12
Ion Balance (% Difference)	%	N/A		0.50	0.40	5.70	3.40	0.80	6.60	27.30	19.10
Langelier Index (@ 20C)	N/A	N/A		-2.32	-1.89	-2.99	-3.12	-2.59	-8.49	NC	-3.10
Langelier Index (@ 4C)	N/A	N/A		-2.64	-2.21	-3.31	-3.44	-2.91	-8.81	NC	-3.42
Saturation pH (@ 20C)	N/A	N/A		9.52	9.39	9.89	10.12	9.79	13.49	NC	10.10
Saturation pH (@ 4C)	N/A	N/A		9.84	9.71	10.21	10.44	10.11	13.81	NC	10.42
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		7.9	7.8	7.2	4.5	3.8	1.1	2.2	3.8

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	FRENCHMAN LAKE	FROG POND*	GOVERNOR'S LAKE	GRAND LAKE	HALF MILE LAKE	HUBLEY BIG LAKE	KEARNEY LAKE <sup>1</sup>	KIDSTON LAKE
Community				Burnside	Halifax	Timberlea	Enfield	Timberlea	Hubley	Bedford	Spryfield
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			14/11/2011 15:10	25/11/2011 11:10	15/11/2011 13:40	09/11/2011 13:10	25/11/2011 11:50	29/11/2011 14:10	16/10/2011 13:15	25/11/2011 9:45
Total Copper (Cu)	ug/L	2		ND	ND	3	ND	2	ND	<2.0	ND
Total Iron (Fe)	ug/L	50		316	333	648	91	652	347	358	433
Total Magnesium (Mg)	mg/L	0.1		1.6	1.2	1.5	0.8	0.9	0.4	0.4	0.7
Total Manganese (Mn)	ug/L	2		19	10	129	21	56	28	23	8
Total Potassium (K)	mg/L	0.1		1.8	1.3	1.2	0.7	1.0	0.5	0.7	0.6
Total Sodium (Na)	mg/L	0.1		29.7	23.7	30.2	11.7	17.6	7.3	6.9	4.0
Total Zinc (Zn)	ug/L	5		ND	ND	13	ND	ND	ND	<5.0	ND
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		20	7	45	ND	14	2	<100	1
E. Coli Outlet	MPN/100mL	1		14	ND	19	--	--	1	--	ND
Chlorophyll A - Acidification method	µg/L	N/A		7.50	2.11	10.67	0.72	10.11	2.85	0.97	3.90
Chlorophyll A - Welschmeyer method	µg/L	N/A		6.53	1.86	9.59	0.60	9.13	2.65	0.82	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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	KINSAC LAKE	LAKE BANOOK	LAKE CHARLES	LAKE ECHO	LAKE MICMAC	LAKE THOMAS NORTH BASIN	LAKE THOMAS SOUTH BASIN	LAKE WILLIAM
Community				Fall River	Dartmouth	Dartmouth	Eastern Shore	Dartmouth	Waverley	Waverley	Waverley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 9:15	08/11/2011 8:25	08/11/2011 10:30	22/11/2011 10:25	08/11/2011 8:45	08/11/2011 13:55	08/11/2011 14:10	08/11/2011 11:55
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		2.0	5.4	3.1	1.1	4.3	2.5	3.0	3.1
Temp	Celsius	N/A		8.79	--	9.76	7.35	7.64	8.90	9.95	10.50
Dissolved Oxygen	mg/L	0.2	6-9.5	10.53	11.22	9.88	11.74	11.30	10.48	10.17	9.80
pH	pH	N/A	6.5-9.0	6.91	7.79	7.44	5.02	7.72	7.10	7.19	7.27
Specific Conductance	mS/cm	0.001		0.068	0.402	0.210	0.034	0.345	0.085	0.163	0.164
TDS	g/L	0.001		0.045	0.261	0.136	0.022	0.224	0.085	0.106	0.107
Salinity	ppt	0.01		0.03	0.19	0.10	0.01	0.17	0.06	0.08	0.08
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		ND	33	21	ND	29	10	21	11
Dissolved Chloride (Cl)	mg/L	1	120	12	91	44	5	76	27	34	35
Colour	TCU	5		66	9	19	130	23	61	37	33
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	ND	ND	0.8	ND	ND	ND	ND
Nitrate + Nitrite	mg/L	0.05	13000	ND	0.18	0.25	0.06	0.20	0.14	0.11	0.11
Nitrate (N)	mg/L	0.05		ND	0.18	0.25	0.06	0.20	0.14	0.11	0.11
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.07	0.26	0.17	0.12	0.18	0.05	0.11	0.11
Total Organic Carbon (C)	mg/L	0.5		11.6	4.6	6.0	15.9	5.3	8.2	6.7	6.8
Orthophosphate (P)	mg/L	0.01		ND	0.07	ND	ND	ND	ND	ND	0.07
pH (Lab)	pH	N/A	6.5-9.0	6.7	7.9	7.7	5.3	7.9	7.4	7.6	7.5
Total Phosphorus (1M depth)	mg/L	0.001		0.007	0.008	0.009	0.012	0.008	0.007	0.008	0.007
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		2.6	2.8	3.5	3.3	2.9	2.2	2.5	2.5
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		4.00	13.00	9.00	3.00	12.00	6.00	7.00	7.00
Turbidity	NTU	0.1		1.8	0.8	1.3	1.2	1.1	1.3	1.1	0.7
Conductivity	uS/cm	1		66	39	208	32	346	131	164	165
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		0.42	3.51	1.86	0.21	2.99	1.10	1.53	1.40
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	33	21	ND	29	10	21	11
Calculated TDS	mg/L	1		30	211	113	14	182	68	88	86
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		0.65	3.93	2.09	0.28	3.43	1.30	1.55	1.60
Hardness (CaCO <sub>3</sub> )	mg/L	1		11	49	28	5	44	17	22	22
Ion Balance (% Difference)	%	N/A		21.60	5.70	5.60	15.40	7.00	8.40	0.70	6.70
Langelier Index (@ 20C)	N/A	N/A		-6.36	-0.99	-1.62	-8.00	-1.09	-2.45	-1.81	-2.19
Langelier Index (@ 4C)	N/A	N/A		-6.68	-1.31	-1.94	-8.32	-1.41	-2.77	-2.13	-2.51
Saturation pH (@ 20C)	N/A	N/A		13.06	8.89	9.32	13.30	8.99	9.85	9.41	9.69
Saturation pH (@ 4C)	N/A	N/A		13.38	9.21	9.64	13.62	9.31	10.17	9.73	10.01
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		3.0	16.3	8.9	1.6	14.6	5.3	7.0	7.1

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	KINSAC LAKE	LAKE BANOOK	LAKE CHARLES	LAKE ECHO	LAKE MICMAC	LAKE THOMAS NORTH BASIN	LAKE THOMAS SOUTH BASIN	LAKE WILLIAM
Community				Fall River	Dartmouth	Dartmouth	Eastern Shore	Dartmouth	Waverley	Waverley	Waverley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 9:15	08/11/2011 8:25	08/11/2011 10:30	22/11/2011 10:25	08/11/2011 8:45	08/11/2011 13:55	08/11/2011 14:10	08/11/2011 11:55
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		238	76	105	453	83	209	112	111
Total Magnesium (Mg)	mg/L	0.1		0.8	2.1	1.4	0.3	1.9	0.9	1.1	1.1
Total Manganese (Mn)	ug/L	2		33	44	75	63	46	51	46	50
Total Potassium (K)	mg/L	0.1		0.8	1.7	1.4	0.5	1.6	1.0	1.2	1.2
Total Sodium (Na)	mg/L	0.1		8.7	66.0	33.6	2.3	57.1	20.8	24.4	25.4
Total Zinc (Zn)	ug/L	5		ND	ND	ND	ND	ND	ND	ND	ND
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		1	10	8	3	2	6	ND	5
E. Coli Outlet	MPN/100mL	1		--	13	11	1	--	1	--	5
Chlorophyll A - Acidification method	µg/L	N/A		4.78	1.86	4.27	0.80	1.73	1.67	1.78	1.65
Chlorophyll A - Welschmeyer method	µg/L	N/A		4.06	1.49	3.60	0.78	1.37	1.28	1.39	1.30

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
- <sup>1</sup> Taken from South East end of Lake
- <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	LISLE LAKE	LITTLE ALBRO LAKE	LONG LAKE	LONG POND	LOON LAKE	LOVETT LAKE	MAYNARD LAKE	McCABE LAKE
Community				Upper Sackville	Dartmouth	Mainland South	Herring Cove	Dartmouth	Lakeside	Dartmouth	Lucasville
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/11/2011 10:50	16/08/2011 14:00	30/11/2011 10:00	18/11/2011 9:50	22/11/2011 11:55	15/11/2011 12:55	14/11/2011 13:40	29/11/2011 11:05
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		2.0	N/A	1.1	0.8	3.7	N/A	4.4	1.4
Temp	Celsius	N/A		9.53	9.85	6.61	9.07	7.29	9.74	9.46	5.80
Dissolved Oxygen	mg/L	0.2	6-9.5	10.66	11.42	10.98	10.18	12.08	10.73	10.62	10.43
pH	pH	N/A	6.5-9.0	6.72	7.16	6.14	5.30	7.05	6.71	7.45	6.12
Specific Conductance	mS/cm	0.001		0.097	0.301	0.173	0.053	0.208	0.200	0.299	0.039
TDS	g/L	0.001		0.063	0.196	0.112	0.034	0.135	0.130	0.195	0.026
Salinity	ppt	0.01		0.05	0.14	0.08	0.02	0.10	0.10	0.14	0.02
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		16	12	ND	ND	20	9	21	ND
Dissolved Chloride (Cl)	mg/L	1	120	18	73	43	10	46	33	68	8
Colour	TCU	5		44	19	124	187	30	65	29	110
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	ND	ND	1.1	1.2	ND	1.2	0.7
Nitrate + Nitrite	mg/L	0.05	13000	0.15	0.09	0.08	0.09	0.11	0.27	ND	0.08
Nitrate (N)	mg/L	0.05		0.15	0.09	0.08	0.09	0.11	0.27	ND	0.08
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.17	0.08	0.07	0.15	0.20	ND	0.34	ND
Total Organic Carbon (C)	mg/L	0.5		6.8	4.0	14.0	19.2	6.1	10.6	4.6	13.2
Orthophosphate (P)	mg/L	0.01		0.02	ND	ND	ND	0.02	0.03	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.2	7.4	6.4	5.5	7.5	6.9	7.5	6.1
Total Phosphorus (1M depth)	mg/L	0.001		0.029	0.014	0.015	0.023	0.011	0.018	0.013	0.017
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		3.0	2.6	1.4	3.5	3.4	5.7	2.3	3.1
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		6.00	8.00	9	3.00	7.00	24.00	9.00	3.00
Turbidity	NTU	0.1		2.4	0.8	1.2	1.5	1.1	5.7	0.9	1.5
Conductivity	uS/cm	1		97	304	164	53	204	200	187	37
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		0.96	2.47	1.40	0.35	1.85	1.63	2.52	0.29
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		16	12	ND	ND	20	9	21	ND
Calculated TDS	mg/L	1		51	147	84	24	100	101	141	19
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		0.80	2.63	1.42	0.49	1.55	1.79	2.36	0.36
Hardness (CaCO <sub>3</sub> )	mg/L	1		16	22	13	6	23	31	31	6
Ion Balance (% Difference)	%	N/A		9.10	3.20	0.6	0.49	8.80	4.60	3.30	10.30
Langelier Index (@ 20C)	N/A	N/A		-2.47	-2.26	-7.59	-5.13	-1.91	-2.77	-1.80	-7.21
Langelier Index (@ 4C)	N/A	N/A		-2.79	-2.58	-7.91	-5.45	-2.23	-3.09	-2.12	-7.53
Saturation pH (@ 20C)	N/A	N/A		9.67	9.66	13.99	10.60	9.41	9.67	9.30	13.31
Saturation pH (@ 4C)	N/A	N/A		9.99	9.98	14.31	10.90	9.73	9.99	9.62	13.63
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		4.8	7.4	3.9	1.6	7.6	9.2	9.5	

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	LISLE LAKE	LITTLE ALBRO LAKE	LONG LAKE	LONG POND	LOON LAKE	LOVETT LAKE	MAYNARD LAKE	McCABE LAKE
Community				Upper Sackville	Dartmouth	Mainland South	Herring Cove	Dartmouth	Lakeside	Dartmouth	Lucasville
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			16/11/2011 10:50	16/08/2011 14:00	30/11/2011 10:00	18/11/2011 9:50	22/11/2011 11:55	15/11/2011 12:55	14/11/2011 13:40	29/11/2011 11:05
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	3	ND	
Total Iron (Fe)	ug/L	50		406	149	440	411	138	430	288	
Total Magnesium (Mg)	mg/L	0.1		0.9	0.9	0.7	0.5	1.0	1.9	1.7	
Total Manganese (Mn)	ug/L	2		37	39	22	23	72	82	177	
Total Potassium (K)	mg/L	0.1		1.0	0.8	0.6	0.6	1.2	1.5	1.3	
Total Sodium (Na)	mg/L	0.1		9.6	49.4	25.3	6.5	23.7	24.0	38.3	
Total Zinc (Zn)	ug/L	5		ND	29	6	ND	ND	21	ND	
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		12	4	ND	13	ND	36	17	ND
E. Coli Outlet	MPN/100mL	1		6	2	ND	11	ND	--	--	2
Chlorophyll A - Acidification method	µg/L	N/A		1.18	3.87	0.98	0.29	3.39	7.56	1.26	0.96
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.99	3.28	0.79	0.33	2.99	6.47	1.12	0.88

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
- <sup>1</sup> Taken from South East end of Lake
- <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	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	NINE MILE RIVER AT HWY 103
Community				Herring Cove	Spryfield	Timberlea	Fall River	Williamswood	Dartmouth	Dartmouth	Timberlea
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/11/2011 10:30	18/11/2011 9:10	15/11/2011 14:15	08/11/2011 13:20	25/11/2011 8:50	18/10/2011 10:55	04/08/2011 12:00	10/11/2011 13:20
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		N/A	N/A	N/A	1.8	N/A	2.8	2.2	N/A
Temp	Celsius	N/A		9.43	8.75	9.26	7.93	4.80	14.38	14.33	8.28
Dissolved Oxygen	mg/L	0.2	6-9.5	11.58	11.24	10.79	10.91	11.06	9.76	9.93	10.67
pH	pH	N/A	6.5-9.0	5.79	6.49	5.77	6.95	5.10	8.00	7.50	6.69
Specific Conductance	mS/cm	0.001		0.144	0.143	0.054	0.073	0.046	0.268	0.275	0.087
TDS	g/L	0.001		0.093	0.093	0.035	0.047	0.030	0.174	0.178	0.056
Salinity	ppt	0.01		0.07	0.07	0.02	0.03	0.02	0.13	0.13	0.04
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		ND	ND	ND	ND	ND	24	24	ND
Dissolved Chloride (Cl)	mg/L	1	120	34	32	11	14	7	59	61	16
Colour	TCU	5		132	141	121	83	214	20	22	114
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.9	0.8	ND	ND	0.6	3.6	3.9	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.22	0.32	ND	0.18	ND	0.13	0.10	0.42
Nitrate (N)	mg/L	0.05		0.22	0.32	ND	0.18	ND	0.13	0.10	0.42
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	1.01	0.14	ND	0.14	0.16	0.06	0.06	0.12
Total Organic Carbon (C)	mg/L	0.5		15.1	14.5	14.6	11.0	22.2	4.8	4.4	14.6
Orthophosphate (P)	mg/L	0.01		ND	ND	0.03	ND	0.01	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	6.2	6.4	5.9	6.9	5.5	7.7	7.7	6.5
Total Phosphorus (1M depth)	mg/L	0.001		0.014	0.025	0.014	0.013	0.019	0.012	0.010	0.045
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		2.2	4.2	3.1	1.8	4.1	4.4	4.4	3.7
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		6.00	6.00	3.00	5.00	3.00	9.00	9.00	5.00
Turbidity	NTU	0.1		1.3	2.4	1.9	1.6	2.4	2.1	1.4	1.9
Conductivity	uS/cm	1		149	146	53	73	42	265	272	85
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		1.10	1.05	0.37	0.51	0.26	2.34	2.39	0.59
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	24	24	ND
Calculated TDS	mg/L	1		71	70	26	35	19	139	140	41
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.38	1.38	0.59	0.70	0.46	2.56	2.50	0.83
Hardness (CaCO <sub>3</sub> )	mg/L	1		13	13	7	9	7	33	32	11
Ion Balance (% Difference)	%	N/A		1.38	13.60	22.30	15.30	28.20	4.40	2.10	17.10
Langelier Index (@ 20C)	N/A	N/A		-4.13	-3.88	-7.37	-6.21	-7.78	-1.48	-1.50	-6.54
Langelier Index (@ 4C)	N/A	N/A		-4.45	-4.20	-7.69	-6.53	-8.10	-1.80	-1.82	-6.86
Saturation pH (@ 20C)	N/A	N/A		10.30	10.30	13.27	13.11	13.28	9.18	9.20	13.04
Saturation pH (@ 4C)	N/A	N/A		10.70	10.60	13.59	13.43	13.60	9.50	9.52	13.36
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		3.5	3.9	1.8	2.7	1.7	11.0	10.5	3.2

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	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	NINE MILE RIVER AT HWY 103
Community				Herring Cove	Spryfield	Timberlea	Fall River	Williamswood	Dartmouth	Dartmouth	Timberlea
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/11/2011 10:30	18/11/2011 9:10	15/11/2011 14:15	08/11/2011 13:20	25/11/2011 8:50	18/10/2011 10:55	04/08/2011 12:00	10/11/2011 13:20
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		455	532	406	391	541	131	90	392
Total Magnesium (Mg)	mg/L	0.1		1.0	0.8	0.6	0.6	0.6	1.3	1.3	0.7
Total Manganese (Mn)	ug/L	2		18	26	43	51	31	51	26	42
Total Potassium (K)	mg/L	0.1		0.9	0.8	0.7	0.8	0.5	1.3	1.2	1.0
Total Sodium (Na)	mg/L	0.1		22.1	23.5	8.4	10.2	4.9	42.5	41.9	11.8
Total Zinc (Zn)	ug/L	5		7	7	8	ND	ND	ND	ND	ND
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		50	225	10	1	4	20	2	15
E. Coli Outlet	MPN/100mL	1		--	--	--	4	2	--	6	--
Chlorophyll A - Acidification method	µg/L	N/A		0.63	0.60	0.97	2.99	0.76	3.34	2.37	1.24
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.61	0.56	0.98	2.51	0.70	3.01	2.01	1.19

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
- <sup>1</sup> Taken from South East end of Lake
- <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	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				Shad Bay	Dartmouth	Bedford	Dartmouth	Porters Lake	Waverley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 14:25	14/11/2011 8:30	16/10/2011 16:15	14/11/2011 12:10	22/11/2011 9:30	10/11/2011 11:15	17/11/2011 14:50	08/11/2011 9:20
<b>FIELD DATA</b>				Sampled 0.5h after low tide							
Secchi Depth	Meters	N/A		N/A	2.6	N/A	N/A	1.3	3.1	N/A	N/A
Temp	Celsius	N/A		8.41	9.40	13.60	9.14	9.05	8.28	10.22	5.61
Dissolved Oxygen	mg/L	0.2	6-9.5	12.10	9.97	9.54	10.66	11.42	10.39	11.37	14.41
pH	pH	N/A	6.5-9.0	5.91	7.23	6.11	7.43	5.34	7.37	7.24	9.46
Specific Conductance	mS/cm	0.001		0.087	0.300	0.106	0.401	0.765	0.179	0.373	0.298
TDS	g/L	0.001		0.562	0.195	--	0.261	0.498	0.116	0.242	0.193
Salinity	ppt	0.01		0.43	0.14	--	0.19	0.38	0.08	0.18	0.14
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		ND	32	7	33	ND	21	44	29
Dissolved Chloride (Cl)	mg/L	1	120	235	62	34	91	205	35	75	59
Colour	TCU	5		146	43	48	16	114	28	25	11
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	0.6		1.0	1.0	ND	0.7	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.07	0.40	0.22	ND	ND	ND	0.42	0.26
Nitrate (N)	mg/L	0.05		0.07	0.40	--	ND	ND	ND	0.42	0.26
Nitrite (N)	mg/L	0.05		ND	ND	--	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.06	0.52	<0.05	0.21	0.08	0.07	0.07	0.19
Total Organic Carbon (C)	mg/L	0.5		16.1	6.9	5.6	5.3	14.1	6.0	7.0	4.5
Orthophosphate (P)	mg/L	0.01		ND	ND	<0.01	0.01	0.01	ND	0.02	ND
pH (Lab)	pH	N/A	6.5-9.0	6.0	7.7	6.60	7.8	5.8	7.6	7.9	8.2
Total Phosphorus (1M depth)	mg/L	0.001		0.016	0.027	0.007	0.019	0.011	0.009	0.019	0.008
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		4.3	4.5	3	1.7	3.1	2.7	4.1	1.0
Total Suspended Solids	mg/L	5		ND	ND	<1	ND	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		33.00	10.00	9	13.00	29.00	6.00	16.00	17.00
Turbidity	NTU	0.1		1.6	1.6	0.5	13.3	2.1	0.8	1.9	1.7
Conductivity	uS/cm	1		885	290	150	385	743	177	372	296
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		7.31	2.62	1.30	3.49	6.38	1.53	3.36	2.61
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	32	7	33	ND	21	44	29
Calculated TDS	mg/L	1		449	150	79	200	345	91	191	162
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	<1	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		8.57	2.65	1.27	3.50	5.27	1.69	3.24	3.06
Hardness (CaCO <sub>3</sub> )	mg/L	1		90	50	16	50	60	26	53	44
Ion Balance (% Difference)	%	N/A		7.90	0.60	1.17	0.10	9.50	5.00	1.70	7.80
Langelier Index (@ 20C)	N/A	N/A		-6.88	-1.18	-3.17	-1.06	-7.12	-1.54	-0.79	-0.78
Langelier Index (@ 4C)	N/A	N/A		-7.20	-1.50	-3.42	-1.38	-7.44	-1.86	-1.11	-1.10
Saturation pH (@ 20C)	N/A	N/A		12.88	8.88	9.77	8.86	12.92	9.34	8.69	8.98
Saturation pH (@ 4C)	N/A	N/A		13.20	9.20	10.00	9.18	13.24	9.66	9.01	9.30
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		5.9	16.4	5.0	17.3	5.3	8.3	19.2	14.7

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	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				Shad Bay	Dartmouth	Bedford	Dartmouth	Porters Lake	Waverley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 14:25	14/11/2011 8:30	16/10/2011 16:15	14/11/2011 12:10	22/11/2011 9:30	10/11/2011 11:15	17/11/2011 14:50	08/11/2011 9:20
Total Copper (Cu)	ug/L	2		ND	2	<2.0	2	ND	ND	ND	ND
Total Iron (Fe)	ug/L	50		313	191	181	611	383	147	206	225
Total Magnesium (Mg)	mg/L	0.1		18.3	2.2	0.9	1.7	11.4	1.2	1.3	1.7
Total Manganese (Mn)	ug/L	2		19	108	31	38	62	154	9	16
Total Potassium (K)	mg/L	0.1		4.8	1.7	1.0	2.1	4.3	1.6	1.9	1.5
Total Sodium (Na)	mg/L	0.1		151.0	35.6	20.9	52.8	89.5	25.7	48.6	48.6
Total Zinc (Zn)	ug/L	5		ND	ND	10	ND	ND	ND	ND	ND
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		2	44	<100	39	4	2	28	2
E. Coli Outlet	MPN/100mL	1		--	118	--	34	--	2	--	2
Chlorophyll A - Acidification method	µg/L	N/A		0.93	1.36	1.33	3.59	0.24	2.73	7.22	4.13
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.92	1.21	1.13	3.42	0.27	2.34	6.16	3.56

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
- <sup>1</sup> Taken from South East end of Lake
- <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 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
Community				Bedford	Dartmouth	Bedford	Bedford	Bedford	Glen Arbour	Middle Sackville	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 10:15	09/11/2011 12:00	15/11/2011 9:15	15/11/2011 8:55	15/11/2011 11:50	29/11/2011 11:55	23/11/2011 9:20	14/11/2011 14:35
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		1.8	1.4	N/A	N/A	1.5	N/A	N/A	N/A
Temp	Celsius	N/A		7.58	8.0	9.42	9.50	9.17	5.79	6.58	9.12
Dissolved Oxygen	mg/L	0.2	6-9.5	11.70	10.5	11.12	11.28	10.59	11.90	11.36	10.34
pH	pH	N/A	6.5-9.0	7.56	5.7	6.63	6.79	6.86	6.61	6.98	7.43
Specific Conductance	mS/cm	0.001		0.244	0.387	0.060	0.064	0.105	0.056	0.118	0.238
TDS	g/L	0.001		0.159	--	0.039	0.041	0.068	0.037	0.077	0.154
Salinity	ppt	0.01		0.12	--	0.03	0.03	0.05	0.03	0.06	0.11
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO3)	mg/L	5		41	35	ND	ND	ND	6	21	30
Dissolved Chloride (Cl)	mg/L	1	120	38	94	11	12	22	6	23	50
Colour	TCU	5		28	21	108	99	93	26	ND	57
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	--	ND	0.7	2.1	0.4	1.2	0.9
Nitrate + Nitrite	mg/L	0.05	13000	0.25	ND	0.08	0.09	0.07	0.10	ND	0.10
Nitrate (N)	mg/L	0.05		0.25	--	0.08	0.09	0.07	0.10	ND	0.10
Nitrite (N)	mg/L	0.05		ND	--	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.06	ND	ND	ND	ND	ND	0.08	0.17
Total Organic Carbon (C)	mg/L	0.5		6.4	ND	12.8	12.8	10.8	5.7	7.4	9.3
Orthophosphate (P)	mg/L	0.01		ND	ND	0.01	0.02	0.03	ND	0.02	ND
pH (Lab)	pH	N/A	6.5-9.0	8.0	7.6	6.6	6.9	6.8	6.8	7.3	7.6
Total Phosphorus (1M depth)	mg/L	0.001		0.008	0.017	0.016	0.015	0.017	0.016	0.014	0.037
Reactive Silica (SiO2)	mg/L	0.5		4.7	2.5	3.5	3.6	3.7	2.8	2.0	1.7
Total Suspended Solids	mg/L	5		ND	3	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO4)	mg/L	2		14.00	13.00	3.00	3.00	5.00	4.00	4.00	7.00
Turbidity	NTU	0.1		2.1	1.2	2.4	2.8	3.1	1.4	3.7	7.1
Conductivity	uS/cm	1		239	390	60	66	106	39	116	227
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		2.20	--	0.38	0.41	0.73	0.38	1.15	2.16
Bicarb. Alkalinity (calc. as CaCO3)	mg/L	1		41	35	ND	ND	ND	6	21	30
Calculated TDS	mg/L	1		131	207	28	31	49	22	63	122
Carb. Alkalinity (calc. as CaCO3)	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.42	--	0.66	0.73	1.01	0.38	1.09	2.16
Hardness (CaCO3)	mg/L	1		53	47	10	10	13	9	19	39
Ion Balance (% Difference)	%	N/A		4.80	--	27.00	28.30	16.20	0.10	2.70	0.10
Langelier Index (@ 20C)	N/A	N/A		-0.72	--	-7.52	-7.19	-6.20	-3.55	-2.22	-1.42
Langelier Index (@ 4C)	N/A	N/A		-1.04	--	-7.84	-7.51	-6.52	-3.87	-2.54	-1.74
Saturation pH (@ 20C)	N/A	N/A		8.72	--	14.12	14.09	13.00	10.35	9.52	9.02
Saturation pH (@ 4C)	N/A	N/A		9.04	--	14.44	14.41	13.32	10.67	9.84	9.34
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		18.5	16	2.6	2.8	3.6	2.5	5.3	12.6

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 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
Community				Bedford	Dartmouth	Bedford	Bedford	Bedford	Glen Arbour	Middle Sackville	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			10/11/2011 10:15	09/11/2011 12:00	15/11/2011 9:15	15/11/2011 8:55	15/11/2011 11:50	29/11/2011 11:55	23/11/2011 9:20	14/11/2011 14:35
Total Copper (Cu)	ug/L	2		ND	--	ND	ND	ND	ND	ND	2
Total Iron (Fe)	ug/L	50		155	--	607	614	687	236	258	741
Total Magnesium (Mg)	mg/L	0.1		1.6	1.9	0.8	0.8	0.9	0.7	1.3	1.9
Total Manganese (Mn)	ug/L	2		81	--	77	75	185	45	58	99
Total Potassium (K)	mg/L	0.1		3.7	1.9	0.8	0.8	1.0	0.9	1.0	1.5
Total Sodium (Na)	mg/L	0.1		28.8	57	8.6	9.9	15.2	3.5	14.8	28.6
Total Zinc (Zn)	ug/L	5		ND	--	11	13	7	ND	ND	ND
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		2	4	32	81	16	1	2	222
E. Coli Outlet	MPN/100mL	1		--	4	--	--	17	1	6	196
Chlorophyll A - Acidification method	µg/L	N/A		31.65	18.67	1.10	1.06	1.68	3.27	7.44	9.78
Chlorophyll A - Welschmeyer method	µg/L	N/A		26.01	N/A	1.03	1.00	1.40	2.79	6.41	9.59

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	SHELDRAKE LAKE	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE	THIRD LAKE	TUCKER LAKE	WHIMSICAL LAKE*	WHYNDER (WINDER) LAKE
Community				Hubley	Dartmouth	Middle Sackville	Upper Tantallon	Windsor Junction	Beaverbank	Mainland South	North Preston
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			30/11/2011 11:20	18/10/2011 8:35	29/11/2011 9:10	29/11/2011 1:15	22/11/2011 13:35	15/11/2011 10:05	18/11/2011 12:30	14/11/2011 10:50
<b>FIELD DATA</b>											
Secchi Depth	Meters	N/A		0.9	n/a	2.2	2.4	3.3	2.2	2.0	N/A
Temp	Celsius	N/A		5.58	11.07	5.03	6.18	8.80	9.16	9.75	8.76
Dissolved Oxygen	mg/L	0.2	6-9.5	9.23	9.45	11.66	10.15	11.39	10.35	10.86	8.16
pH	pH	N/A	6.5-9.0	5.29	7.42	7.16	5.53	7.20	7.10	7.10	6.99
Specific Conductance	mS/cm	0.001		0.071	0.138	0.084	0.040	0.127	0.193	0.216	0.147
TDS	g/L	0.001		0.046	0.090	0.055	0.026	0.080	0.126	0.140	0.096
Salinity	ppt	0.01		0.03	0.07	0.04	0.02	0.06	0.09	0.10	0.07
<b>INORGANICS</b>											
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		ND	25	7	ND	13	20	20	24
Dissolved Chloride (Cl)	mg/L	1	120	15	18	16	8	24	40	32	18
Colour	TCU	5		173	140	42	101	26	41	30	46
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.9	3.2	0.4	0.5	0.7	ND	0.7	29.5
Nitrate + Nitrite	mg/L	0.05	13000	0.12	0.10	0.12	0.08	0.09	ND	0.44	0.96
Nitrate (N)	mg/L	0.05		0.12	0.10	0.12	0.08	0.09	ND	0.44	0.96
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.07	ND	0.07	ND	0.10	ND	0.55	0.49
Total Organic Carbon (C)	mg/L	0.5		17.4	16.0	7.4	13.4	5.9	6.0	5.4	8.7
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	0.01	0.03	0.02	1.06
pH (Lab)	pH	N/A	6.5-9.0	6.3	7.2	7.1	5.5	7.4	7.5	7.7	7.4
Total Phosphorus (1M depth)	mg/L	0.001		0.028	0.012	0.008	0.017	0.009	0.011	0.014	0.062
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		4.2	7.4	2.4	3.1	2.2	2.1	4.3	4.0
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND	ND	ND	ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		4	14.00	6.00	3.00	5.00	7.00	28.00	13.00
Turbidity	NTU	0.1		1.7	1.8	1.7	1.4	1.0	2.5	2.2	1.1
Conductivity	uS/cm	1		69	138	78	37	121	192	221	141
<b>Calculated Parameters</b>											
Anion Sum	me/L	N/A		0.51	1.31	0.72	0.29	1.05	1.67	1.92	1.33
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	25	7	ND	13	20	20	24
Calculated TDS	mg/L	1		32	77	42	19	59	96	115	77
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND	ND	ND	ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		0.56	1.40	0.71	0.37	0.99	1.69	1.93	1.26
Hardness (CaCO <sub>3</sub> )	mg/L	1		6	33	15	5	19	30	37	20
Ion Balance (% Difference)	%	N/A		3.8	3.40	1.30	12.10	3.00	0.60	1.93	2.60
Langelier Index (@ 20C)	N/A	N/A		-8.01	-1.94	-2.95	-7.90	-3.26	-1.82	-1.51	-1.99
Langelier Index (@ 4C)	N/A	N/A		-8.33	-2.26	-3.27	-8.22	-3.58	-2.14	-1.83	-2.31
Saturation pH (@ 20C)	N/A	N/A		14.31	9.14	10.05	13.40	9.66	9.32	9.21	9.39
Saturation pH (@ 4C)	N/A	N/A		14.63	9.46	10.37	13.72	9.98	9.64	9.53	9.71
<b>Metals (ICP-MS)</b>											
Total Calcium (Ca)	mg/L	0.1		1.7	10.9	4.5	1.3	6.2	9.2	12.2	6.4

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	SHELDRAKE LAKE	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE	THIRD LAKE	TUCKER LAKE	WHIMSICAL LAKE*	WHYNDER (WINDER) LAKE
Community				Hubley	Dartmouth	Middle Sackville	Upper Tantallon	Windsor Junction	Beaverbank	Mainland South	North Preston
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			30/11/2011 11:20	18/10/2011 8:35	29/11/2011 9:10	29/11/2011 1:15	22/11/2011 13:35	15/11/2011 10:05	18/11/2011 12:30	14/11/2011 10:50
Total Copper (Cu)	ug/L	2		ND	ND	ND	ND	ND	ND	3	2
Total Iron (Fe)	ug/L	50		505	562	421	536	123	157	143	125
Total Magnesium (Mg)	mg/L	0.1		0.4	1.5	0.8	0.4	0.8	1.6	1.6	0.9
Total Manganese (Mn)	ug/L	2		56	90	50	50	161	30	36	15
Total Potassium (K)	mg/L	0.1		0.6	1.0	0.9	0.5	1.0	1.4	1.7	2.1
Total Sodium (Na)	mg/L	0.1		8.3	15.0	8.2	4.6	12.8	24.0	23.5	17.4
Total Zinc (Zn)	ug/L	5		7	6	ND	ND	ND	ND	18	6
<b>MICROBIOLOGICAL</b>											
E. Coli Lake	MPN/100mL	1		2	35	ND	1	1	26	35	50
E. Coli Outlet	MPN/100mL	1		5	--	3	ND	1	10	42	41
Chlorophyll A - Acidification method	µg/L	N/A		1.25	0.15	0.94	0.72	2.08	7.72	1.44	7.17
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.23	0.17	0.76	0.64	1.71	6.72	1.29	6.59

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
- <sup>1</sup> Taken from South East end of Lake
- <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	WILLIAMS LAKE*
Community				Halifax
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/11/2011 11:35
<b>FIELD DATA</b>				
Secchi Depth	Meters	N/A		2.7
Temp	Celsius	N/A		9.23
Dissolved Oxygen	mg/L	0.2	6-9.5	11.80
pH	pH	N/A	6.5-9.0	6.52
Specific Conductance	mS/cm	0.001		0.158
TDS	g/L	0.001		0.103
Salinity	ppt	0.01		0.07
<b>INORGANICS</b>				
Total Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	5		ND
Dissolved Chloride (Cl)	mg/L	1	120	35
Colour	TCU	5		48
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.8
Nitrate + Nitrite	mg/L	0.05	13000	0.17
Nitrate (N)	mg/L	0.05		0.17
Nitrite (N)	mg/L	0.05		ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.64
Total Organic Carbon (C)	mg/L	0.5		7.3
Orthophosphate (P)	mg/L	0.01		ND
pH (Lab)	pH	N/A	6.5-9.0	7.0
Total Phosphorus (1M depth)	mg/L	0.001		0.012
Reactive Silica (SiO <sub>2</sub> )	mg/L	0.5		0.7
Total Suspended Solids	mg/L	5		ND
Dissolved Sulphate (SO <sub>4</sub> )	mg/L	2		10.00
Turbidity	NTU	0.1		1.0
Conductivity	uS/cm	1		165
<b>Calculated Parameters</b>				
Anion Sum	me/L	N/A		1.21
Bicarb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND
Calculated TDS	mg/L	1		79
Carb. Alkalinity (calc. as CaCO <sub>3</sub> )	mg/L	1		ND
Cation Sum	me/L	N/A		1.50
Hardness (CaCO <sub>3</sub> )	mg/L	1		15
Ion Balance (% Difference)	%	N/A		1.50
Langelier Index (@ 20C)	N/A	N/A		-3.24
Langelier Index (@ 4C)	N/A	N/A		-3.56
Saturation pH (@ 20C)	N/A	N/A		10.20
Saturation pH (@ 4C)	N/A	N/A		10.60
<b>Metals (ICP-MS)</b>				
Total Calcium (Ca)	mg/L	0.1		4.4

HRM Water Quality Monitoring Program Results - Fall 2011

Fall 2011	Units	RDL	CCME Guideline Level <sup>†</sup>	WILLIAMS LAKE*
Community				Halifax
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			18/11/2011 11:35
Total Copper (Cu)	ug/L	2		ND
Total Iron (Fe)	ug/L	50		267
Total Magnesium (Mg)	mg/L	0.1		0.9
Total Manganese (Mn)	ug/L	2		35
Total Potassium (K)	mg/L	0.1		0.9
Total Sodium (Na)	mg/L	0.1		25.4
Total Zinc (Zn)	ug/L	5		10
<b>MICROBIOLOGICAL</b>				
E. Coli Lake	MPN/100mL	1		f5
E. Coli Outlet	MPN/100mL	1		13
Chlorophyll A - Acidification method	µg/L	N/A		0.96
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.82

**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> CCME - Canadian Council of Ministers of Environment. Recreational Water Quality
  - <sup>1</sup> Taken from South East end of Lake
  - <sup>2</sup> Taken from South West end of Lake
- Dissolved Oxygen Guideline: lowest acceptable level depending on temperature and life