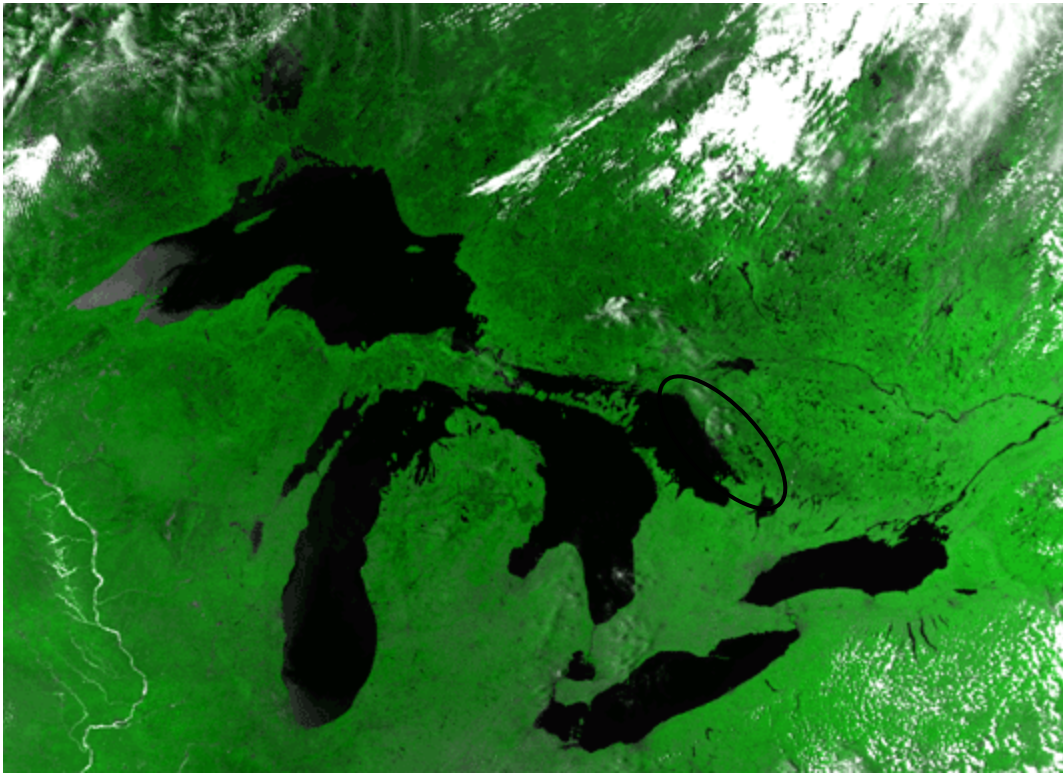


Volunteer Water Quality Monitoring Program Data Report – 2006



**Township of The Archipelago
April, 2007**

Acknowledgements

This monitoring program represents a successful partnership between the Township of The Archipelago, cottager associations, and numerous volunteers in areas along the coast and inland lakes. The volunteer-based program provides an important avenue for relaying information about our environment to ratepayers and for providing valuable information to the Township.

Considerable thanks are to be extended to all the volunteers who commit significant energy toward the success of this program. The volunteers offer their valuable time, boats, “laboratory space” and much more to help ensure we understand potential changes to our environment. The Township is very appreciative of your commitment.

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Area Data

Sturgeon Bay

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1.0 Introduction

This report provides the summary of results from the 2006 Water Quality Monitoring Program for the Township of The Archipelago. The program purpose, rationale, and methods have been presented in previous year's reports and were followed for the 2006 season. Similar to the past two season's report, the purpose of this report is to present the data gathered in the 2006 sampling season. In future years, a multi-year analysis will be necessary to evaluate trends in water quality. It should be noted that this report was created by Township of The Archipelago staff and no analysis or review is provided internally.

The Township is very committed to addressing environmental issues and ensuring the maintenance of the high quality environment we all enjoy. This philosophy is integrated into the day to day functioning of the municipality from public works operations to detailed planning analysis.

2.0 Results

The following results were tabulated from data gathered in 2005. Different locations were sampled with different intensity and for varying lengths of time. It is not the purpose of this report to provide analysis or draw conclusions from the data. Rather, what is provided are:

- outlines of the standards against which data can be compared; and
- tables outlining the different data sets and averages for each location for each sample area; and where possible, the averages from the previous sampling years.

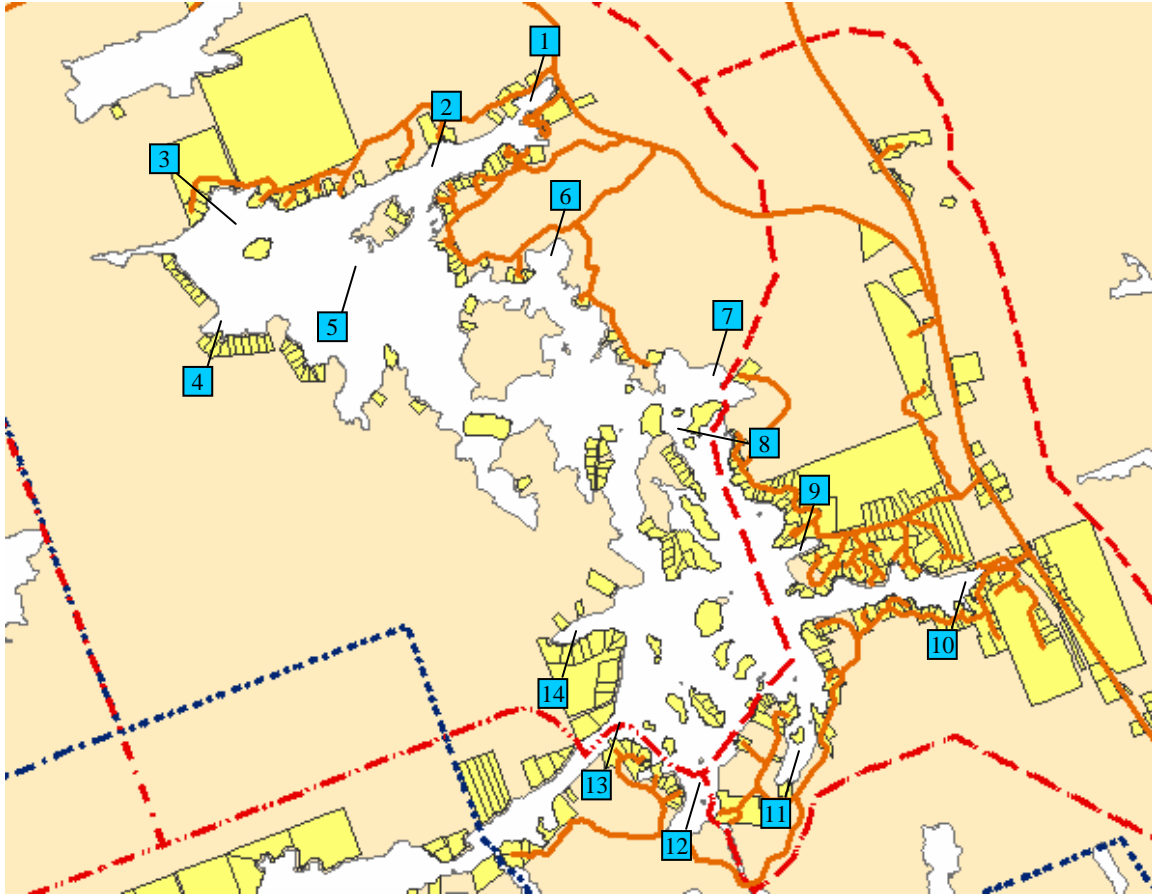
It should be noted that in order to assess the relevance of the data, comparisons should be made between averages and standard deviations (not individual data points per se), previous year averages and against established standards.

Charts are provided comparing water quality in the inland lakes, open bay sampling areas, and back bay sampling areas. When reviewing these data please keep in mind similarities and differences in the surrounding ecosystem and potential differences in sampling methodology (i.e. sampling times).

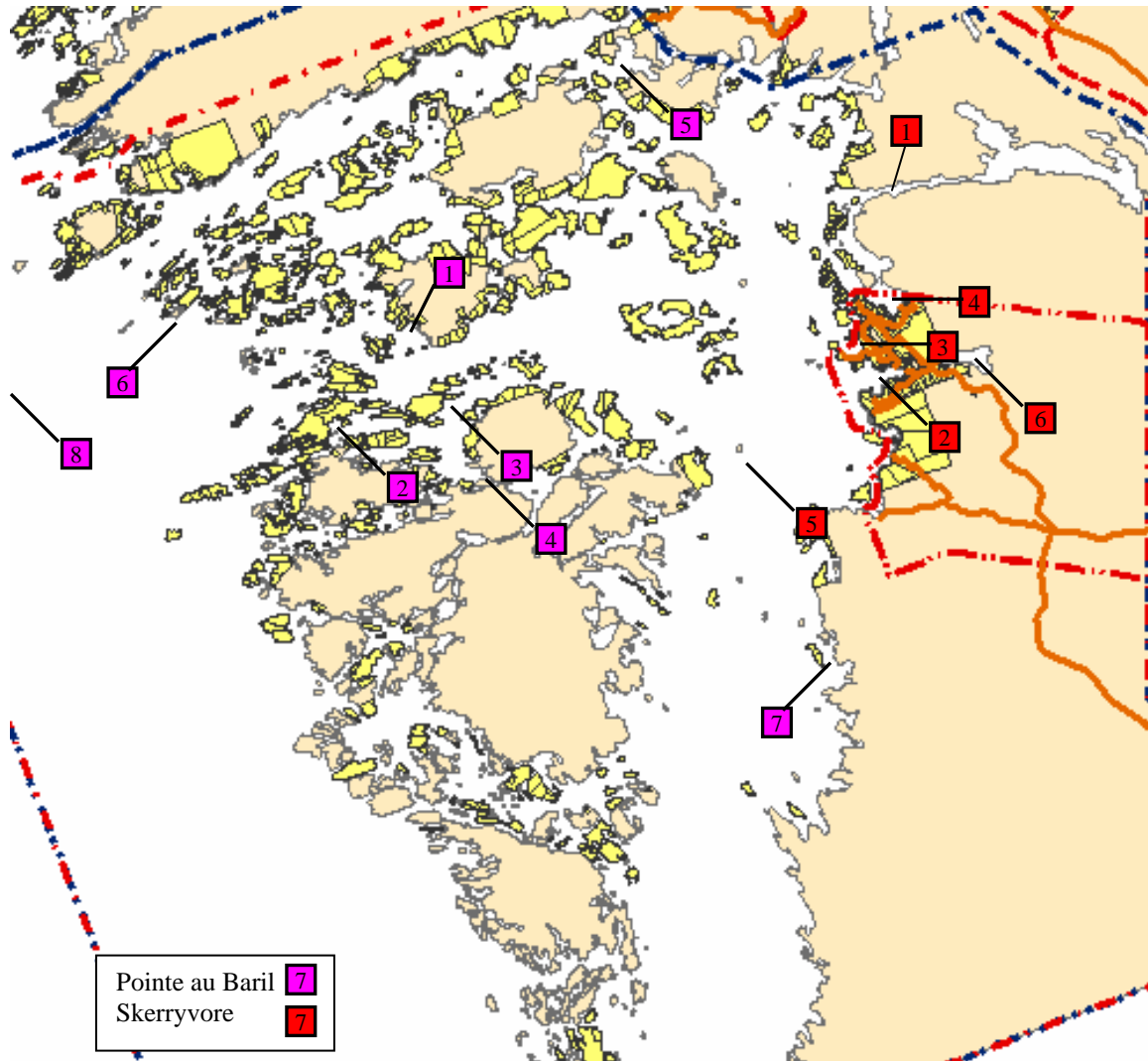
2.1 Sample Locations

Sampling sites have typically been focused on known or expected “hot spots”; areas that may be more likely to be polluted. Some sample areas have also been selected as control stations; these allow comparison between the variety of ecosystem types that exist along the coast and within inland lakes. Maps of the sample areas indicate the sampling locations for the different areas throughout the township. The sample sites include many of the sampling stations used in previous years and volunteers are encouraged to return to those sites in subsequent years. Unlike previous years, results for the different parameters are shown in table format, not on individual maps; refer to the maps when positioning the different samples.

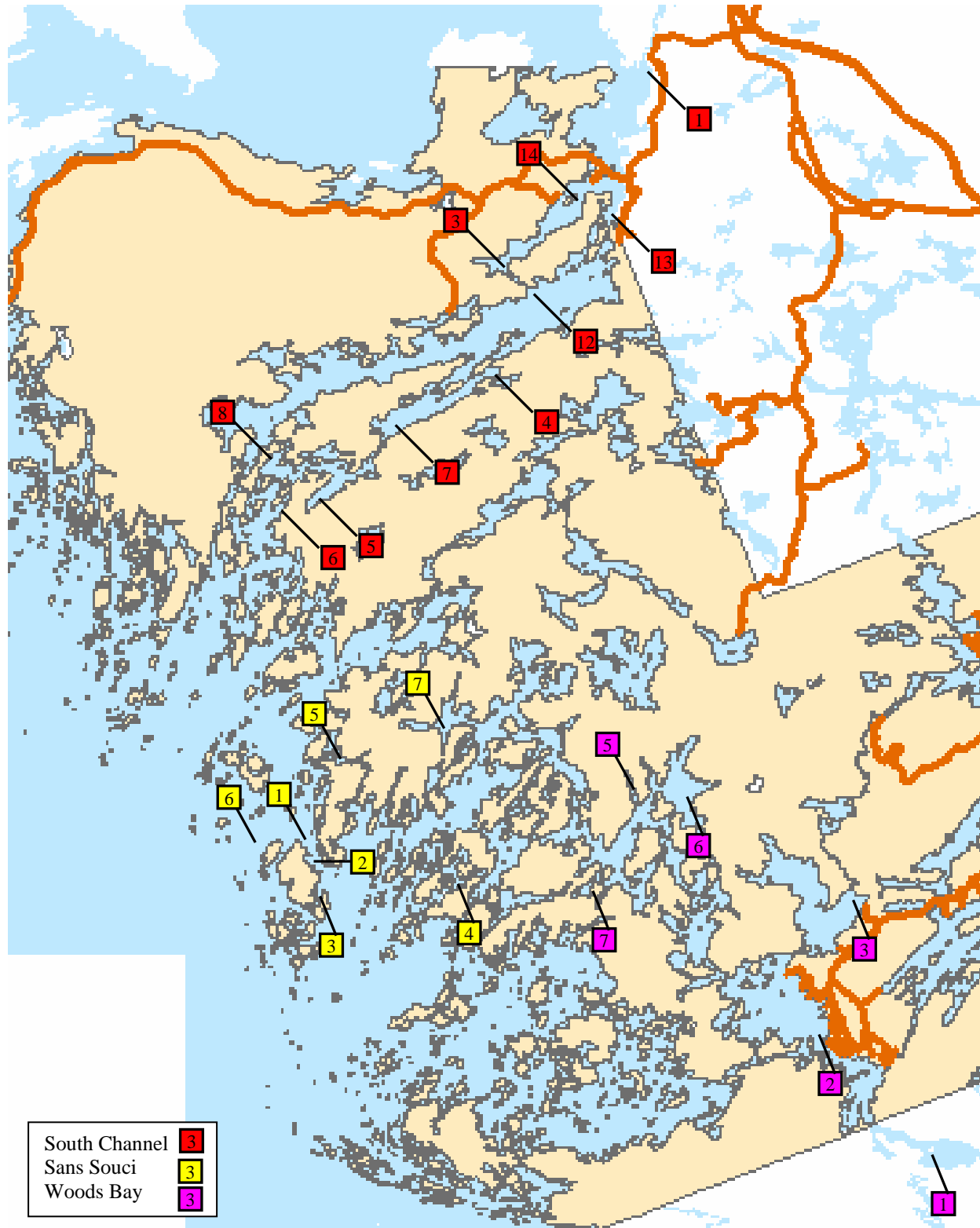
2.1.1 Sturgeon Bay Sampling Locations



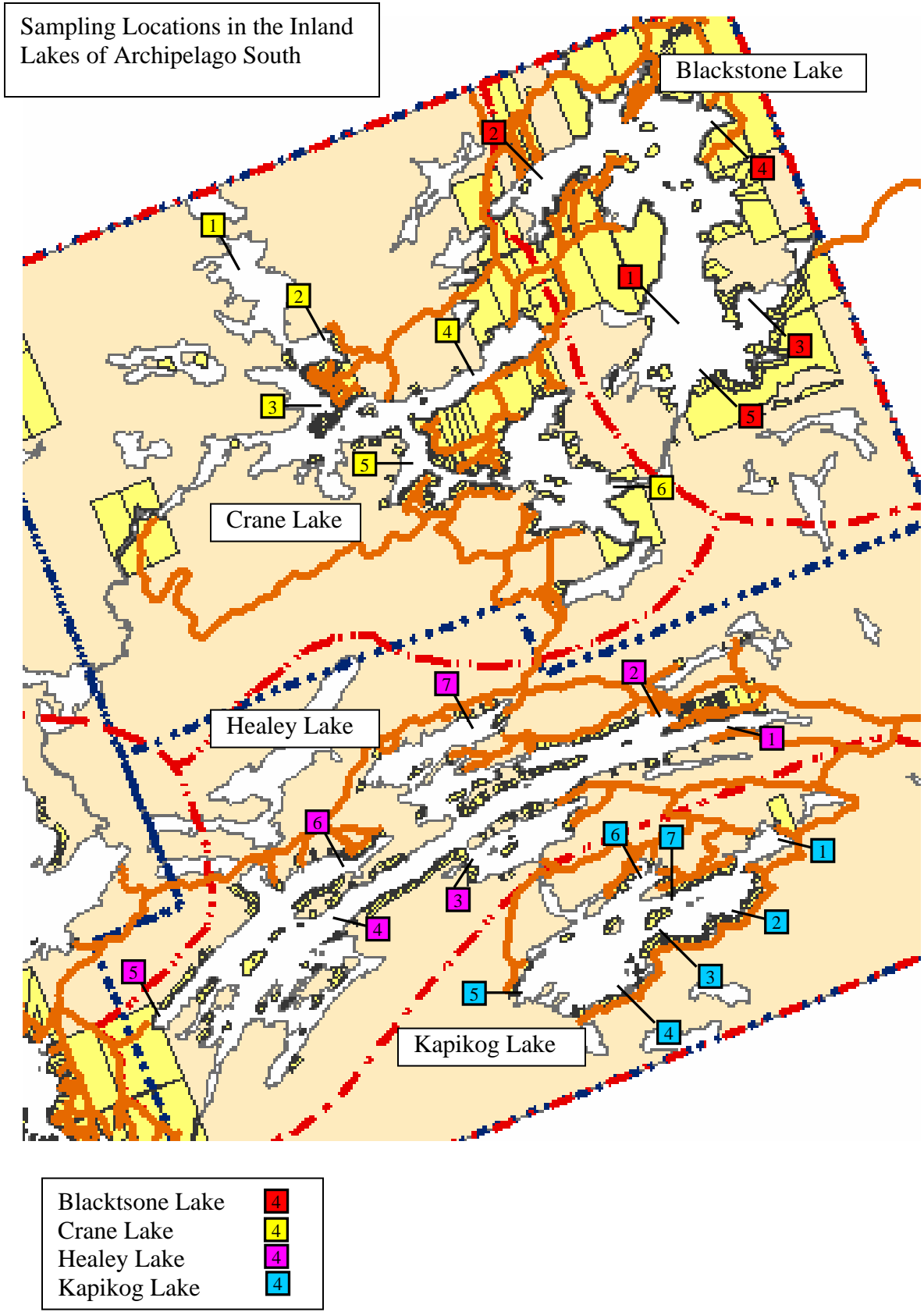
2.1.2 Pointe au Baril Islands and Skerryvore Sampling Locations



2.1.3 South Channel, Sans Souci and Woods Bay Sampling Locations



2.1.4 Inland Lakes of Archipelago South, Sampling Locations



2.2 Water Clarity

Water clarity is usually measured using a black-and-white Secchi disc which is lowered into the water until it just disappears from view. This depth is the Secchi depth of visibility, which is directly related to water clarity and can be used as a simple yet effective monitoring tool for determining the effects of human activities on water clarity and, indirectly, on eutrophication. In general, water clarity, as measured by Secchi depth, tends to be higher in open areas of Georgian Bay and in bays with good water circulation. Water clarity tends to diminish (lower Secchi depths) in enclosed bays, near wetlands or sources of organic material, and in lakes or areas that may naturally be more nutrient enriched. When examining the data, expect to see a small decline in Secchi depth throughout the year with lowest depths reading near the end of the summer and into September however a major decline in the readings should be evaluated more carefully. A multi-year comparison of data is of particular value here to assess the water clarity trends for a particular area and where possible, data from previous years have been included with the tables.

2.2.1 Secchi Depths (Water Clarity) in the Sans Souci Area of Georgian Bay, 2006

Date	Station							Average for All Stations
	1	2	3	4	5	6	7	Water Clarity
18-Jun	7.6	6.1	3.7	6.1	6.1	9.1	4.6	6.2
2-Jul	7.6	7.6	3.7	3.4	6.1		4.8	5.5
16-Jul	9.1	7.6		3.7	5.2	9.1	6.1	6.8
30-Jul	9.1	6.1	3.7	4.6	4.6	10.7	4.6	6.2
13-Aug	9.1	3.7	3.7	4.6	4.6	7.6	4.8	5.4
27-Aug	7.6	4.6	3.7	2.4	6.1	7.6	4.6	5.2
4-Sep	7.6	6.1	4.6	2.4	4.6	7.6	4.6	5.4
Average	8.2	6.0	3.9	3.9	5.3	8.6	4.9	5.8
Std Dev.	0.8	1.4	0.4	1.3	0.8	1.3	0.5	0.6
Previous Years Average								
2005	7.8	5.2	3.5	4.3	5.4	8.9	3.8	5.5
2004	8.9	5.5	3.5	4.5	5.2	12.1	5.0	6.5
2003	8.3	3.4	2.5	4.1	5.6	9.8	5.1	5.5
2002								7.8
2001								8.5

Depths in metres (m)

2.2.2 Secchi depths (Water Clarity) for Woods Bay Area of Georgian Bay, 2006

Date:	Station						Average all stations
	1	2	3	5	6	7	Water Clarity
19-Jun	3.5	n/a	n/a	4	4	4	3.9
8-Jul	3.7	n/a	n/a	3.4	3.5	4	3.7
5-Aug	3	n/a	n/a	4	4	4	3.8
6-Sep	3.1	n/a	n/a	3.8	3.8	4	3.7

Average	3.3			3.8	3.8	4.0	3.7
Std Dev	0.3			0.3	0.2	0.0	0.1

Previous Years Average	1	2	3	5	6	7	
2005	2.75		3	3.6	3.3	3.3	3.2
2004	2.8	1.7	2.9	3.3	3.3	3.4	2.3
2003	3.1	1.9	3.2	3.9	3.6	3.6	3.2
2002		3.2			3.8	4.2	
2001		4.5			5.0		

Depths in metres (m)

2.2.3 Secchi depths (Water Clarity) for the South Channel Area of Georgian Bay, 2006

Date	Station										Average all Stations
	1	3	4	5	6	7	8	12	13	14	
17-Jun	3	2.4	4.2	4.9	5.5	4.6	6.7	4	2.1	3.3	4.1
3-Jul	2.7	2.7	6.1	4.9	4.9	5.2	5.2	4.2	3	3.7	4.3
31-Jul	2.4	3	4.9	4	6.4	4.2	5.5	5.2	2.7	4.2	4.3
7-Aug	3	4.6	5.2	4.2	6.4	5.5	5.2	4.6	2.7	3.7	4.5
21-Aug	3.3	4.2	5.8	4	5.8	4.9	5.2	5.5	2.7	3	4.4
4-Sep	2.4	4	5.5	4.6	5.8	4.2	5.2	5.5	2.7	3	4.3
17-Sep	3.7	4.6	5.8	4.6	7	4.6	6.1	6.4	4	4.2	5.1
8-Oct	4.2	4.6	6.7	4.2	6.1	4.6	7	5.5	4.2	3.3	5.0

Average	3.1	3.8	5.5	4.4	6.0	4.7	5.8	5.1	3.0	3.6	4.5
Std. Dev.	0.6	0.9	0.8	0.4	0.6	0.5	0.7	0.8	0.7	0.5	0.4

Previous Years Average	1	3	4	5	6	7	8	12	13	14	
2005	3.3	3.7	5.0	4.5	6.5	4.7	5.1	4.6	2.8		4.5
2004	2.7	3.7	4.8	4.3	6.2	4.2	5.1	4.2	2.9		4.3
2003	2.7	3.3	4.5	4.5	6.1	4.2	4.9	3.8	2.9		4.0
2002	3.5				5.5	4.6		5.5			
2001	3.0				6.0						

Depths in metres (m)

2.2.4 Secchi Depths (Water Clarity) for the Sturgeon Bay area of Georgian Bay, 2006

Date	Station									
	1	2	3	4	5	6	7	8	9	10
22-Jun	1.5	2	2	2	2	2	2.1	2.7	2.8	1.6
17-Jul	2.3	2.5	2	1.7	2	tb	2.3	2.6	2.7	2
2-Aug	1.8	1.8	1.9	1.9	1.9	tb	2.9	2.3	2.5	0.6
19-Aug	1.9	1.6	1.7	1.7	1.8	tb	2.7	2	1.9	1.4
31-Aug	1.8	1.7	1.3	1.5	1.5	tb	2.8	1.8	1.9	1.3
19-Oct	1	1.2	1.2	1.4	1.4	tb	1.4	1.5	1.5	0.7

Average	1.7	1.8	1.7	1.7	1.8	2.0	2.4	2.2	2.2	1.3
Std. Dev.	0.4	0.4	0.4	0.2	0.3		0.6	0.5	0.5	0.5

Previous Years Average	1	2	3	4	5	6	7	8	9	10
2005	2.1	2.3	2.5	2.5	2.4	1.6	2.6	2.2	2.4	2.7
2004	1.9	2	1.9	1.9	2	1.6	2.2	2.2	2.6	2
2003	1.2	1.4	1.5	1.5	1.5	1.3	1.6	1.6	1.9	1.6
2002	0.6				0.7					
2001	1.2				1.6					

Date	Station				Average All Stations
	11	12	13	14	
22-Jun	3	3	3	3	2.1
17-Jul	2.7	2.9	3	tb	2.2
2-Aug	2.9	2.9	2.9	1.9	2.0
19-Aug	2.2	2.3	2.2	1.6	1.9
31-Aug	2.4	1.9	2.4	1.5	1.7
19-Oct	1.8	2	1.8	0.4	1.3

Average	2.5	2.5	2.6	1.7	1.9
Std. Dev.	0.5	0.5	0.5	0.9	0.3

Previous Years Average	11	12	13	14	Average All Stations
2005	2.5	2.5	2.5	2.2	2.4
2004	2.6	2.3	2.7	2.4	2
2003	1.9	2.1	2.0	1.5	1.6
2002	2.1				
2001	2.8				

Depths in metres (m)

2.2.5 Secchi Depth (Water Clarity) in Crane Lake, 2006

DATE	STATIONS						Average All Stations
	1	2	3	4	5	6	
11-Jun	3	3	3.8	4.3	3.8	3.3	3.5
3-Jul	5.5	5	4.8	4	tb	5.8	5.0
17-Jul	4.4	5	4.7	4.5	4.3	5	4.7
31-Jul	5	4.1	4.3	4.2	4.3	5	4.5
15-Aug	5	4.5	4.5	3.5	4.5	5.5	4.6
4-Sep	5.3	4.5	4.5	tb	4	5	4.7

Average	4.7	4.4	4.4	4.1	4.2	4.9	4.5
Std. Dev.	0.9	0.7	0.4	0.4	0.3	0.9	0.5

Previous Years Average	1	2	3	4	5	6	Average
2005	4.7	4.7	4.7	4.5	4.8	4.8	4.7
2004	4.3	4.4	4.4	4.1	4.4	5	4.4
2003	2.8	2.5	2.4	2.2	2.2	2.9	2.5

Depths in metres (m)

Station 1 – North End
Station 4 -- Marina

Station 2 – Armstrong/Fish Bay
Station 5 – Overflow Bay (Narrows)

Station 3 – Fish Bay/Agaming Landing
Station 6 – Mouth of Blackstone

2.3.9 Secchi Depth (Water Clarity) in Healey Lake, 2006

Date	Station							Average for all stations
	1	2	3	4	5	6	7	
4-Jun	3	2.4	4	3.7	3.7	3.4	1.5	3.1
15-Jul	3	3	3.4	3	3.4	3	1.8	2.9
12-Aug	3.4	3	4	3.4	3.4	3.7	1.8	3.2
3-Sep	3	2.7	3.4	3.4	3.4	3.7	1.8	3.1

Average	3.1	2.8	3.7	3.4	3.5	3.5	1.7	3.1
Std.Dev.	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.1

Previous Years Average	1	2	3	4	5	6	7	Average
2005	3.0	2.9	3.5	3.6	3.2	3.5	1.6	3.0
2004	2.9	3.2	3	3.3	3.2	3.2	1.1	2.9
2003	2.6	2.5	3	2.9	3.1	2.7	1.3	2.8

t.b. – disk to bottom Depths in metres (m)

#1 Healey Lake Lodge

#2 Between Two Marinas

#3 Kapikog Bay

#4 Main Channel (Btw Lots 337 & 264)

#5 West End (Lot #105)

#6 Lot #209

#7 East end of Dollar Bay

2.3.10 Secchi Depth (Water Clarity) in Kapikog Lake, 2006

Date:	Station								Average all stations
	1	2	3	4	5	6	7	8	
3-Jul	4	4	4	t.b.	4.8	4.8	4.6	4.3	4.4
16-Jul	4	4	4	t.b.	4.8	4.8	4.6	4.6	4.4
31-Jul	4	4	4	t.b.	4.3	4	4.3	4.3	4.1
14-Aug	4	4	4	t.b.	4.3	4	4	4.3	4.1
28-Aug	4	4	3.7	t.b.	3.4	3.4	3.4	3.7	3.7

Average	4.0	4.0	3.9		4.3	4.2	4.2	4.2	4.1
Std. Dev.	0	0	0.134		0.572	0.6	0.502	0.33	0.3

Previous Years Averages	1	2	3	4	5	6	7	8	Average
2005	4.3	4.5	4.3		4.3	4.5	4.4	4.6	4.4
2004	3.8	3.7	4.2		3.8	4.3	4.3	4.2	4.1
2003	3.1	3.4	3.3	2.9	3.1	3.2	3.1	3.4	3.2

t.b. – disk to bottom Depths in metres (m)

Station 1 – Marina Station 2 – Lot 14 Station 3 – Lot 42 Station 4 – Lot 48
 Station 5 – Chin’s Bay Station 6 – Monroe’s Bay Station 7 – Lot 89 Station 8 – Mid Lake

2.3 Bacterial Monitoring

Results of bacterial monitoring in a number of locations of the Township of The Archipelago are provided by location in this section of the report

2.3.1 Bacterial Reference Guidelines and Objectives

The following bacterial guidelines and objectives are provided to assist in the interpretation of bacterial monitoring results presented in this report.

Provincial Regulatory Guideline levels for total coliforms (TC) are as follows:

- 1,000 – levels higher than this are considered unsuited for recreational water use;
- 200 – levels higher than this are considered to be indicative of deteriorating water quality; and
- 10 – levels higher than this are considered unsafe for human consumption

NOTE: total coliforms are no longer used as a regulatory guideline in Provincial Water Quality Objectives. Total coliform levels have been found to be too variable and are largely considered to be a natural component of ecosystems

The objectives for *E. coli* (EC) are as follows:

- 100 – levels higher than this are considered unsuited for recreational water use
- 0 – levels higher than this are considered unsafe for human consumption without prior treatment.

NOTE: provincial bacterial levels are to be based on a geometric mean of five samples taken in the same local area at the same time.

Based on a number of years of intensive bacterial monitoring throughout the Township of Georgian Bay and the Township of The Archipelago, the following has been recommended as a suggested bacterial objective for recreational waters of Georgian Bay and the associated inland lakes:

- **Total Coliforms (annual average):** - **100 TC**
- ***E. Coli* (annual average):** - **10 EC**

The following tables present the data by sample area for each sampling location and date within that area. A calculated standard deviation and average is presented for each sample locations and an average of all sampling locations for each general area is also provided.

Recent heavy rain events are indicated by (**) beside the sampling dates and medium to light recent rain events are indicated by (*) beside each sample date.

2.3.2 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sans Souci Area of Georgian Bay, 2006

Date	Station														Average for All Stations	
	1		2		3		4		5		6		7		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
18-Jun	8	0	5	0	25	0	16	0	13	5	0	0	22	0	12.7	0.7
2-Jul	30	0	5	0	5	0	39	0	375	5	19	3	19	3	70.3	1.6
16-Jul	123	5	22	5	79	3	62	0	90	3	5	0	451	146	118.9	23.1
* 30-Jul	350	5	59	3	49	3	49	3	136	5	16	0	177	8	119.4	3.9
13-Aug	19	0	16	3	22	5	29	0	52	0	16	3	49	3	29.0	2.0
27-Aug	49	0	52	0	90	5	39	3	194	0	30	0	33	3	69.6	1.6
4-Sep	28	0	76	0	65	0	49	0	65	3	46	0	2424	0	393.3	0.4

avg	86.7	1.4	33.6	1.6	47.9	2.3	40.4	0.9	132.1	3.0	18.9	0.9	453.6	23.3	116.2	4.8
std	122.1	2.4	28.5	2.1	31.8	2.3	15.0	1.5	122.3	2.2	15.4	1.5	882.7	54.2	128.7	8.2

Previous Years Averages																
2005																
avg	39.3	0.9	27.1	2.0	40.7	1.6	77.0	5.0	61.9	3.6	15.2	0.0	56.1	2.4	46.4	2.4
std	27.3	1.5	15.3	2.0	42.4	2.1	66.3	6.9	48.0	4.4	22.5	0.0	39.9	4.0	20.2	2.5
2004																
avg	24.7	0.4	40.1	1.6	42.6	2.7	72.3	2.4	67.7	4.6	9.0	0.0	48.0	1.3	43.5	1.9
std	21.4	1.1	25.5	2.1	27.1	3.0	52.8	2.9	51.6	5.2	12.0	0.0	35.2	1.6	19.4	1.0
2003																
avg	415.0	19.3	37.6	0.6	35.6	2.8	366.6	45.6	109.7	12.3	8.6	3.6	8.6	3.6	140.9	10.3
std	889.0	24.3	38.1	1.3	37.4	4.8	744.0	71.8	70.9	19.8	6.8	5.7	6.8	5.7	133.6	12.46
2002																
avg	32.7	0.3	28.0	1.6	15.6	2.4	16.5	1.1	300.0	4.4	4.4	0.0	41.3	1.4	70.9	1.7
std	48.0	1.0	35.0	3.0	11.9	4.5	12.0	1.6	748.0	5.7	3.4	0.0	27.7	2.0	316.0	3.4
2001																
avg	14.9	0.0	240.0	1.3	49.5	3.7	42.1	5.1	139.0	1.3	11.7	0.0	81.2	1.4	82.6	1.8
std	14.4	0.0	724.0	1.8	43.3	5.7	24.7	5.1	204.0	2.2	9.0	0.0	55.1	1.9	260.3	2.2

2.3.3 Bacterial Sampling of Surface Water for Total Coliforms(TC) and E. Coli (EC) in the Woods Bay Area of Georgian Bay, 2006

Date:	Station												Average all Stations	
	1		2		3		5		6		7		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
19-Jun	49	8	65	8	55	11	8	5	5	0	5	5	31.2	6.2
8-Jul	69	3	72	5	28	13	39	2	19	0	19	5	41.0	4.7
5-Aug	194	72	110	5	49	22	72	5	83	3	25	11	88.8	19.7
6-Sep	52	30	94	5	43	11	55	11	33	5	28	8	50.8	11.7

Average	91.0	28.3	85.3	5.8	43.8	14.3	43.5	5.8	35.0	2.0	19.3	7.3	53.0	10.5
Std Dev	69.2	31.4	20.6	1.5	11.6	5.3	27.2	3.8	34.0	2.4	10.2	2.9	25.2	6.8

Previous Years Averages																	
2005																	
avg	77.8	15.3	68.6	5.4	62.8	8.5	104.2	22.2	35.8	3.5	88.6	12.4	73.6	12.6			
std	49.7	14.3	58.2	6.2	32.3	5.3	58.5	38.2	35.9	5.2	95.3	9.2	26.0	10.1			
2004																	
avg	155.8	9.4	95	6.2	46.4	11.6	73.6	9.6	189	13.4	66.6	10.8	66.6	10.8			
std	199.3	3.507	54.64	3.899	27.82	8.173	49.62	5.459	209.9	10.74	49.66	7.497	49.66	7.497			
2003																	
avg	198.4	28.6	174.8	13.4	182.6	17.0	237.4	13.8	170.4	12.0	132.2	7.0	182.6	15.3			
std	176.7	37.7	65.6	16.3	57.3	13.0	170.0	13.3	86.7	13.9	98.1	8.1	77.1	15.9			
2002																	
avg	75.0	4.8	108.0	6.0	46.6	8.0	107.2	11.4	73.4	1.2	66.6	8.2	79.3	6.6			
std	48.0	4.9	37.0	4.7	26.1	8.0	39.7	9.9	33.1	1.6	35.4	7.4	40.5	6.9			
2001																	
avg	158.0	5.8	113.0	5.6	21.4	3.4	70.5	6.0	39.1	2.1	60.4	3.6	77.1	4.4			
std	171.0	7.2	91.2	2.7	17.0	5.4	21.3	6.1	16.9	2.8	33.1	4.3	62.0	1.8			

2.3.4 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in the South Channel Area of Georgian Bay, 2006

Date	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
17-Jun	587	69	938	8	19	5	0	0	19	5	25	19
3-Jul	289	94	39	0	22	0	19	0	0	0	11	0
31-Jul	350	52	194	3	55	5	46	0	43	3	79	3
7-Aug	263	19	587	3	98	5	43	0	94	3	83	3
21-Aug	339	25	132	13	49	0	36	0	110	0	43	0
4-Sep	559	94	36	0	25	3	36	0	87	3	55	0
17-Sep	1370	94	72	8	8	0	510	3	28	8	16	5
8-Oct	59	8	8	0	11	8	8	0	5	0	11	0

Average	477.0	56.9	250.8	4.4	35.9	3.3	87.3	0.4	48.3	2.8	40.4	3.8
Std. Dev.	397.7	36.1	334.8	4.8	30.2	3.0	171.6	1.1	42.9	2.8	29.5	6.5

2005												
Average	819.5	219.7	125.7	1.2	203.1	0.0	632.7	4.2	72.5	0.3	320.2	4.3
Std. Dev.	1110.4	305.1	263.6	1.5	423.5	0.0	1034.3	10.2	118.8	0.9	745.1	10.3
2004												
Average	529.1	43.7	1114.3	8.2	1202.6	2.8	1115.9	2.7	833.3	4.2	901.9	1.1
Std. Dev.	777.4	23.8	1243.0	8.7	1186.8	4.1	1062.9	4.3	1193.3	7.7	1146.7	2.2
2003												
Average	677.9	38.0	48.3	5.0	26.1	0.9	94.6	14.0	353.3	0.0	374.1	1.7
Std. Dev.	834.1	26.3	65.6	11.2	17.3	1.5	122.2	37.0	913.1	0.0	904.4	2.0
2002												
Average	1789.0	91.0	794.0	3.4	489.0	0.9	136.0	0.9	726.0	1.6	748.0	0.9
Std. Dev.	1085.0	59.0	784.0	2.9	862.0	1.5	89.0	1.5	1160.0	3.0	942.0	1.5
2001												
Average	2148.0	113.0	860.0	11.9	1021.0	5.3	874.0	8.9	866.0	9.9	1139.0	3.0
Std. Dev.	731.0	87.1	887.0	16.2	1009.0	10.1	1066.0	9.2	1081.0	9.0	1209.0	1.7

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South Channel Data Cont...

Date	Station								Average All Stations	
	8		12		13		14		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC		
17-Jun	16	0	16	8	171	30	375	28	216.6	17.2
3-Jul	8	0	30	0	171	22	72	3	66.1	11.9
31-Jul	22	0	94	8	255	8	247	3	138.5	8.5
7-Aug	52	0	171	11	1174	19	289	11	285.4	7.4
21-Aug	59	0	94	0	188	5	171	11	122.1	5.4
4-Sep	25	3	33	22	59	3	28	3	94.3	13.1
17-Sep	151	5	16	0	76	16	2424	177	467.1	31.6
8-Oct	16	0	5	0	19	0	11	0	15.3	1.6

Average	43.6	1.0	57.4	6.1	264.1	12.9	452.1	29.5	175.7	12.1
Std. Dev.	47.0	1.9	57.5	7.9	375.8	10.5	807.2	60.3	145.0	9.2

2005										
Average	271.4	3.2	69.1	2.7	61.7	7.8	70	1	278.78	25.544
Std. Dev.	757.81	6.2147	92.617	4.0565	33.987	8.9044	39.345	1.7321	319.62	31.321
2004										
Average	564.3	3.3	1408.6	10.7	1058.2	27.1			969.8	11.5
Std. Dev.	763.6	5.1	1205.3	13.1	1059.2	52.5			609.6	6.9
2003										
Average	23.4	0.4	450.9	6.0	77.1	8.6			231.2	8.0
Std. Dev.	24.6	1.1	883.3	4.5	39.1	9.5			213.4	5.8
2002										
Average	631.4	2.4	462.0	14.6	1210.0	17.7			780.0	14.0
Std. Dev.	923.3	1.8	870.0	14.2	972.0	21.1			961.0	32.0
2001										
Average	375.0	3.0	998.0	11.0	1330.0	27.4			1067.9	21.5
Std. Dev.			999.0	11.1	1039.0	34.5			142.1	27.9

2.3.5 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sturgeon Bay Area of Georgian Bay, 2006

Date	Station											
	1		2		3		4		5		6	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
22-Jun*	43	3	25	3	19	0	16	0	8	0	65	0
17-Jul	740	8	59	0	59	8	59	0	5	0	87	5
2-Aug**	255	16	136	11	146	0	132	0	39	0	83	3
19-Aug	46	0	52	0	43	0	36	0	30	3	94	3
31-Aug	106	19	2424	694	90	52	171	36	451	350	489	65
19-Oct**	119	59	308	87	156	30	119	49	36	25	119	43

Avg	218.2	17.5	500.7	132.5	85.5	15.0	88.8	14.2	94.8	63.0	156.2	19.8
Std	267.0	21.6	947.8	277.1	55.8	21.5	60.8	22.3	175.1	140.9	164.0	27.4

2005	Avg	271.3	24.3	383.7	11.3	46.6	7.6	29.7	7.7	41.0	7.3	124.7	26.1
	Std	268.1	27.2	899.9	8.9	56.5	8.8	24.0	12.1	61.3	7.6	93.2	30.5
2004	Avg	159.4	5.0	267.4	2.0	395.0	2.3	311.1	1.6	186.0	0.4	88.6	3.6
	Std	135.6	3.6	487.5	2.0	619.3	4.9	385.7	2.1	146.8	1.1	48.0	3.7
2003	Avg	1107.5	4.6	466.5	2.6	744.3	0.4	991.8	1.4	963.4	0.4	570.6	6.8
	Std	1133.1	6.6	807.9	3.7	1046.0	1.1	1190.7	2.0	1210.4	1.1	799.9	11.5
2002	Avg	1039.0	9.7	871.0	5.4	548.0	1.8	619.0	2.4	941.0	1.8	488.0	4.1
	Std	1066.0	10.4	1031.0	8.0	826.0	2.9	669.0	2.1	1229.0	3.9	569.0	6.1

Date	Station											
	7		8		9		10		11		12	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
22-Jun	83	19	46	8	362	16	33	3	36	0	62	5
17-Jul	52	5	39	0	98	22	213	3	83	0	36	0
2-Aug	161	25	151	22	166	22	2424	166	141	11	240	13
19-Aug	90	11	90	11	59	8	62	5	52	0	87	13
31-Aug	271	25	339	194	339	194	271	240	69	13	106	13
19-Oct	694	52	102	28	289	25	1696	171	1696	25	308	19

Avg	225.2	22.8	127.8	43.8	218.8	47.8	783.2	98.0	346.2	8.2	139.8	10.5
Std	242.7	16.3	111.2	74.2	128.7	71.9	1019.4	106.6	662.3	10.1	108.7	6.8

2005	Avg	105.6	18.9	46.1	11.3	117.7	16.3	277.4	17.6	48.0	9.0	56.0	18.4
	Std	93.1	11.4	22.3	9.5	133.4	23.1	486.3	20.0	28.9	9.4	32.4	16.4
2004	Avg	247.9	11.3	174.7	2.6	419.7	4.3	186.6	11.3	183.7	3.9	109.3	1.6
	Std	330.5	12.6	235.7	3.4	884.3	1.9	132.8	10.0	248.2	4.4	111.3	2.1
2003	Avg	332.8	2.6	688.0	1.6	664.3	11.5	914.6	6.8	508.4	4.3	742.4	5.1
	Std	419.7	5.0	1077.9	3.1	1086.9	26.4	1036.3	11.5	888.3	8.1	1149.8	13.6
2002	Avg	226.0	6.0	212.0	11.6	186.0	11.5	204.0	6.0	355.0	4.8	209.0	6.8
	Std	332.0	6.0	193.0	16.8	242.0	14.8	220.0	7.1	837.0	6.4	343.0	10.0

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Date	Station				Average All Stations	
	13		14			
	TC	EC	TC	EC	TC	EC
22-Jun*	55	8	83	16	66.9	5.8
17-Jul	30	0	161	5	122.9	4.0
2-Aug**	114	5	161	28	310.6	23.0
19-Aug	52	0	59	3	60.9	4.1
31-Aug	98	5	156	49	384.3	139.2
19-Oct**	83	5	2424	59	582.1	48.4

Avg	72.0	3.8	507.3	26.7	254.6	37.4
Std	31.7	3.2	940.0	23.2	208.5	52.8

2005						
Avg	74.6	12.9	34.7	7.3	118.6	14.2
Std	93.0	12.4	11.7	7.6	92.8	11.3
2004						
Avg	183.4	2.0	148.0	4.4	218.6	4.0
Std	299.9	2.0	161.7	4.4	250.5	1.6
2003						
Avg	519.8	3.0	1084.1	1.1	729.3	3.8
Std	897.3	6.7	1254.5	3.0	836.4	5.5
2002						
Avg	145	3	328	8.2	456	6
Std	201	5	469	15.8	708	9.4

2.3.6 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Skerryvore Area of Georgian Bay, 2005

DATE	STATIONS												Average All Stations	
	1		2		3		4		5		6		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
14-Jun	39	25	25	3	16	0	43	3	0	0	106	5	38.2	6.0
28-Jun	39	5	28	5	83	3	19	5	11	3	240	16	70.0	6.2
13-Jul	46	13	16	5	36	8	13	5	8	0	2424	8	423.8	6.5
27-Jul	240	136	188	22	200	62	289	87	8	5	226	36	191.8	58.0
16-Aug	289	3	39	3	65	5	33	8	11	3	233	59	111.7	13.5
15-Sep	188	0	22	0	79	19	36	13	22	3	328	76	112.5	18.5
Average	140.2	30.3	53.0	6.3	79.8	16.2	72.2	20.2	10.0	2.3	592.8	33.3	158.0	18.1
Std. Dev.	112.9	52.5	66.6	7.9	64.3	23.4	106.8	32.9	7.1	2.0	899.9	29.1	140.1	20.2
2005														
Avg	1007.0	15.4	1051.6	60.0	1007.8	519.8	1010.6	51.0	1110.6	52.2	1501.2	61.0	1114.8	126.6
std	1294.2	11.3	1253.7	68.6	1292.9	1065.5	1290.3	61.4	1215.3	38.1	985.2	80.1	1196.5	189.8
2004														
avg	158.8	6.7	174.3	8.8	484.3	22.2	68.7	6.7	225.3	1.0	1296.0	35.2	401.3	13.4
std	70.4	6.6	224.4	12.4	951.9	34.1	71.7	6.6	465.4	1.5	1029.3	46.2	258.9	9.1
2003														
avg	194.0	44.4	73.7	7.8	97.6	25.1	107.4	32.2	11.6	3.1	455.9	46.7	142.8	25.7
std	71.9	55.5	66.0	8.5	57.7	21.7	105.9	32.0	6.0	1.2	289.3	20.1	33.7	18.2
2002														
avg	1905.0	10.8	65.2	7.3	81.2	10.8	332.0	10.8	878.0	3.2	1392.0	40.3	775.0	13.9
std	961.0	9.1	65.0	9.6	66.8	8.8	465.0	7.3	1003.0	4.4	1156.0	37.3	993.0	19.9
2001														
avg	52.2	4.4	78.4	8.2	55.4	1.6	42.4	7.6	523.0	0.6	2070.0	40.6	470.2	10.5

2.3.7 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Pointe au Baril Islands Area of Georgian Bay, 2006

Date	Station									
	1		2		3		4		5	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
3-Jul	8	3	8	3	8	3	43	5		
17-Jul	5	3	19	3	22	8	36	5	33	5
31-Jul	3	3	25	5	28	5	90	5	19	0
15-Aug	13	3	39	8	33	13	102	8	13	0
31-Aug	3	3	28	22	5	3	28	5	13	3

avg	6.4	3.0	23.8	8.2	19.2	6.4	59.8	5.6	19.5	2.0
std	4.2	0.0	11.4	8.0	12.3	4.2	33.7	1.3	9.4	2.4

2005										
avg	176.4	17.4	54.8	19.6	494.8	2.2	45.5	9.0	34.5	2.0
std	177.7	32.8	46.1	18.0	1079.1	2.2	61.3	11.2	40.0	2.4
2004										
avg	564.1	9.6	441.0	6.4	526.7	7.4	417.1	24.3	468.0	14.0
std	893.8	10.9	600.3	3.9	915.1	7.4	548.5	31.6	865.5	18.8
2003										
avg	64.3	7.3	93.7	11.0	57.0	2.7	60.7	13.7	60.3	3.3
std	29.2	12.7	46.1	12.2	23.1	2.5	30.0	14.4	33.4	2.9
2002										
avg	56.3	3.0	135.0	2.7	47.7	3.7	52.0	1.7	58.3	3.3
std	41.0	0.0	196.0	4.6	22.3	1.2	39.3	2.9	56.1	2.9
2001										
avg	178.0	0.5	40.3	5.8	21.3	1.0	55.7	9.7	28.5	2.3
std	335.6	1.2	28.1	9.5	17.5	1.5	29.8	7.0	13.8	2.0

2.3.8 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Blackstone Lake, 2006

Date	Station										Average for All Stations	
	1		2		3		4		5		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
8-Jul	19	0	28	0	90	13	127	5	30	0	58.8	3.6
8-Sep	30	0	39	0	83	0	62	19	76	3	58.0	4.4
avg	24.5	0.0	33.5	0.0	86.5	6.5	94.5	12.0	53.0	1.5	58.4	4.0
std	7.8	0.0	7.8	0.0	4.9	9.2	46.0	9.9	32.5	2.1	0.6	0.6
2005												
avg	524.0	0.0	1034.8	2.0	852.5	1.5	725.8	0.8	324.5	0.8	692.3	1.0
std	648.3	0.0	1220.6	2.4	1132.9	1.7	846.3	1.5	360.6	1.5	799.8	0.7
2004												
avg	19.0	0.0	34.0	4.0	17.5	1.5	26.0	4.0	22.0	6.5	23.7	3.2
std	19.8	0.0	12.7	1.4	2.1	2.1	9.9	5.7	15.6	9.2	1.0	2.3
2003												
avg	23.7	2.7	43.0	0.0	18.3	0.0	52.0	2.7	21.7	0.0	31.7	1.1
std	25.4	2.5	51.4	0.0	11.9	0.0	38.3	2.5	25.0	0.0	29.9	0.9
2002												
avg	21.7	2.7	43.3	1.0	52.7	3.3	59.0	6.0	38.0	4.7	42.9	3.5
std	23.9	4.6	26.8	1.7	51.6	2.9	41.4	6.6	35.8	2.9	34.2	3.9
2001												
avg	18.3	2.3	13.3	3.3	6.8	1.5	42.3	5.3			20.2	3.1
std	18.6	1.5	3.8	3.9	3.5	1.7	28.2	2.1			12.1	1.1

Station 1 – Centre of Lake
Station 4 – Blackstone Landing

Station 2 – McRoberts Bay
Station 5 – Lawson Bay (new)

Station 3 – Lawson Bay(old)

2.3.9 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Crane Lake, 2006

DATE	STATIONS												Average All Stations	
	1		2		3		4		5		6		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
11 - Jun *	8	3	13	3	30	5	28	5	25	0	19	5	20.5	3.5
3-Jul	13	0	36	3	559	16	740	16	938	11	11	0	382.8	7.7
17-Jul	30	5	127	79	418	22	219	36	106	28	39	19	156.5	31.5
31 Jul *	79	5	127	11	46	3	52	0	62	11	2424	5	465.0	5.8
15 - Aug *	119	8	83	8	98	13	156	13	289	8	219	3	160.7	8.8
4 Sept **	146	35	102	22	127	43	123	33	141	30	79	28	119.7	31.8
10-Oct	36	8	52	3	196	13	76	8	116	3	84	3	93.3	6.3
avg	61.6	9.1	77.1	18.4	210.6	16.4	199.1	15.9	239.6	13.0	410.7	9.0	199.8	13.6
std	54.2	11.7	44.8	27.6	201.7	13.4	247.2	13.8	319.0	11.7	890.5	10.4	161.8	12.4
2005														
avg	794.7	8.2	913.0	10.3	501.5	9.2	555.3	8.5	584.8	8.0	844.0	6.5	698.9	8.4
std	1008.5	5.8	1179.2	7.5	950.3	7.0	951.2	6.8	930.8	4.8	1224.4	7.1	911.9	3.9
2004														
avg	1104.7	4.3	1175.1	12.6	1081.3	6.9	1142.1	7.6	1077.3	7.3	1393.3	8.3	1162.3	7.8
std	1241.5	4.1	1204.2	17.9	1258.7	4.8	1209.9	5.6	1261.5	4.8	1285.5	8.1	1209.3	5.3
2003														
avg	74.4	16.0	69.0	17.7	183.8	21.4	161.3	17.7	203.9	14.4	366.1	12.6	143.7	16.1
std	48.9	12.8	26.0	10.5	38.3	14.4	76.5	10.8	93.5	11.3	382.5	10.8	46.9	11.0
2002														
avg	36.3	3.0	301.0	18.4	37.6	6.6	68.7	28.1	79.4	9.4	43.0	6.7	93.1	11.8
std	37.0	4.5	487.0	20.1	30.3	5.0	90.3	35.9	69.6	11.5	40.0	7.9	213.0	18.8
2001														
avg	68.1	5.9	125.0	17.1	67.7	9.7	93.0	7.3	34.0	5.3	614.0	8.1	167.0	8.9
std	110.0	5.6	143.0	8.6	90.2	6.6	85.5	8.0	31.6	8.0	1010.0	11.8	376.5	2.1

Station 1 – North End
Station 4 - Marina

Station 2 – Armstrong/Fish Bay
Station 5 – Overflow Bay (Narrows)

Station 3 – Fish Bay/Agaming Landing
Station 6 – Mouth of Blackstone

2.4.10 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Healey Lake, 2006

Date	Station														Average for All Stations	
	1		2		3		4		5		6		7		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
4-Jun	13	5	8	3	11	5	8	5	25	11	0	0	22	11	12.4	5.7
15-Jul	62	13	76	3	30	0	46	0	83	13	83	28	49	3	61.3	8.6
12-Aug	136	3	794	3	451	5	119	0	2424	8	90	3	2424	0	919.7	3.1
3-Sep	98	5	87	3	28	5	3	0	136	28	72	28	161	8	83.6	11.0
Average	77.3	6.5	241.3	3.0	130.0	3.8	44.0	1.3	667.0	15.0	61.3	14.8	664.0	5.5	269.3	7.1
Std. Dev.	52.4	4.4	370.2	0.0	214.2	2.5	53.6	2.5	1172.2	8.9	41.5	15.3	1174.9	4.9	434.7	3.4
2005																
avg	31.8	3.6	25.0	4.0	13.2	3.2	11.0	7.0	4.0	1.5	8.3	4.0	51.4	6.8	31.3	4.5
std	42.8	3.5	23.5	1.2	12.5	2.0	17.1	12.1	3.4	1.7	7.5	5.2	74.4	1.6	42.8	3.3
2004																
avg	402.7	8.6	89.7	3.1	31.4	2.0	737.3	3.9	47.0	1.1	38.7	2.6	85.3	4.0	204.6	3.6
std	896.1	9.7	115.3	4.6	38.3	3.0	1156.9	4.9	55.1	2.0	46.5	2.5	129.9	4.1	298.6	3.3
2003																
avg	79.3	20.0	74.7	2.0	36.3	3.7	62.3	5.3	55.7	2.0	62.0	1.0	79.3	4.7	64.2	5.5
std	30.0	22.9	41.2	1.7	5.8	4.0	43.4	6.8	41.9	1.7	30.6	1.7	59.9	5.7	19.1	5.3
2002																
avg	158.0	6.3	94.3	4.3	230.0	5.0	39.3	6.3	17.0	2.0	55.7	1.0	42.7	1.0	91.1	3.7
std	66.4	2.9	11.5	4.0	38.7	0.0	13.7	4.2	6.2	1.7	31.8	1.7	14.8	1.7	19.0	1.5
2001																
avg	56.5	3.5	41.5	0.0	113.0	1.3	40.8	0.8	57.8	0.8	33.8	0.8	25.3	0.0	46.1	0.9
std	15.2	3.3	15.9	0.0	107.0	2.5	26.0	1.5	31.7	1.5	33.7	1.5	5.6	0.0	33.5	1.2

#1 Healey Lake Lodge

#2 Between Two Marinas

#3 Kapikog Bay

#4 Main Channel (Btw Lots 337 & 264

#5 West End (Lot #105)

#6 Lot #209

#7 East end of Dollar Bay

2.3.10 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Kapikog Lake, 2006

Date:	Station																Average all Stations	
	1		2		3		4		5		6		7		8		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
3-Jul *	8	8	11	8	13	13	0	0	3	3	3	3	11	8	8	0	7.1	5.4
16-Jul *	52	5	36	0	52	5	49	0	79	0	136	19	49	5	87	3	67.5	4.6
31-Jul *	94	3	83	19	89	0	25	0	72	0	213	3	110	19	206	0	111.5	5.5
14-Aug	39	8	11	11	161	5	87	0	65	3	127	3	156	8	39	3	85.6	5.1
28 - Aug *	5	5	16	8	65	8	33	0	5	0	13	13	5	5	5	5	18.4	5.5
Avg	39.6	5.8	31.4	9.2	76.0	6.2	38.8	0.0	44.8	1.2	98.4	8.2	66.2	9.0	69.0	2.2	58.0	5.2
std	36.4	2.2	30.6	6.8	54.9	4.8	32.2	0.0	37.6	1.6	89.1	7.4	65.3	5.8	83.4	2.2	44.4	0.4
2005																		
Avg	354.3	8.5	53.3	4.5	629.0	2.0	56.3	7.5	58.5	4.0	32.0	3.5	20.5	2.0	55.8	6.0	157.4	4.8
std	320.7	11.0	48.4	3.3	1196.9	2.4	36.0	5.2	47.3	3.4	22.2	5.2	21.0	2.4	73.5	7.7	209.6	4.4
2004																		
Avg	67.5	1.5	38.0	4.0	60.5	1.5	37.0	4.8	20.0	0.8	44.0	6.3	96.3	2.0	297.8	1.5	82.6	2.8
std	29.0	1.7	41.6	3.4	54.1	1.7	28.9	7.6	26.4	1.5	50.8	3.9	83.6	2.4	382.0	1.7	36.5	1.6
2003																		
Avg	38.5	3.2	59.7	4.5	12.8	1.3	43.3	4.0	23.5	1.5	15.8	1.3	55.7	1.5	16.7	2.3	35.6	2.5
std	29.1	1.8	44.8	5.1	13.2	2.2	32.4	6.2	32.7	1.6	6.6	2.2	29.8	1.6	19.0	2.0	9.1	1.6
2002																		
Avg	449	737	764	7	55	3	471	13	410	5	616	9	727	2	446	4	492	6
std	878.0	5.5	1136	7.0	54.0	3.6	865.0	16.3	892.0	6.0	1008	9.7	1160	3.3	878.0	4.4	883.0	8.2

Station 1 – Marina
Station 5 – Chin’s Bay

Station 2 – Lot 14
Station 6 – Monroe’s Bay

Station 3 – Lot 42
Station 7 – Lot 89

Station 4 – Lot 48
Station 8 – Mid Lake

Figure 2.4.11 Area Comparison of Bacteria Data

Skerryvore			Sturgeon Bay			Woods Bay		
Average All Stations			Average All Stations			Average all Stations		
DATE	TC	EC	DATE	TC	EC	Date:	TC	EC
14-Jun	38.2	6.0	22-Jun *	66.9	5.8	19-Jun	31.2	6.2
28-Jun	70.0	6.2	17-Jul	122.9	4.0	8-Jul	41.0	4.7
13-Jul	423.8	6.5	2 - Aug **	310.6	23.0	5-Aug	88.8	19.7
27-Jul	191.8	58.0	19-Aug	60.9	4.1	6-Sep	50.8	11.7
16-Aug	111.7	13.5	31-Aug	384.3	139.2			
15-Sep	112.5	18.5	19 - Oct **	582.1	48.4			

Average 158.0 18.1 254.6 37.4 53.0 10.5
 Std. Dev. 140.1 20.2 208.5 52.8 25.2 6.8

Pointe au Baril			Sans Souci			South Channel		
Average for All Stations			Average for All Stations			Average All Stations		
Date	TC	EC	Date	TC	EC	Date	TC	EC
3-Jul	17	4	18-Jun	12.7	0.7	17-Jun	216.6	17.2
17-Jul	29	5	2-Jul	70.3	1.6	3-Jul	66.1	11.9
31-Jul	33	3	16-Jul	118.9	23.1	31-Jul	138.5	8.5
15-Aug	36	5	* 30-Jul	119.4	3.9	7-Aug	285.4	7.4
31-Aug	15	6	13-Aug	29.0	2.0	21-Aug	122.1	5.4
			27-Aug	69.6	1.6	4-Sep	94.3	13.1
			4-Sep	393.3	0.4	17-Sep	467.1	31.6
						8-Oct	15.3	1.6

Average 25.8 4.2 116.2 4.8 175.7 12.1
 Std. Dev. 9.4 1.1 128.7 8.2 145.0 9.2

Blackstone Lake			Crane Lake			Healey Lake			Kapikog Lake		
Average for All Stations			Average All Stations			Average for All Stations			Average all Stations		
Date	TC	EC	DATE	TC	EC	Date	TC	EC	Date:	TC	EC
8-Jul	58.8	3.6	11-Jun *	20.5	3.5	4-Jun	12.4	5.7	3-Jul *	7.1	5.4
8-Sep	58.0	4.4	3-Jul	382.8	7.7	15-Jul	61.3	8.6	16-Jul *	67.5	4.6
			17-Jul	156.5	31.5	12-Aug	919.7	3.1	31-Jul *	111.5	5.5
			31 Jul **	465.0	5.8	3-Sep	83.6	11.0	14-Aug	85.6	5.1
			15 - Aug **	160.7	8.8				28-Aug *	18.4	5.5
			4 - Sep **	119.7	31.8						
			10-Oct	93.3	6.3						

Average 58.4 4.0 199.8 13.6 269.3 7.1 58.0 5.2
 Std. Dev. 0.6 0.6 161.8 12.4 434.7 3.4 44.4 0.4