

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	BARRETT LAKE	BLACK DUCK POND	BLACK POINT LAKE	DENT'S PUNCH BOWL	DE SAID LAKE
Community				Beaverbank	Lakeside	Hubley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			14/04/2011 13:50	20/04/2011 13:55	20/04/2011 11:05	20/04/2011 14:40	13/04/2011 9:05
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		16	ND	ND	46	22
Dissolved Chloride (Cl)	mg/L	1		65	243	41	221	28
Colour	TCU	5		11	9	48	ND	8
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	ND	0.8	1.8	0.4
Nitrate + Nitrite	mg/L	0.05	13000	0.09	0.11	ND	ND	0.06
Nitrate (N)	mg/L	0.05		0.09	0.11	ND	ND	0.06
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		3.5	2.7	7.2	3.8	3.3
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.2	5.1	5.5	8.0	7.5
Total Phosphorus (1M depth)	mg/L	0.002		0.011	0.007	0.014	0.009	0.006
Reactive Silica (SiO ₂)	mg/L	0.5		2.8	4.8	ND	ND	1.9
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND
Dissolved Sulphate (SO ₄)	mg/L	2		8	33	4	27	9
Turbidity	NTU	0.1		1.2	1.2	1.5	1.4	6.0
Conductivity	uS/cm	1		261	868	151	881	135
Calculated Parameters								
Anion Sum	me/L	N/A		2.32	7.54	1.24	7.71	1.42
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		16	ND	ND	46	22
Calculated TDS	mg/L	1		129	450	74	457	75
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.07	7.80	1.35	8.19	1.14
Hardness (CaCO ₃)	mg/L	1		24	73	13	103	23
Ion Balance (% Difference)	%	N/A		5.80	1.70	4.20	3.10	11.00

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Spring 2011	Units	RDL	CCME Guideline Level[†]	BARRETT LAKE	BLACK DUCK POND	BLACK POINT LAKE	DENT'S PUNCH BOWL	DE SAID LAKE
Community				Beaverbank	Lakeside	Hubley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			14/04/2011 13:50	20/04/2011 13:55	20/04/2011 11:05	20/04/2011 14:40	13/04/2011 9:05
Langelier Index (@ 20C)	N/A	N/A		-2.30	-8.16	-8.54	-0.42	-1.87
Langelier Index (@ 4C)	N/A	N/A		-2.62	-8.48	-8.86	-0.74	-2.19
Saturation pH (@ 20C)	N/A	N/A		9.50	13.26	14.04	8.42	9.37
Saturation pH (@ 4C)	N/A	N/A		9.82	13.58	14.36	8.74	9.69
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		7.8	24.7	3.4	36.9	7.3
Total Copper (Cu)	µg/L	2		ND	2	ND	ND	ND
Total Iron (Fe)	µg/L	50		206	144	190	159	201
Total Magnesium (Mg)	mg/L	0.1		1.1	2.7	0.7	2.6	1.2
Total Manganese (Mn)	µg/L	2		128	387	57	23	53
Total Potassium (K)	mg/L	0.1		1.0	1.6	0.6	3.0	0.7
Total Sodium (Na)	mg/L	0.1		35.5	143.0	23.9	139.0	14.8
Total Zinc (Zn)	µg/L	5		ND	62	6	13	7
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		172	345	249	144	225
Total Coliform Outlet	MPN/100mL	2		>2420	435	411	--	613
E. Coli Lake	MPN/100mL	2		82	ND	1	1	ND
E. Coli Outlet	MPN/100mL	2		127	4	ND	--	ND
Chlorophyll A - Acidification method	µg/L	N/A		4.40	0.76	3.11	11.78	2.27
Chlorophyll A - Welschmeyer method	µg/L	N/A		4.12	0.68	3.11	10.66	2.32

Notes:

-- Not Analysed

NC Not Calculable

ND Not Detected

N/A Not Applicable

MPN Most Probable Number

RDL Reportable Detection Limit

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

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level[†]	BARRETT LAKE	BLACK DUCK POND	BLACK POINT LAKE	DENT'S PUNCH BOWL	DE SAID LAKE
Community				Beaverbank	Lakeside	Hubley	Cowie Hill	Dartmouth
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			14/04/2011 13:50	20/04/2011 13:55	20/04/2011 11:05	20/04/2011 14:40	13/04/2011 9:05

ug Micrograms

mg Milligrams

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

Bacterial level of concern for s (≥ 200 but < 400)

Bacterial level unsuitable for s (≥ 400)

* Records marked * indicate that the main watercourse sample was collected earlier than the watercourse outlet. When different, the Outlet Date and Time is reported in line below.

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	DRAIN LAKE	DUCK LAKE	FENERTY LAKE	HALF MILE LAKE	HUBLEY BIG LAKE
Community				Middle Sackville	Beaverbank	Beaverbank	Timberlea	Hubley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			15/04/2011 10:30	14/04/2011 12:10	14/04/2011 15:30	20/04/2011 13:10	20/04/2011 9:10
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		ND	24	ND	6	ND
Dissolved Chloride (Cl)	mg/L	1		64	198	16	175	16
Colour	TCU	5		14	8	21	21	64
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.8	0.8	ND	0.5	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.08	ND	0.10	0.14	ND
Nitrate (N)	mg/L	0.05		0.08	ND	0.10	0.14	ND
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.23	ND	0.07	ND	ND
Total Organic Carbon (C)	mg/L	0.5		4.2	4.0	4.4	4.4	7.0
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.0	7.5	6.5	7.0	5.7
Total Phosphorus (1M depth)	mg/L	0.002		0.030	0.030	0.015	0.017	0.013
Reactive Silica (SiO ₂)	mg/L	0.5		0.5	1.7	2.4	1.2	3.0
Total Suspended Solids	mg/L	5		ND	10	ND	7	ND
Dissolved Sulphate (SO ₄)	mg/L	2		12	14	5	12	3
Turbidity	NTU	0.1		2.1	7.7	1.4	6.1	0.9
Conductivity	uS/cm	1		261	721	75	590	61
Calculated Parameters								
Anion Sum	me/L	N/A		2.06	6.35	0.56	5.31	0.51
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	24	ND	6	ND
Calculated TDS	mg/L	1		127	358	42	307	29
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		2.27	5.92	1.01	5.17	0.47
Hardness (CaCO ₃)	mg/L	1		24	58	15	39	5
Ion Balance (% Difference)	%	N/A		4.90	3.50	28.40	1.30	4.80

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Spring 2011	Units	RDL	CCME Guideline Level†	DRAIN LAKE	DUCK LAKE	FENERTY LAKE	HALF MILE LAKE	HUBLEY BIG LAKE
Community				Middle Sackville	Beaverbank	Beaverbank	Timberlea	Hubley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			15/04/2011 10:30	14/04/2011 12:10	14/04/2011 15:30	20/04/2011 13:10	20/04/2011 9:10
Langelier Index (@ 20C)	N/A	N/A		-6.71	-1.46	-7.37	-2.76	-8.75
Langelier Index (@ 4C)	N/A	N/A		-7.03	-1.78	-7.69	-3.08	-9.07
Saturation pH (@ 20C)	N/A	N/A		13.71	8.96	13.87	9.76	14.45
Saturation pH (@ 4C)	N/A	N/A		14.03	9.28	14.19	10.08	14.77
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		7.8	20.0	4.8	12.6	1.2
Total Copper (Cu)	µg/L	2		ND	ND	ND	ND	ND
Total Iron (Fe)	µg/L	50		284	661	194	250	184
Total Magnesium (Mg)	mg/L	0.1		1.1	2.0	0.7	1.7	0.4
Total Manganese (Mn)	µg/L	2		63	588	121	71	29
Total Potassium (K)	mg/L	0.1		1.0	1.5	0.7	1.3	0.5
Total Sodium (Na)	mg/L	0.1		39.6	107.0	8.0	99.8	7.6
Total Zinc (Zn)	µg/L	5		12	ND	15	8	ND
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		219	1414	275	326	93
Total Coliform Outlet	MPN/100mL	2		--	>2420	816	517	96
E. Coli Lake	MPN/100mL	2		ND	1	ND	1	ND
E. Coli Outlet	MPN/100mL	2		--	33	ND	1	ND
Chlorophyll A - Acidification method	µg/L	N/A		12.50	52.74	5.87	3.96	2.92
Chlorophyll A - Welschmeyer method	µg/L	N/A		11.88	48.26	5.59	4.08	2.79

Notes:

- | | |
|--------------------------------|---------------------------------|
| -- Not Analysed | Russell Lake - sampled by JWL |
| NC Not Calculable | Morris Lake - sampled by JWL |
| ND Not Detected | |
| N/A Not Applicable | CCME - Canadian Council of M |
| MPN Most Probable Number | Fecal Coliform Guideline: for C |
| RDL Reportable Detection Limit | Dissolved Oxygen Guideline: Ic |

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Spring 2011	Units	RDL	CCME Guideline Level[†]	DRAIN LAKE	DUCK LAKE	FENERTY LAKE	HALF MILE LAKE	HUBLEY BIG LAKE
Community				Middle Sackville	Beaverbank	Beaverbank	Timberlea	Hubley
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			15/04/2011 10:30	14/04/2011 12:10	14/04/2011 15:30	20/04/2011 13:10	20/04/2011 9:10

ug Micrograms

mg Milligrams

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

Bacterial level of concern for s

Bacterial level unsuitable for s

* Records marked * indicate that the main watercourse sample was collected earlier th

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	KEARNEY LAKE¹	KIDSTON LAKE	LAKE ECHO	LONG POND	LOVETT LAKE
Community				Bedford	Spryfield	Eastern Shore	Herring Cove	Lakeside
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			13/05/2011 11:00	15/04/2011 13:00	08/04/2011 11:40	21/04/2011 9:30	20/04/2011 14:20
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		5	6	ND	ND	ND
Dissolved Chloride (Cl)	mg/L	1		24	9	11	29	248
Colour	TCU	5		39	57	59	64	5
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		--	ND	ND	ND	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.69	ND	0.06	0.10	0.26
Nitrate (N)	mg/L	0.05		0.69	ND	0.06	0.10	0.26
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	0.05	ND	0.06	0.10	ND
Total Organic Carbon (C)	mg/L	0.5		4.5	8.0	7.7	7.1	3.0
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	6.4	7.0	5.6	6.1	6.8
Total Phosphorus (1M depth)	mg/L	0.002		0.009	0.007	0.011	0.013	0.009
Reactive Silica (SiO ₂)	mg/L	0.5		2.8	1.3	2.5	2.7	4.7
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND
Dissolved Sulphate (SO ₄)	mg/L	2		10	4	4	5	27
Turbidity	NTU	0.1		0.4	0.7	0.9	0.8	2.4
Conductivity	uS/cm	1		110	53	42	115	877
Calculated Parameters								
Anion Sum	me/L	N/A		1.03	0.46	0.40	0.93	7.04
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		5	6	ND	ND	ND
Calculated TDS	mg/L	1		65	29	23	78	421
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.00	0.59	0.35	2.12	7.66
Hardness (CaCO ₃)	mg/L	1		16	19	6	63	74
Ion Balance (% Difference)	%	N/A		1.48	12.70	5.90	39.10	4.30

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level†	KEARNEY LAKE¹	KIDSTON LAKE	LAKE ECHO	LONG POND	LOVETT LAKE
Community				Bedford	Spryfield	Eastern Shore	Herring Cove	Lakeside
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			13/05/2011 11:00	15/04/2011 13:00	08/04/2011 11:40	21/04/2011 9:30	20/04/2011 14:20
Langelier Index (@ 20C)	N/A	N/A		-3.50	-2.96	-7.67	-7.14	-7.04
Langelier Index (@ 4C)	N/A	N/A		-3.75	-3.28	-7.99	-7.46	-7.36
Saturation pH (@ 20C)	N/A	N/A		9.92	9.96	13.27	13.24	13.24
Saturation pH (@ 4C)	N/A	N/A		10.20	10.28	13.59	13.56	13.56
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		4.9	6.3	1.8	21.7	25.4
Total Copper (Cu)	µg/L	2		ND	ND	ND	ND	ND
Total Iron (Fe)	µg/L	50		107	125	185	266	191
Total Magnesium (Mg)	mg/L	0.1		0.9	0.7	0.4	2.1	2.6
Total Manganese (Mn)	µg/L	2		28	5	62	45	207
Total Potassium (K)	mg/L	0.1		1.1	0.6	0.4	0.9	1.7
Total Sodium (Na)	mg/L	0.1		14.8	4.1	4.2	16.8	140.0
Total Zinc (Zn)	µg/L	5		ND	16	ND	673	38
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		120	147	93	120	435
Total Coliform Outlet	MPN/100mL	2		--	980	378	144	--
E. Coli Lake	MPN/100mL	2		1	ND	ND	1	4
E. Coli Outlet	MPN/100mL	2		--	ND	ND	1	--
Chlorophyll A - Acidification method	µg/L	N/A		0.93	1.94	5.89	2.25	1.58
Chlorophyll A - Welschmeyer method	µg/L	N/A		0.84	1.67	5.95	2.23	1.38

Notes:

- | | |
|--------------------------------|---------------------------------|
| -- Not Analysed | Russell Lake - sampled by JWL |
| NC Not Calculable | Morris Lake - sampled by JWL |
| ND Not Detected | |
| N/A Not Applicable | CCME - Canadian Council of M |
| MPN Most Probable Number | Fecal Coliform Guideline: for C |
| RDL Reportable Detection Limit | Dissolved Oxygen Guideline: Ic |

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level [†]	KEARNEY LAKE ¹	KIDSTON LAKE	LAKE ECHO	LONG POND	LOVETT LAKE
Community				Bedford	Spryfield	Eastern Shore	Herring Cove	Lakeside
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			13/05/2011 11:00	15/04/2011 13:00	08/04/2011 11:40	21/04/2011 9:30	20/04/2011 14:20

ug Micrograms Bacterial level of concern for s

mg Milligrams Bacterial level unsuitable for s

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

* Records marked * indicate that the main watercourse sample was collected earlier th

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	McCABE LAKE	MCINTOSH RUN at Mouth	MCINTOSH RUN at ROACHES POND	MOODY LAKE	NINE MILE RIVER AT HWY 103
Community				Lucasville	Herring Cove	Spryfield	Williamswood	Timberlea
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 10:30	20/04/2011 15:50	20/04/2011 15:20	15/04/2011 11:45	19/04/2011 15:20
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		ND	ND	ND	ND	ND
Dissolved Chloride (Cl)	mg/L	1		14	56	65	13	36
Colour	TCU	5		33	52	49	75	46
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	ND	ND	ND	0.7
Nitrate + Nitrite	mg/L	0.05	13000	ND	ND	0.07	ND	0.33
Nitrate (N)	mg/L	0.05		ND	ND	0.07	ND	0.33
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	0.09	ND	ND	0.10
Total Organic Carbon (C)	mg/L	0.5		5.7	7.1	7.5	8.9	7.2
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	0.02
pH (Lab)	pH	N/A	6.5-9.0	6.2	6.2	6.6	5.6	6.5
Total Phosphorus (1M depth)	mg/L	0.002		0.008	0.012	0.015	0.012	0.042
Reactive Silica (SiO ₂)	mg/L	0.5		2.6	2.4	3.2	2.4	2.9
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND
Dissolved Sulphate (SO ₄)	mg/L	2		4	7	9	4	7
Turbidity	NTU	0.1		1.0	1.0	2.0	3.4	1.3
Conductivity	uS/cm	1		59	215	248	60	131
Calculated Parameters								
Anion Sum	me/L	N/A		0.96	1.72	2.02	0.45	1.18
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		6	ND	ND	ND	ND
Calculated TDS	mg/L	1		58	106	132	27	75
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.05	1.99	2.62	0.48	1.39
Hardness (CaCO ₃)	mg/L	1		15	26	36	8	17
Ion Balance (% Difference)	%	N/A		4.70	7.30	12.80	3.30	8.00

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level[†]	McCABE LAKE	MCINTOSH RUN at Mouth	MCINTOSH RUN at ROACHES POND	MOODY LAKE	NINE MILE RIVER AT HWY 103
Community				Lucasville	Herring Cove	Spryfield	Williamswood	Timberlea
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 10:30	20/04/2011 15:50	20/04/2011 15:20	15/04/2011 11:45	19/04/2011 15:20
Langelier Index (@ 20C)	N/A	N/A		-3.23	-7.47	-6.90	-8.63	-7.33
Langelier Index (@ 4C)	N/A	N/A		-3.55	-7.79	-7.22	-8.95	-7.65
Saturation pH (@ 20C)	N/A	N/A		10.13	13.67	13.50	14.23	13.83
Saturation pH (@ 4C)	N/A	N/A		10.45	13.99	13.82	14.55	14.15
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		2.0	8.3	12.5	2.0	5.6
Total Copper (Cu)	µg/L	2		ND	ND	ND	ND	ND
Total Iron (Fe)	µg/L	50		171	250	329	277	177
Total Magnesium (Mg)	mg/L	0.1		0.6	1.3	1.2	0.6	0.8
Total Manganese (Mn)	µg/L	2		50	28	45	30	35
Total Potassium (K)	mg/L	0.1		0.5	0.9	0.9	0.5	1.0
Total Sodium (Na)	mg/L	0.1		6.9	32.2	42.0	6.2	22.4
Total Zinc (Zn)	µg/L	5		ND	95	33	7	16
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		131	308	1550	120	435
Total Coliform Outlet	MPN/100mL	2		128	--	--	>2420	--
E. Coli Lake	MPN/100mL	2		ND	4	49	1	ND
E. Coli Outlet	MPN/100mL	2		ND	--	--	2	--
Chlorophyll A - Acidification method	µg/L	N/A		2.03	2.04	1.31	2.57	2.69
Chlorophyll A - Welschmeyer method	µg/L	N/A		1.70	1.99	1.20	2.44	2.49

Notes:

- | | |
|--------------------------------|---------------------------------|
| -- Not Analysed | Russell Lake - sampled by JWL |
| NC Not Calculable | Morris Lake - sampled by JWL |
| ND Not Detected | |
| N/A Not Applicable | CCME - Canadian Council of M |
| MPN Most Probable Number | Fecal Coliform Guideline: for C |
| RDL Reportable Detection Limit | Dissolved Oxygen Guideline: Ic |

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level [†]	McCABE LAKE	MCINTOSH RUN at Mouth	MCINTOSH RUN at ROACHES POND	MOODY LAKE	NINE MILE RIVER AT HWY 103
Community				Lucasville	Herring Cove	Spryfield	Williamswood	Timberlea
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 10:30	20/04/2011 15:50	20/04/2011 15:20	15/04/2011 11:45	19/04/2011 15:20

ug Micrograms Bacterial level of concern for s

mg Milligrams Bacterial level unsuitable for s

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

* Records marked * indicate that the main watercourse sample was collected earlier th

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	NINE MILE RIVER AT MOUTH	PAPER MILL LAKE²	PORTERS LAKE, UPPER	RED BRIDGE POND	SACKVILLE RIVER³
Community				Shad Bay	Bedford	Porters Lake	Dartmouth	Bedford
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 14:15	13/05/2011 13:00	08/04/2011 9:50	14/04/2010 8:50	19/04/2011 8:40
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		ND	6	ND	35	6
Dissolved Chloride (Cl)	mg/L	1		426	39	392	263	25
Colour	TCU	5		70	54	63	ND	35
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.8	--	ND	0.4	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.17	0.49	0.09	ND	0.09
Nitrate (N)	mg/L	0.05		0.17	0.49	0.09	ND	0.09
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	0.06	ND	ND
Total Organic Carbon (C)	mg/L	0.5		8.0	6.5	8.5	3.6	5.1
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	6.6	6.4	6.3	7.7	6.9
Total Phosphorus (1M depth)	mg/L	0.002		0.018	ND	0.009	0.019	0.013
Reactive Silica (SiO ₂)	mg/L	0.5		2.4	4.5	3.0	ND	2.8
Total Suspended Solids	mg/L	5		ND	ND	ND	5	ND
Dissolved Sulphate (SO ₄)	mg/L	2		57	13	55	26	6
Turbidity	NTU	0.1		1.4	0.4	0.8	2.9	2.8
Conductivity	uS/cm	1		1470	170	1370	1000	109
Calculated Parameters								
Anion Sum	me/L	N/A		13.20	1.51	12.19	8.65	0.96
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	6	ND	35	6
Calculated TDS	mg/L	1		745	93	663	495	58
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		12.26	1.40	10.16	8.24	1.05
Hardness (CaCO ₃)	mg/L	1		129	14	111	73	15
Ion Balance (% Difference)	%	N/A		3.70	3.78	9.10	2.50	4.70

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level[†]	NINE MILE RIVER AT MOUTH	PAPER MILL LAKE²	PORTERS LAKE, UPPER	RED BRIDGE POND	SACKVILLE RIVER³
Community				Shad Bay	Bedford	Porters Lake	Dartmouth	Bedford
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 14:15	13/05/2011 13:00	08/04/2011 9:50	14/04/2010 8:50	19/04/2011 8:40
Langelier Index (@ 20C)	N/A	N/A		-7.00	-3.57	-6.38	-1.00	-3.23
Langelier Index (@ 4C)	N/A	N/A		-7.32	-3.82	-6.70	-1.32	-3.55
Saturation pH (@ 20C)	N/A	N/A		13.60	9.93	12.68	8.70	10.13
Saturation pH (@ 4C)	N/A	N/A		13.92	10.20	13.00	9.02	10.45
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		11.9	4.5	9.7	25.8	4.5
Total Copper (Cu)	µg/L	2		ND	ND	ND	ND	ND
Total Iron (Fe)	µg/L	50		186	140	209	385	332
Total Magnesium (Mg)	mg/L	0.1		24.0	0.6	21.1	2.1	0.9
Total Manganese (Mn)	µg/L	2		15	17	50	66	68
Total Potassium (K)	mg/L	0.1		7.8	0.9	7.2	2.1	0.8
Total Sodium (Na)	mg/L	0.1		217.0	25.0	177.0	154.0	15.8
Total Zinc (Zn)	µg/L	5		17	8	6	8	8
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		435	200	68	325	435
Total Coliform Outlet	MPN/100mL	2		--	--	--	249	488
E. Coli Lake	MPN/100mL	2		ND	33	ND	1	20
E. Coli Outlet	MPN/100mL	2		--	--	--	ND	11
Chlorophyll A - Acidification method	µg/L	N/A		7.83	0.62	0.41	11.56	1.73
Chlorophyll A - Welschmeyer method	µg/L	N/A		7.22	0.64	0.41	11.41	1.49

Notes:

- | | |
|--------------------------------|---------------------------------|
| -- Not Analysed | Russell Lake - sampled by JWL |
| NC Not Calculable | Morris Lake - sampled by JWL |
| ND Not Detected | |
| N/A Not Applicable | CCME - Canadian Council of M |
| MPN Most Probable Number | Fecal Coliform Guideline: for C |
| RDL Reportable Detection Limit | Dissolved Oxygen Guideline: Ic |

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level [†]	NINE MILE RIVER AT MOUTH	PAPER MILL LAKE ²	PORTERS LAKE, UPPER	RED BRIDGE POND	SACKVILLE RIVER ³
Community				Shad Bay	Bedford	Porters Lake	Dartmouth	Bedford
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 14:15	13/05/2011 13:00	08/04/2011 9:50	14/04/2010 8:50	19/04/2011 8:40

ug Micrograms

mg Milligrams

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

Bacterial level of concern for s

Bacterial level unsuitable for s

* Records marked * indicate that the main watercourse sample was collected earlier th

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See [NOTES](#) below

Spring 2011	Units	RDL	CCME Guideline Level[†]	SANDY LAKE GLEN ARBOUR	SHELDRAKE LAKE	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE
Community				Glen Arbour	Hubley	Dartmouth	Middle Sackville	Upper Tantallon
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 11:30	20/04/2011 10:00	13/04/2011 8:25	15/04/2011 9:35	19/04/2011 13:10
INORGANICS								
Total Alkalinity (Total as CaCO ₃)	mg/L	5		6	ND	11	6	ND
Dissolved Chloride (Cl)	mg/L	1		14	50	39	23	16
Colour	TCU	5		13	43	76	16	32
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		0.9	2.4	0.5	ND	ND
Nitrate + Nitrite	mg/L	0.05	13000	0.07	0.05	0.21	0.11	0.05
Nitrate (N)	mg/L	0.05		0.07	0.05	0.21	0.11	0.05
Nitrite (N)	mg/L	0.05		ND	ND	ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		3.4	6.6	9.8	3.9	6.2
Orthophosphate (P)	mg/L	0.01		ND	ND	ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	7.0	5.8	7.1	7.1	5.7
Total Phosphorus (1M depth)	mg/L	0.002		0.008	0.020	0.008	0.010	0.008
Reactive Silica (SiO ₂)	mg/L	0.5		2.4	2.4	3.2	2.4	3.4
Total Suspended Solids	mg/L	5		ND	ND	ND	ND	ND
Dissolved Sulphate (SO ₄)	mg/L	2		4	5	10	8	3
Turbidity	NTU	0.1		1.3	1.3	0.8	2.0	1.1
Conductivity	uS/cm	1		52	188	179	111	67
Calculated Parameters								
Anion Sum	me/L	N/A		0.60	1.52	1.54	0.94	0.52
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		6	ND	11	6	ND
Calculated TDS	mg/L	1		46	94	92	56	32
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND	ND	ND
Cation Sum	me/L	N/A		1.18	1.77	1.64	0.95	0.57
Hardness (CaCO ₃)	mg/L	1		44	24	31	17	7
Ion Balance (% Difference)	%	N/A		32.30	7.60	3.10	0.70	5.20

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level[†]	SANDY LAKE GLEN ARBOUR	SHELDRAKE LAKE	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE
Community				Glen Arbour	Hubley	Dartmouth	Middle Sackville	Upper Tantallon
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 11:30	20/04/2011 10:00	13/04/2011 8:25	15/04/2011 9:35	19/04/2011 13:10
Langelier Index (@ 20C)	N/A	N/A		-2.58	-7.89	-2.44	-2.98	-9.58
Langelier Index (@ 4C)	N/A	N/A		-2.90	-8.21	-2.76	-3.30	-9.90
Saturation pH (@ 20C)	N/A	N/A		9.58	13.69	9.54	10.08	15.28
Saturation pH (@ 4C)	N/A	N/A		9.90	14.01	9.86	10.40	15.60
Metals (ICP-MS)								
Total Calcium (Ca)	mg/L	0.1		15.6	7.8	10.0	5.0	1.8
Total Copper (Cu)	µg/L	2		ND	ND	ND	ND	ND
Total Iron (Fe)	µg/L	50		312	201	241	243	204
Total Magnesium (Mg)	mg/L	0.1		1.2	1.1	1.4	1.0	0.6
Total Manganese (Mn)	µg/L	2		54	79	33	34	38
Total Potassium (K)	mg/L	0.1		1.0	0.9	0.9	0.8	0.5
Total Sodium (Na)	mg/L	0.1		5.3	28.2	22.4	13.3	8.9
Total Zinc (Zn)	µg/L	5		187	48	18	5	7
MICROBIOLOGICAL								
Total Coliform Lake	MPN/100mL	2		162	308	214	77	23
Total Coliform Outlet	MPN/100mL	2		328	291	--	119	32
E. Coli Lake	MPN/100mL	2		ND	3	2	1	ND
E. Coli Outlet	MPN/100mL	2		ND	1	--	ND	ND
Chlorophyll A - Acidification method	µg/L	N/A		5.52	3.29	0.39	1.82	1.86
Chlorophyll A - Welschmeyer method	µg/L	N/A		4.96	3.31	0.36	1.56	1.57

Notes:

-- Not Analysed
 NC Not Calculable
 ND Not Detected

N/A Not Applicable

MPN Most Probable Number

RDL Reportable Detection Limit

Russell Lake - sampled by JWL

Morris Lake - sampled by JWL

CCME - Canadian Council of M

Fecal Coliform Guideline: for C

Dissolved Oxygen Guideline: Ic

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level [†]	SANDY LAKE GLEN ARBOUR	SHELDRAKE LAKE	SMELT BROOK	SPRINGFIELD LAKE	STILLWATER LAKE
Community				Glen Arbour	Hubley	Dartmouth	Middle Sackville	Upper Tantallon
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			19/04/2011 11:30	20/04/2011 10:00	13/04/2011 8:25	15/04/2011 9:35	19/04/2011 13:10

ug Micrograms Bacterial level of concern for s

mg Milligrams Bacterial level unsuitable for s

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

* Records marked * indicate that the main watercourse sample was collected earlier th

HRM Water Quality Monitoring Program Results - Spring 2011

WATER QUALITY ANALYSES - HRM LAKE SAMPLING PROGRAM

See **NOTES** below

Spring 2011	Units	RDL	CCME Guideline Level[†]	THE MILL POND (THREE MILE POND)	TUCKER LAKE	WHYNDER (WINDER) LAKE
Community				Timberlea	Beaverbank	North Preston
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			20/04/2011 12:30	14/11/2011 13:15	14/04/2011 10:00
INORGANICS						
Total Alkalinity (Total as CaCO ₃)	mg/L	5		ND	16	20
Dissolved Chloride (Cl)	mg/L	1		18	51	65
Colour	TCU	5		53	16	10
Total Kjeldahl Nitrogen (TKN)	mg/L	0.4		ND	0.6	1.4
Nitrate + Nitrite	mg/L	0.05	13000	ND	0.06	1.54
Nitrate (N)	mg/L	0.05		ND	0.06	1.54
Nitrite (N)	mg/L	0.05		ND	ND	ND
Nitrogen (Ammonia Nitrogen)	mg/L	0.05	19	ND	ND	ND
Total Organic Carbon (C)	mg/L	0.5		7.3	4.6	4.8
Orthophosphate (P)	mg/L	0.01		ND	ND	ND
pH (Lab)	pH	N/A	6.5-9.0	6.0	7.4	7.5
Total Phosphorus (1M depth)	mg/L	0.002		0.011	0.008	0.042
Reactive Silica (SiO ₂)	mg/L	0.5		2.9	2.1	1.3
Total Suspended Solids	mg/L	5		ND	ND	ND
Dissolved Sulphate (SO ₄)	mg/L	2		4	8	19
Turbidity	NTU	0.1		1.1	1.2	1.1
Conductivity	uS/cm	1		74	227	316
Calculated Parameters						
Anion Sum	me/L	N/A		0.59	1.93	2.74
Bicarb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	16	20
Calculated TDS	mg/L	1		39	109	161
Carb. Alkalinity (calc. as CaCO ₃)	mg/L	1		ND	ND	ND
Cation Sum	me/L	N/A		0.82	1.86	2.62
Hardness (CaCO ₃)	mg/L	1		18	34	36
Ion Balance (% Difference)	%	N/A		16.10	1.90	2.10

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level†	THE MILL POND (THREE MILE POND)	TUCKER LAKE	WHYNDER (WINDER) LAKE
Community				Timberlea	Beaverbank	North Preston
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			20/04/2011 12:30	14/11/2011 13:15	14/04/2011 10:00
Langelier Index (@ 20C)	N/A	N/A		-7.75	-1.94	-1.71
Langelier Index (@ 4C)	N/A	N/A		-8.07	-2.26	-2.03
Saturation pH (@ 20C)	N/A	N/A		13.75	9.34	9.21
Saturation pH (@ 4C)	N/A	N/A		14.07	9.66	9.53
Metals (ICP-MS)						
Total Calcium (Ca)	mg/L	0.1		6.2	11.1	12.4
Total Copper (Cu)	µg/L	2		ND	ND	2
Total Iron (Fe)	µg/L	50		173	101	98
Total Magnesium (Mg)	mg/L	0.1		0.7	1.4	1.1
Total Manganese (Mn)	µg/L	2		32	23	31
Total Potassium (K)	mg/L	0.1		0.8	1.4	2.8
Total Sodium (Na)	mg/L	0.1		9.1	26.2	42.1
Total Zinc (Zn)	µg/L	5		47	ND	11
MICROBIOLOGICAL						
Total Coliform Lake	MPN/100mL	2		248	34	58
Total Coliform Outlet	MPN/100mL	2		326	133	37
E. Coli Lake	MPN/100mL	2		9	ND	ND
E. Coli Outlet	MPN/100mL	2		1	2	ND
Chlorophyll A - Acidification method	µg/L	N/A		3.62	3.25	48.35
Chlorophyll A - Welschmeyer method	µg/L	N/A		3.54	3.10	44.90

Notes:

- | | |
|--------------------------------|---------------------------------|
| -- Not Analysed | Russell Lake - sampled by JWL |
| NC Not Calculable | Morris Lake - sampled by JWL |
| ND Not Detected | |
| N/A Not Applicable | CCME - Canadian Council of M |
| MPN Most Probable Number | Fecal Coliform Guideline: for C |
| RDL Reportable Detection Limit | Dissolved Oxygen Guideline: Ic |

HRM Water Quality Monitoring Program Results - Spring 2011

Spring 2011	Units	RDL	CCME Guideline Level [†]	THE MILL POND (THREE MILE POND)	TUCKER LAKE	WHYNDER (WINDER) LAKE
Community				Timberlea	Beaverbank	North Preston
Sampling Date & Time* (DD/MM/YYYY HH:MM)	DD/MM/YYYY 24hr time			20/04/2011 12:30	14/11/2011 13:15	14/04/2011 10:00

ug Micrograms

mg Milligrams

L Litre

[†] Recreational Water Quality Guidelines

¹ Taken from South East end of Lake

² Taken from South West end of Lake

³ 'Lake' = @ mouth; 'Outlet' = Hwy 102;

Bacterial level of concern for s

Bacterial level unsuitable for s

* Records marked * indicate that the main watercourse sample was collected earlier th