Darrin Fresh Water Institute

AT LAKE GEORGE

LAKE GEORGE
COLIFORM MONITORING PROGRAM – 2006
FINAL INTERIM REPORT

prepared for
The FUND for Lake George
By

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Lake George Coliform Monitoring Program

The Coliform Monitoring Program focuses on a series of locations that have shown chronically high levels of coliform bacteria in past years with routine surveillance sampling of other locations also included. For 2006, synoptic sampling of public bathing beaches on a two week basis was also included in the program. In addition to samples collected at the lake-shore, a series of samples are collected up the watershed by the Lake George Park Commission to locate and remediate specific sources of bacterial pollution.

Follow-up investigations by the Lake George Park Commission, NYS Department of Health and county and local government personnel are conducted at sites with elevated fecal coliform levels.

Action Levels of the Fund for Lake George Coliform Monitoring Program

In order to respond effectively to contamination problems detected during the Fund for Lake George Coliform Monitoring Program, the following actions will occur:

1. If 200 or more fecal coliform bacteria per 100 milliliters are reported, the site will be resampled during the next sampling cycle.

2. If 400 or more fecal coliform bacteria per 100 milliliters are reported, the site will be resampled within 24 to 48 hours. The data for both samples will be reported to the LGPC. They will accept responsibility for contacting the appropriate regulatory agencies.

Follow-up samples to locate specific shoreline problems are not within the guidelines of this program and will be the responsibility of the appropriate regulatory agencies. The Darrin Fresh Water Institute will provide technical assistance upon request, however the cost of additional sampling and analysis must be covered by the local, county or state agency responsible for water quality complaints.

SUGGESTIONS FOR INTERPRETATION OF COLIFORM DATA

The Lake George Coliform Monitoring Program collects water samples from suspected contamination sources throughout the Lake George basin. Three primary measurements are then made for each sample; Total Coliform (TC), Fecal Coliform (FC) and Fecal Streptococcus (FS) Bacteria. These bacteria serve as indicators of the presence of animal or human waste. The presence of elevated levels of these bacteria indicate that potentially disease-causing protozoans, bacteria and other microorganisms may be present in the water.

New York State Department of Health has determined maximum allowable bacterial levels for contact recreation (swimming, wading, etc.). A table of these bacterial concentrations is included. When these maximum bacterial levels are exceeded, the New York State Department of Health is empowered to close the location to bathing until the problem or problems are corrected. These levels are used by the Fresh Water Institute to determine appropriate responses to various bacterial concentrations found during sampling. A table of these responses is included.

Interpretation of data to determine and locate sources of contamination (human or other warm-blooded animal) requires more than just current bacterial levels. A knowledge of past history of the site, weather, geology of the area, drainage patterns, and some information on human activities in the area are also necessary. To differentiate between human waste and that produced by other warm-blooded animals, it is sometimes helpful to refer to the ratio of fecal coliform to fecal streptococcus bacteria (FC/FS). An FC/FS ratio of 4 or greater is generally considered indicative of contamination of human origin.

New York State coliform bacteria standards for bathing beaches.

Maximum Allowable Levels of Coliform Bacteria in Waters Used for Contact Recreation (NYS Dept. of Health)		
Bacterial Test	**Max. 5 Sample Mean**	**Max. Single Result**
Total Coliform	**2400 per 100 mls**	**5000 per 100 mls**
Fecal Coliform	**200 per 100 mls**	**1000 per 100 mls**

Summary

The Coliform Monitoring Program for 2006 focused on a series of locations that have shown chronically high levels of coliform bacteria in past years. In addition to routine surveillance sampling, more intensive sample collection was conducted in the Huletts Landing area, coordinated with a citizens group and the Lake George Park Commission. In-lake sample collection occurred weekly from the first week in July and concluded the first week in September, 2006. Follow-up sampling was conducted within 48 hours for any samples exceeding contact recreation standards. Adjacent public swimming areas were sampled with any follow-up sampling effort. Sampling sites were chosen in consultation with the LGPC, DEC, other regulatory agencies and citizens groups. A percentage of DFWI sampling effort was dedicated to assist the Lake George Park Commission with location of coliform sources, working closely with the Park Commission and local authorities to locate and correct sources of contamination.

In 1993 the New York State Department of Health issued new guidelines for public safety at bathing facilities. Included in these guidelines was mandatory testing of coliform bacterial levels at all public bathing beaches. Public outcry related to the cost to implement these regulations resulted in a lack of enforcement of the new rules by the New York State Department of Health. While not enforced, these rules still represent a program of appropriate assessment of the safety of public bathing facilities. With the lack of enforcement of these regulations, only the NYS DEC operated bathing beaches in the Lake George basin are routinely tested by NYS for coliform bacterial levels. From 1993 through 1997, the DFWI conducted a bathing beach testing program sponsored by the FUND. We removed this program from the 1998 proposal, not because it had no merit, but because we had a number of other projects, which we felt required the monetary support more. This program however still represents a low cost mechanism to provide minimum assurances that the public beaches within the Lake George basin pose no threats to the bathing public. Furthermore, it

provides both the FUND and the DFWI with considerable public presence. In 2002, the bathing beach testing program was reinstituted, with all beaches producing bacterial levels with acceptable limits during the past 5 years.

In 2006, 177 samples were collected from 71 sites located throughout the Lake George basin. Eight sites with a total of 14 samples (8%) were found to contain fecal coliform levels above the average level that New York State considers acceptable for contact recreation (swimming & wading). Five samples from 5 sites exceeded single sample limits for contact recreation. One of these samples was from a motel bathing beach, however multiple resamples failed to produce additional elevated levels of bacteria. Two samples from 2 sites exceeding single or average sample limits occurred during the 50-year-storm which struck Bolton Landing in June. Excessive bacterial levels are commonly associated with massive loading of suspended sediments as a result of major stormwater runoff episodes. Two sites dominated the list including the Marine Village Culvert and South Sawmill Bay Brook. These two locations were responsible for 43% of the samples exceeding contact recreation standards (6 of the 14 samples). Follow-up investigations by the Lake George Park Commission, NYS Department of Health and county and local government personnel were conducted at both of these locations. Investigations, however, failed to locate specific sources of contamination.

Definitions

TC – Total Coliform Bacteria
FC – Fecal Coliform Bacteria
FS – Fecal Streptococcus Bacteria
FC/FS – Ratio of Fecal Coliform to Fecal Streptococcus Bacteria
TNTC – Too Numerous to Count
MAT – Confluent growth of non-target bacteria
? – High background, referring to non-target growth of bacteria interfering with counts of target bacteria
LT – Less than
LA – Laboratory accident preventing enumeration of bacteria

2006 LAKE GEORGE COLIFORM MONITORING PROGRAM

major storm event sampling

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Bolton					
Basin Bay Brook	17-Jul-06	580	66	93	0.7	Cold, clear
Bixby Beach	17-Jul-06	41	8	6	1.3	Massive algae growth
Braley Point Brook	31-Jul-06	710	43	77	0.6	Cool, low flow
Finkle Brook	26-Jan-06	33	1	2	0.5	clear, anchor ice, moderate flow
Finkle Brook	21-Mar-06	39				media failed
Finkle Brook	17-May-06	280	40	12	3.3	clear, cold
Finkle Brook	05-Jul-06	310	64	45	1.4	Moderate flow, cool, clear
Finkle Brook	28-Aug-06	770	47	197	0.2	low flow, cool, clear
Finkle Brook	27-Dec-07	180	lt 10			
Glen Island	07-Aug-06	4	3	8	0.4	No boats, warm
Huddle Brook	05-Jul-06	76	30	57	0.5	Clear, low flow, brown
Huddle Brook	28-Aug-06	400	35	79	0.4	Moderate flow, cool, clear, geese feathers
Middleworth Bay - South	05-Jul-06	860	111	86	1.3	Low flow, clear, cold, beaver activity
Middleworth Bay - South	28-Aug-06	1600	55	92	0.6	Good flow, cold, clear
Rogers Memorial Beach	05-Jul-06	15	18			Many bathers, warm
Rogers Memorial Beach	17-Jul-06	60	56			Many bathers
Rogers Memorial Beach	31-Jul-06	28	14			Warm, no bathers, algae
Rogers Memorial Beach	14-Aug-06	56	46			warm, turbid, many bathers
Rogers Memorial Beach	28-Aug-06	8	4			No bathers, warm, clear
S. Sawmill Bay Brook near lake	30-Aug-06	1010	720	450	1.6	warm, grey
South Sawmill Bay Brook	28-Jun-06	3100	620	1080	0.6	Moderate flow, slightly turbid, brown floc
South Sawmill Bay Brook	05-Jul-06	540	123	154	0.8	Very low flow, cool
South Sawmill Bay Brook	14-Aug-06	810	104	168	0.6	cold, clear, low flow
South Sawmill Bay Brook	28-Aug-06	1280	350	211	1.7	low flow, cool, slightly turbid (gray)
South Sawmill Bay Brook	30-Aug-06	770	410	450	0.9	moderate flow, clear
Stewart Brook	31-Jul-06	160	14	19	0.7	Good flow, warm

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Bolton (cont.)					
Veterans Park Beach	05-Jul-06	450	140			Lots of bathers
Veterans Park Beach	17-Jul-06	340	200			Many bathers
Veterans Park Beach	31-Jul-06	100	42			4 geese, warm, calm
Veterans Park Beach	14-Aug-06	80	10			warm, turbid, many bathers
Veterans Park Beach	28-Aug-06	3	2			Bathers, cool, clear
Veteran's Park Beach - So. Culvert	31-Jul-06	150	90	48	1.9	Low flow, new culvert pipe, odor
	Town of Dresden					
Beach in front of Cook Bay Loop	06-Sep-06	55	4	73	0.1	little fishes, cool and clear
Bluff Head Creek	25-Jul-06	390	25	40	0.6	Cold, clear, good flow
Commission Point	07-Aug-06	8	1	4	0.3	No people, warm, clear
Cook Bay Culvert	10-Jul-06	73	5	11	0.5	Low flow, clear, warm
Cook Bay Loop	07-Aug-06	980	250	430	0.6	Very low flow
Cook Bay Loop	21-Aug-06	540	240	74	3.2	low flow, cold, clear
Cook Bay Loop	05-Sep-06	3240	2790	210	13.3	almost no flow, sulfur smell
Cook Bay Loop	06-Sep-06	26800	425	200	2.1	slight sulfur smell, very low flow
Cook Bay South Culvert	10-Jul-06	630	105	60	1.8	Cool, clear, moderate flow
Cook Bay South Culvert	07-Aug-06	870	125	80	1.6	Cool, clear, good flow
Foster Brook	10-Jul-06	118	7	19	0.4	Cold, good flow
Foster Brook	07-Aug-06	380	37	75	0.5	Cold, clear, good flow
Foster Brook	05-Sep-06	27	9	40	0.2	cold, clear, moderate flow
Indian Bay Brook	10-Jul-06	80	5	28	0.2	Cool, clear, good flow
Indian Bay Brook	07-Aug-06	600	2	39	0.1	Cool, clear, good flow
Marina Way Brook	10-Jul-06	330	25	60	0.4	Low flow
Marina Way Brook	07-Aug-06	780	28	67	0.4	Cold, good flow
Paradise Bay	07-Aug-06	11	4	2	2.0	No people, warm, clear
Stream next to Cook Bay Loop	06-Sep-06	1560	118	270	0.4	good flow, cold and clear
Sunset Bay Brook East	10-Jul-06	200	109	69	1.6	Cool, clear, good flow

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Dresden (cont.)					
Sunset Bay Brook East	07-Aug-06	810	89	490	0.2	low flow, lots of leaf debris
Sunset Bay Brook East	05-Sep-06	55	20	25	0.8	turbid, low flow
Sunset Bay Brook West	10-Jul-06	188	102	44	2.3	Cold, clear, mod. Flow, many ducks
Sunset Bay Brook West	07-Aug-06	300	42	61	0.7	Low flow, cold, clear
Sunset Bay Brook West	05-Sep-06	60	24	182	0.1	lots of feathers and droppings, cold, moderate flow
Washington County Beach	10-Jul-06	450	360			Couple of bathers, warm, flock of geese
Washington County Beach	25-Jul-06	56	26			No bathers, many ducks, warm, clear water
Washington County Beach	07-Aug-06	90	47			No bathers, calm, warm, clear
Washington County Beach	21-Aug-06	47	10			warm, clear, no bathers
Washington County Beach	05-Sep-06	15	3			no dock, no bathers
Wyatt's Bay Culvert	10-Jul-06	170	43	47	0.9	Dead fish
Wyatt's Bay Culvert	21-Aug-06	260	69	71	1.0	no flow, warm
Wyatt's Bay Culvert	05-Sep-06	200	89	42	2.1	low flow, cool clear water
	Town Of Fort Ann					
Butternut Brook	31-Jul-06	6	2	2	1.0	Low flow
Echo Bay Culvert	31-Jul-06	30	23	26	0.9	Warm, numerous milfoil
Elizabeth Island Brook	31-Jul-06	190	24	16	1.5	Warm, low flow
Fort Ann Beach	05-Jul-06	15	8			No bathers, clear, high lake level
Fort Ann Beach	17-Jul-06	19	6			Warm, 4 bathers
Fort Ann Beach	31-Jul-06	17	24			No bathers, warm
Fort Ann Beach	14-Aug-06	12	14			warm, clear, no bathers
Fort Ann Beach	28-Aug-06	22	9			No bathers, cool, clear

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Hague					
Battle Hill Brook	25-Jul-06	17	2	6	0.3	Silty, cold, good flow
Cape Cod Village Brook	10-Jul-06	58	1	46	0.0	Geese droppings, moderate flow
Cooks Bay Culvert - North	25-Jul-06	1200	160	670	0.2	Murky green, moderate flow
Cooks Bay Culvert - North	21-Aug-06	670	152	116	1.3	no flow, algae
Cooks Bay Culvert - South	25-Jul-06	570	100	60	1.7	Murky, brown, good flow
Cooks Bay Culvert - South	21-Aug-06	740	30	172	0.2	good flow, algae
Hague Boat Launch Culvert	10-Jul-06	180	4	17	0.2	Mod. Flow, floating plants, clear, cool
Hague Boat Launch Culvert	21-Aug-06	190	18	150	0.1	clear, cool, low flow
Hague Boat Launch Culvert	05-Sep-06	270	37	65	0.6	Cool, good flow. Plant debris
Hague Brook	25-Jul-06	420	35	59	0.6	Good flow, cold, clear
Hague Brook	21-Aug-06	610	99	170	0.6	cool, clear, good flow
Hague Town Beach	10-Jul-06	340	14			No bathers, turbid, silty water, warm
Hague Town Beach	25-Jul-06	390	40			Bathers, warm turbid, lots of leaves
Hague Town Beach	07-Aug-06	250	50			1 bather, turbid, warm
Hague Town Beach	21-Aug-06	18	9			warm, clear, no bathers
Hague Town Beach	05-Sep-06	240	90			no bathers, cool, slightly turbid
North Friends Point Creek	22-Aug-06	2640	36	53	0.7	good flow, algae
Sabbath Day Point Beach	10-Jul-06	510	38			Silty by shore, clear, warm water
Sabbath Day Point Beach	25-Jul-06	140	40			Cool clear, no bathers
Sabbath Day Point Beach	07-Aug-06	100	23			Slightly turbid, no bathers, 1 duck
Sabbath Day Point Beach	21-Aug-06	70	15			warm, clear, no bathers
Sabbath Day Point Beach	05-Sep-06	9	2			no bathers, cool, clear
Sabbath Day Point Brook	21-Aug-06	64	2	43	0.0	warm, clear, low flow
Sabbath Day Point Brook	05-Sep-06	210	85	11	7.7	Warm, clear water, a bunch of ducks
Silver Bay Brook	25-Jul-06	620	64	125	0.5	Low flow, cold, clear
Temple Island Culvert	05-Sep-06	300	49	93	0.5	Cool, clear, great flow. North of Ruah B&B

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Lake George					
Diamond Point Beach	05-Jul-06	15	2			No bathers, lake level high
Diamond Point Beach	17-Jul-06	16	0			Warm, many bathers
Diamond Point Beach	31-Jul-06	22	14			No swimmers
Diamond Point Beach	14-Aug-06	37	4			warm, clear, no bathers
Diamond Point Beach	28-Aug-06	4	1			No bathers, cool, clear
East Brook	17-Jul-06	420	158	168	0.9	Low flow, cool, clear
East Brook	28-Aug-06	480	172	320	0.5	cold, turbid, green
English Brook	28-Aug-06	420	121	28	4.3	moderate flow, cold, clear, lots of seagulls
King James Spring	05-Jul-06	1100	500	162	3.1	Cold, moderate flow
King James Spring	06-Jul-06	750	158	114	1.4	Moderate flow, cool
King James Spring	17-Jul-06	230	47	12	3.9	Good flow, odor
King James Spring	14-Aug-06	8500	4620	147	31.4	cool, clear, good flow
King James Spring	15-Aug-06	860	38	87	0.4	cool, clear, good flow
King James Spring	28-Aug-06	640	260	380	0.7	good flow, cold, clear
Lake Avenue Beach	05-Jul-06	90	5	90	0.1	Clear, cool, calm
Lake Avenue Beach	17-Jul-06	330	18	14	1.3	Warm, calm
Lake Avenue Beach	31-Jul-06	580	96	47	2.0	Cool, calm
Lake Avenue Beach	14-Aug-06	10	2	lt 1		warm, clear, 2 bathers
Lake Avenue Beach - S. Culvert	28-Jun-06	10700	1540	4800	0.3	Moderate flow
Lake Avenue Beach - S. Culvert	05-Jul-06	500	10	170	0.1	Low flow, clear, cool
Lake Avenue Beach - S. Culvert	17-Jul-06	240	28	29	1.0	Cool, low flow, clear
Lake Avenue Beach - S. Culvert	31-Jul-06	1190	168	51	3.3	Good flow, cool
Lake Avenue Beach - S. Culvert	14-Aug-06	310	41	144	0.3	cold, clear, low flow
LG Water Treatment Plant Culvert	17-Jul-06	360	83	78	1.1	good flow, cool
Marine Village Beach	02-Aug-06	180	44			few bathers, cool, clear
Marine Village Beach	14-Aug-06	10	3	7	0.4	warm, clear, no bathers
Marine Village Beach	29-Aug-06	180	45	51	0.9	duck, warm, rain, no bathers
Marine Village Beach	30-Aug-06	340	470	24	19.6	warm, turbid, 6 bathers

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Lake George (cont.)					
Marine Village Culvert	05-Jul-06	600	197	99	2.0	Cold, debris, moderate flow
Marine Village Culvert	31-Jul-06	1340	440	62	7.1	Moderate flow, cold
Marine Village Culvert	01-Aug-06	3000	440	470	0.9	Resample, moderate flow, cold
Marine Village Culvert	02-Aug-06	4500	330	380	0.9	Resample #2, cool, moderate flow
Marine Village Culvert	14-Aug-06	1010	70	68	1.0	cold, clear, low flow
Marine Village Culvert	28-Aug-06	920	590	740	0.8	low flow, cool, clear, cigarette butts
Marine Village Culvert	29-Aug-06	14100	3500	1600	2.2	good flow, cool, rain
Marine Village Culvert	30-Aug-06	690	130	70	1.9	low flow, cool, clear
Shepard's Park Beach	05-Jul-06	46	3			No bathers, warm
Shepard's Park Beach	17-Jul-06	65	64			Many bathers, lots of debris
Shepard's Park Beach	31-Jul-06	61	38			A few bathers
Shepard's Park Beach	14-Aug-06	14	16			cool, clear, no bathers
Shepard's Park Beach	28-Aug-06	13	11			No bathers, cool, clear
Sheriffs Dock Culvert	05-Jul-06	350	197	4	49.3	Very low flow, warm
Sheriffs Dock Culvert	06-Jul-06	78	71	41	1.7	No apparent flow
Sheriffs Dock Culvert	14-Aug-06	100	10	10	1.0	clear, no flow
Smith Brook	17-Jul-06	440	20	40	0.5	Good flow, clear
Tea Island Culvert	17-Jul-06	210	40	39	1.0	Fishy smell, algae, cool, low flow
Villa Viola Beach	02-Aug-06	150	64			warm, clear
Villa Viola Beach	14-Aug-06	23	4	3	1.3	warm, clear, no bathers
Villa Viola Beach	29-Aug-06	16000	3120	2920	1.1	warm, rain, no bathers
Villa Viola Beach	30-Aug-06	250	110	20	5.5	warm, turbid, no bathers
West Brook	17-Jul-06	260	52	260	0.2	Moderate flow, cool ,algae

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Putnam					
Glenburnie Culvert	21-Aug-06	360	19	62	0.3	no flow, warm, sediment
Gull Bay Brook	25-Jul-06	470	25	560	0.0	Good flow, cold, clear
Gull Bay Brook	05-Sep-06	730	65	99	0.7	Good flow, cool, clear water
Putnam Town Beach	10-Jul-06	8	4			No bathers, 1 duck, cool water
Putnam Town Beach	25-Jul-06	10	6			No bathers, no ducks, cool, clear
Putnam Town Beach	07-Aug-06	3	2			No bathers, warm, clear
Putnam Town Beach	21-Aug-06	24	3			warm, clear, no bathers, calm
Putnam Town Beach	05-Sep-06	6	2			No bathers, cool, clear
Sucker Brook	25-Jul-06	260	46	600	0.1	Water coffee color, cool
Sucker Brook	05-Sep-06	102	11	17	0.6	Cold, Clear, low flow
	Town of Queensbury					
Assembly Point Culvert	14-Aug-06	160	64	69	0.9	turbid, heavy algae & plant growth
Dunhams Bay @ Route 9L	14-Aug-06	47	18	19	0.9	warm, brown water
Harris Bay Culvert	05-Jul-06	91	28	145	0.2	Warm, low flow
Harris Bay Culvert	31-Jul-06	180	27	21	1.3	Low flow
Joshua Rock Brook	14-Aug-06	150	7	8	0.9	cold, clear, moderate flow
Speaker Heck Island	28-Aug-06	4	1	1	1.0	bird droppings, no bathers
Warner Bay Culvert	31-Jul-06	30	3	3	1.0	No flow
Warner Bay Culvert	28-Aug-06	250	4	15	0.3	no flow, cool, clear

SITE	DATE	TC/100mls	FC/100mls	FS/100mls	FC/FS	NOTES
	Town of Ticonderoga					
Howe's Landing Culvert	25-Jul-06	660	18	111	0.2	Cold, clear, good flow
Howe's Landing Culvert	21-Aug-06	800	78	340	0.2	Good flow, cold, clear
Mossy Point Boat Launch	25-Jul-06	130	20	2	10.0	Green, lots of milfoil, boaters
Ticonderoga Town Beach	10-Jul-06	18	5			No bathers, warm water, clear
Ticonderoga Town Beach	25-Jul-06	21	10			3 bathers, cool water, clear
Ticonderoga Town Beach	07-Aug-06	111	60			Many bathers warm, slightly turbid
Ticonderoga Town Beach	21-Aug-06	48	39			warm, clear, no bathers
Ticonderoga Town Beach	05-Sep-06	51	56			no bathers, cool, clear
Tiroga Point Channel	25-Jul-06	64	21	36	0.6	Dark green, murky, many plants