Volunteer Water Quality Monitoring Program
Report on 2011 Sampling Data

Township of The Archipelago
June 2012

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 that has lasted since its inception in 1999. The volunteer-based program provides an important avenue for relaying information about our environment to ratepayers and for providing valuable information to the Township.

We owe continued thanks to all the volunteers who commit time and resources toward the ongoing success and long term vision that is water quality monitoring. Additionally, we are grateful to the ongoing support and interest of Dr. Karl Schiefer who continues to provide advice on various technical aspects of the program and is always passionate about environmental quality on the Georgian Bay coast and inland waters.

The Township wishes to thank all of its ratepayers, and in particular the volunteer monitors, for their keen interest and drive to ensure our high quality environment is maintained.

Report Compiled by Greg Mason, of Georgian Bay GENERATIONS.

For information on its content please contact:

Township of The Archipelago
9 James St.
Parry Sound, ON
P2A 1T4

Table of Contents

Acknowledgements i
1.0 Introduction 1
2.0 Results 2
2.1 Sample Locations **2**
2.1.1 Sans Souci and Woods Bay Sampling Locations 3
2.1.2 South Channel Sampling Locations 4
2.1.3 Sturgeon Bay Sampling Locations 5
2.1.4 Skerryvore and Pointe au Baril Islands Sampling Locations 6
2.1.5 Bayfield Inlet and Nares Inlet Sampling Locations 7
2.1.6 Blackstone and Crane Lake Sampling Locations 8
2.1.7 Healey Lake and Kapikog Lake Sampling Locations 9
2.1.8 Naiscoot Lake Sampling Locations 10
2.2 Water Clarity **11**
2.2.1 Secchi Depths (Water Clarity) in the Sans Souci Area 12
2.2.2 Secchi Depths (Water Clarity) for Woods Bay Area 13
2.2.3 Secchi Depths (Water Clarity) for the South Channel Area 14
2.2.4 Secchi Depths (Water Clarity) for the Sturgeon Bay Area 15
2.2.5 Secchi Depth (Water Clarity) in Skerryvore Area 16
2.2.6 Secchi Depth (Water Clarity) in Point au Baril Islands Area 16
2.2.7 Secchi Depth (Water Clarity) in Blackstone Lake 17
2.2.8 Secchi Depth (Water Clarity) in Crane Lake 18
2.2.9 Secchi Depth (Water Clarity) in Healey Lake 19
2.2.10 Secchi Depth (Water Clarity) in Kapikog Lake 20
2.2.11 Secchi Depth (Water Clarity) in Naiscoot Lake 21
2.3 Bacterial Monitoring **22**
2.3.1 Bacterial Reference Guidelines and Objectives 22
2.3.2 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sans Souci Area 24
2.3.3 Bacterial Sampling of Surface Water for Total Coliforms(TC) and E. Coli (EC) in the Woods Bay Area 25
2.3.4 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in the South Channel Area 25
2.3.5 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sturgeon Bay Area 30
2.3.6 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Skerryvore Area 33

2.3.7 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Pointe au Baril Islands Area.....34
2.3.8 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Bayfield and Nares Inlets.....37
2.3.9 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Blackstone Lake 38
2.3.10 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Crane Lake 39
2.3.11 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Healey Lake 41
2.3.12 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in Kapikog Lake.....42
2.3.13 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Naiscoot Lake.....44

Area Data

Sturgeon Bay
Sample Locations Page 5
Water Clarity Page 15
Bacterial Sampling Page 30-32

Skerryvore
Sample Locations Page 6
Water Clarity Page 14
Bacterial Sampling Page 33-34

Pointe au Baril Islands
Sample Locations Page 6
Water Clarity Page 16
Bacterial Sampling Page 34

Bayfield Inlet and Nares Inlet
Sample Locations Page 7
Bacterial Sampling Page 37

South Channel
Sample Locations Page 4
Water Clarity Page 14
Bacterial Sampling Page 25

Sans Souci
Sample Locations Page 3
Water Clarity Page 12
Bacterial Sampling Page 24

Woods Bay
Sample Locations Page 3
Water Clarity Page 13
Bacterial Sampling Page 25

Blackstone Lake
Sample Locations Page 8
Water Clarity Page 17
Bacterial Sampling Page 38

Crane Lake
Sample Locations Page 8
Water Clarity Page 18
Bacterial Sampling Page 39-40

Healey Lake
Sample Locations Page 9
Water Clarity Page 19
Bacterial Sampling Page 41

Kapikog Lake
Sample Locations Page 9
Water Clarity Page 20
Bacterial Sampling Page 42

Naiscoot Lake
Sample Locations Page 10
Water Clarity Page 21
Bacterial Sampling Page 44

1.0 Introduction

This report provides a summary of results from the 2011 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 these were followed for the 2011 season. Similar to past reports, the purpose here is to present the data gathered in the 2011 sampling season in detail but also to indicate summaries of past year's results to enable comparison of ongoing trends. It should be noted that this report was created by Township of The Archipelago staff and by Greg Mason of Georgian Bay GENERATIONS and no analysis or review is provided internally. A Water Quality Review is also available from the Township which provides that analysis. For information on this report and/or the volunteer water quality monitoring program in The Archipelago, please contact Elke Dyck at the Township of The Archipelago.

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 2011. 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.

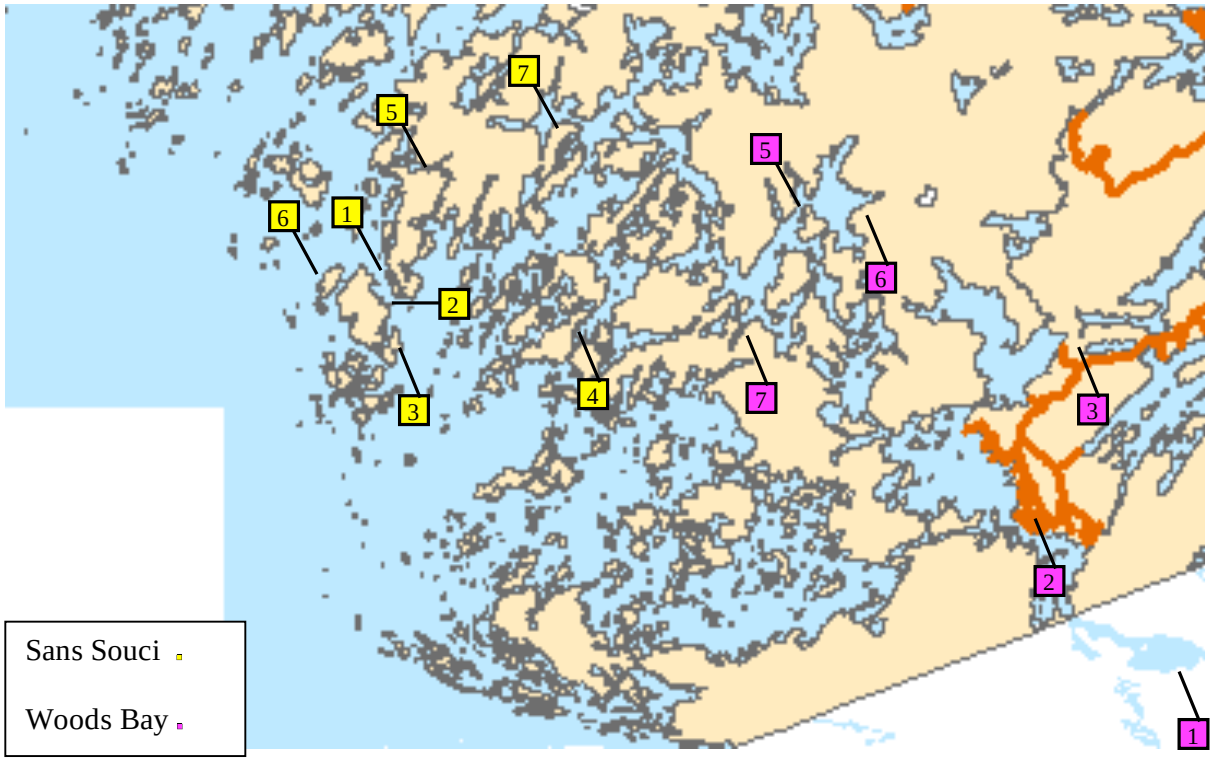
Charts are provided comparing water quality in the inland lakes, open bay sampling areas, and back bay sampling areas. When reviewing these data please keep in mind similarities and differences in the surrounding ecosystem and potential differences in sampling methodology (i.e. sampling times).

2.1 Sample Locations

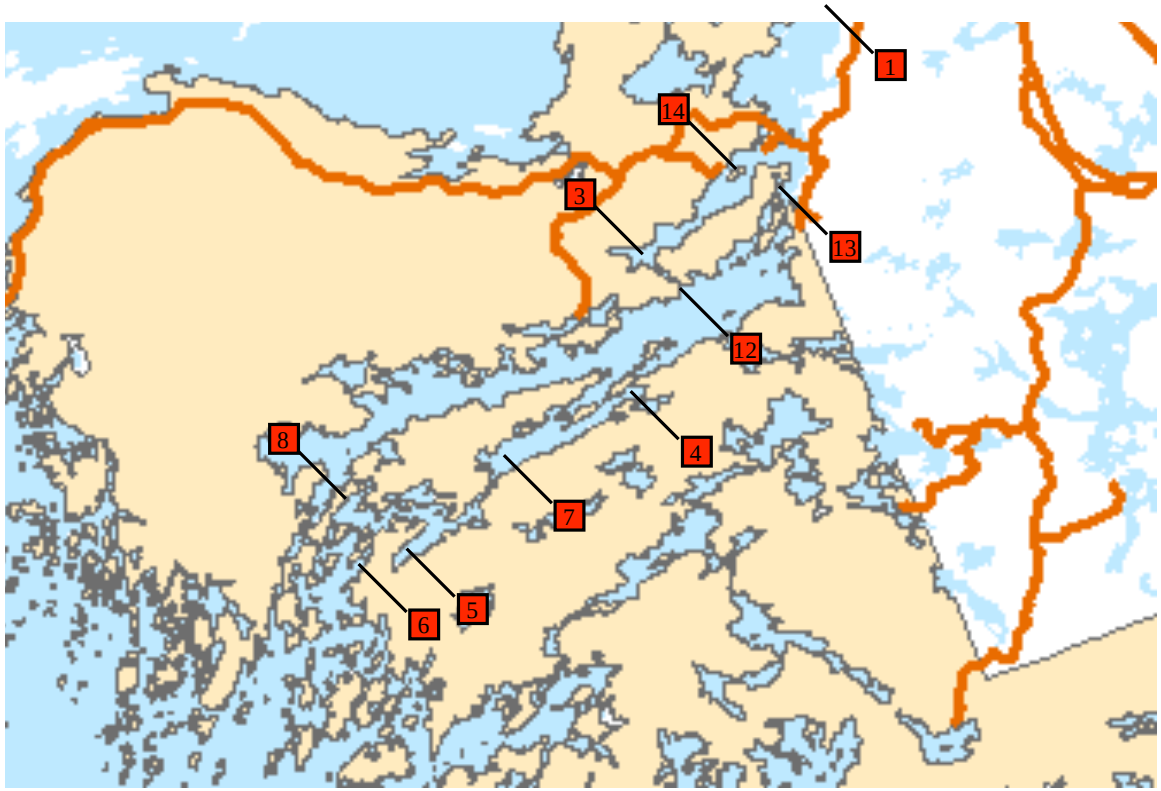
Sampling sites have typically been focused on known or expected “hot spots”; areas that may be more likely to suffer water quality impairment related to human activities. Some sample areas have also been selected as control stations; these allow comparison between the variety of ecosystem types that 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.

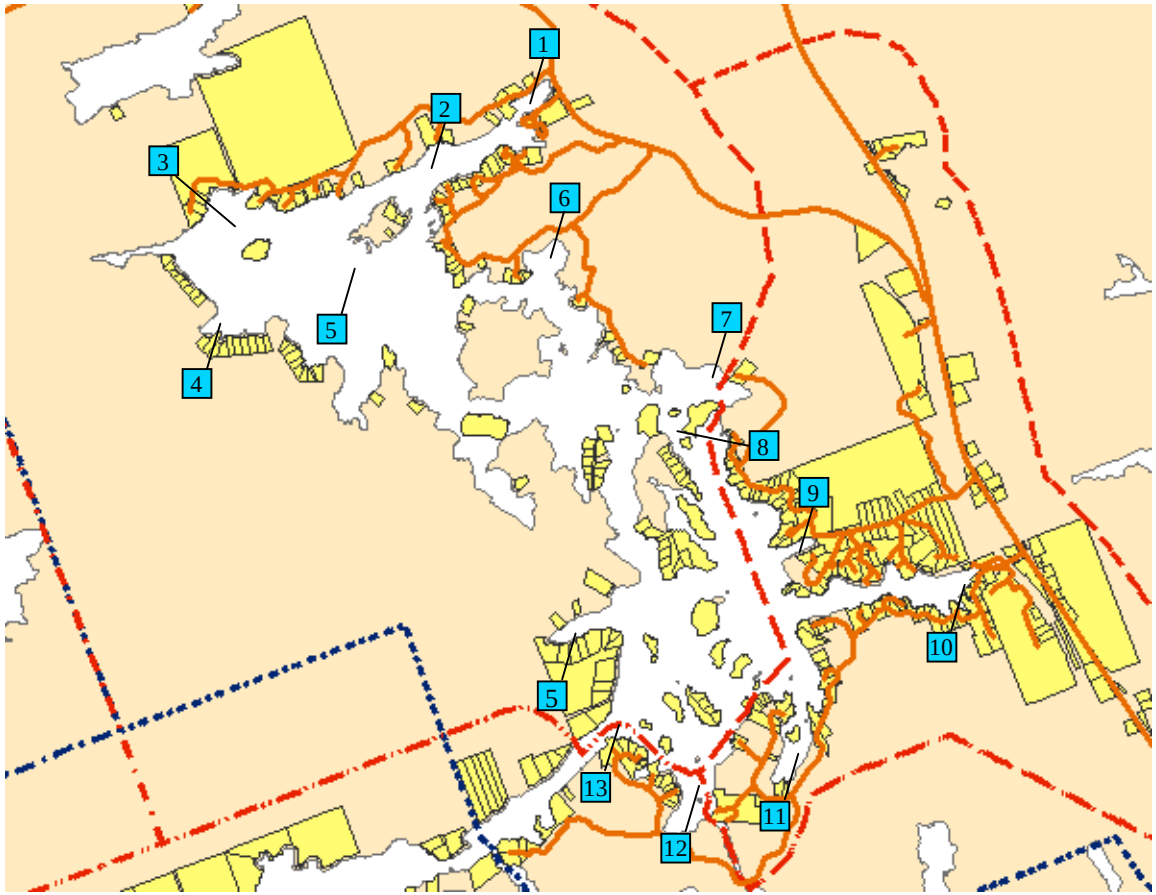
2.1.1 Sans Souci and Woods Bay Sampling Locations



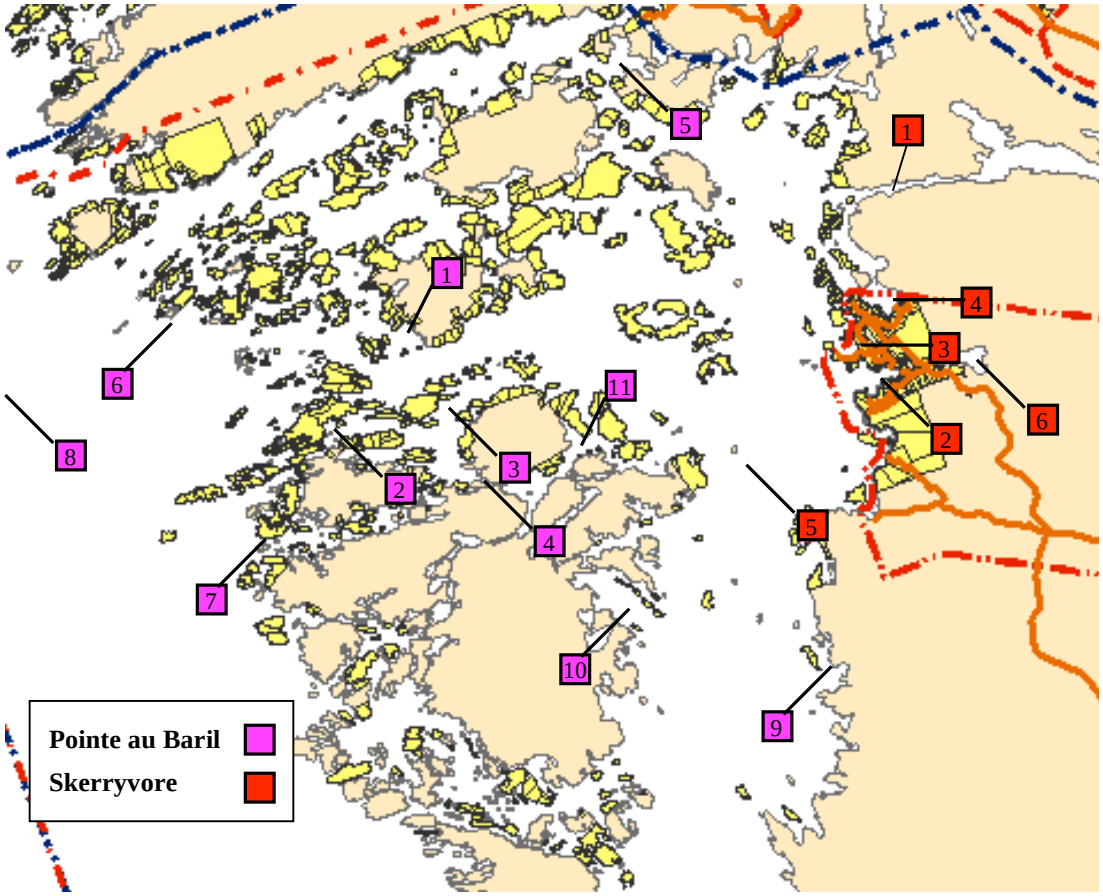
2.1.2 South Channel Sampling Locations



2.1.3 Sturgeon Bay Sampling Locations

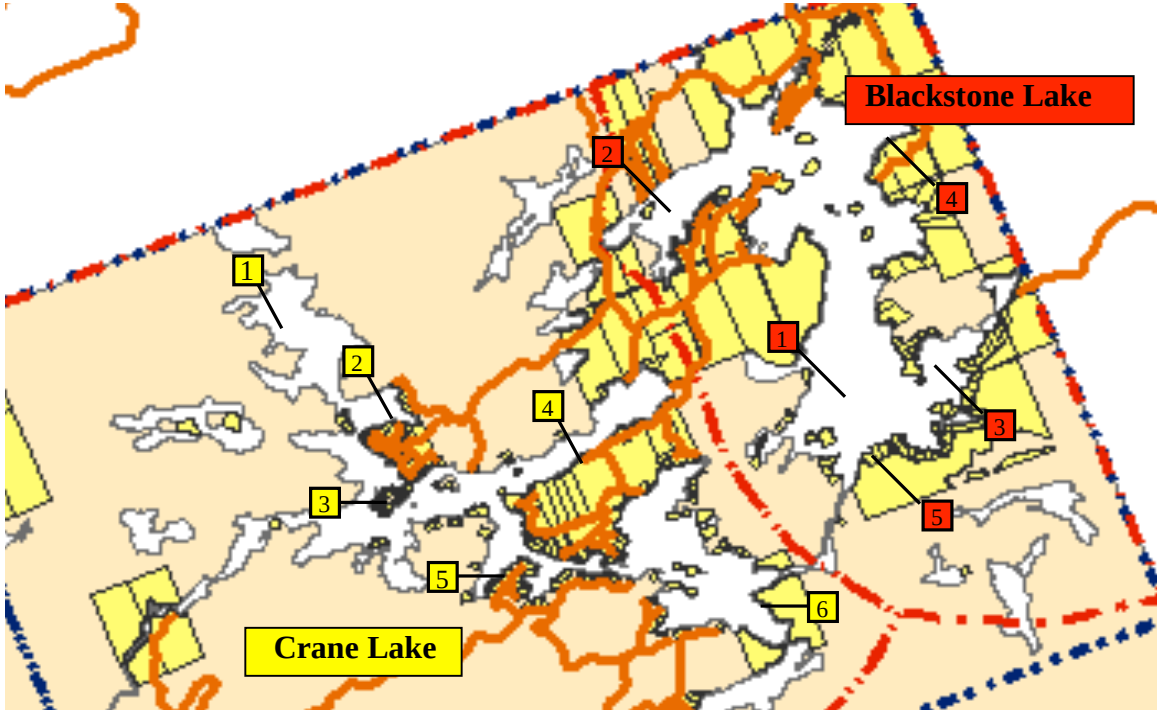


2.1.4 Skerryvore and Pointe au Baril Islands Sampling Locations



2.1.5 Bayfield Inlet and Nares Inlet Sampling Locations

2.1.6 Blackstone and Crane Lake Sampling Locations



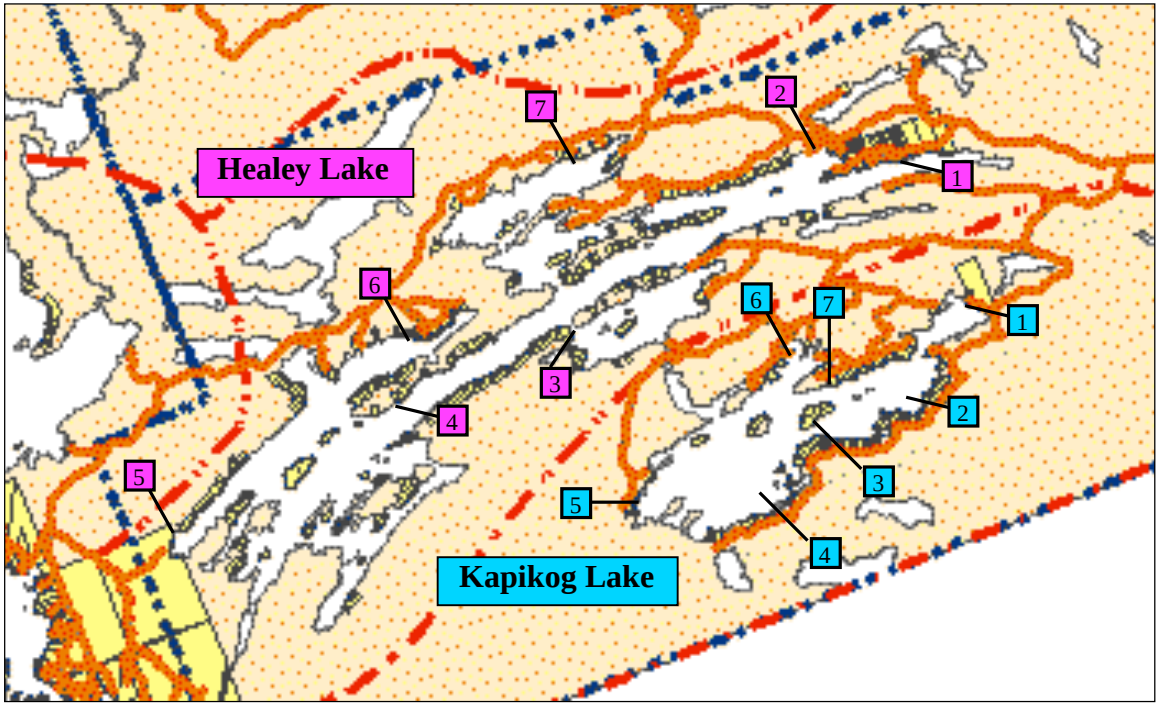
Blackstone Lake Sampling Sites:

1 Centre of Lake (Peanut Island) 2 McRoberts Bay 3 Lawson Bay(old)
4 Blackstone Landing 5 Mallet

Crane Lake Sampling Sites:

1 North End 2 Goebel's Bay 3 Aga Ming Private Dock/Mead Bay
4 Crane Lake Resort 5 Overflow Bay (Narrows) 6 South End

2.1.7 Healey Lake and Kapikog Lake Sampling Locations



2.1.8 Naiscoot Lake 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 is at the absolute limit of being visible. This depth is the Secchi depth of visibility, which is directly related to water clarity and can be used as a simple and effective monitoring tool for determining the effects of human activities on water clarity and, indirectly, on the nutrient content in the water. 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 (smaller Secchi depth values) in enclosed bays, near wetlands or sources of organic material, and in lakes or areas that have higher nutrient levels either for natural or unnatural causes. When examining the data, it is typical 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.

2.21 Secchi Depths (Water Clarity) in the Sans Souci Area

Water Clarity Results for 2011

Date	Station							Average for All Stations
	1	2	3	4	5	6	7	
10-Jul	9.1	N/A	N/A	N/A	N/A	10.7	4.9	8.2
25-Jul	9.5	9.5	N/A	8.8	N/A	10.7	4.9	8.7
09-Aug	10.7	10.7	N/A	4.6	5.8	12.2	6.1	8.4
22-Aug	9.5	9.1	N/A	7.5	N/A	12.5	5.8	8.9
Average	**9.7**	**9.8**	N/A	**7.0**	**5.8**	**11.5**	**5.4**	**8.6**
Std. Dev.	0.7	0.8	N/A	2.2	N/A	1.0	0.6	0.3

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Average Water Clarity Results for Previous Years

Year	Station							Average for All Stations
	1	2	3	4	5	6	7	
2010	10.9	11.6	NA	7.6	5.8	13.7	5.8	7.7
2009	9.0	7.8	t.b.	6.2	5.9	10.0	5.2	7.3
2008	7.8	7.4	NA	4.1	4.3	9.1	4.3	6.7
2007	8.8	4.7	3.3	5.0	6.0	10.9	4.3	6.2
2006	8.5	6.2	3.7	4.5	5.3	9.1	5.0	6.0
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	NA	NA	NA	NA	NA	NA	NA	7.8
2001	NA	NA	NA	NA	NA	NA	NA	8.5

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

2.2.2 Secchi Depths (Water Clarity) for Woods Bay Area

Water Clarty Results for 2011

Date	Station						Average for All Stations
	1	2	3	5	6	7	
27-Jun	3	3	4	4	3	4	3.5
11-Jul	3.5	3.5	3.5	4	4	4	3.8
26-Jul	3	3	3	4	4	3	3.3
08-Aug	3.5	3	4	4	4	4	3.8
22-Aug	4	4	4	4	4	4	4.0
12-Sep	4	3.5	4	4	4	4	3.9
26-Sep	4	4	4	4	4	4	4.0
Average	**3.6**	**3.4**	**3.8**	**4.0**	**3.9**	**3.9**	**3.8**
Std. Dev.	0.4	0.4	0.4	0.0	0.4	0.4	0.3

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Average Water Clarity Results for Previous Year

Year	Station						Average for All Stations
	1	2	3	5	6	7	
2009	3.4	3.3	3.1	3.2	3.7	3.8	3.4
2008	3.8	3.2	3.3	2.2	4	4.1	3.4
2007	3.3	N/A	2.8	4.2	4.2	4	3.7
2006	3.3	N/A		3.8	3.8	4	3.7
2005	2.8	N/A	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	N/A	3.2	N/A	N/A	3.8	4.2	3.7
2001	N/A	4.5	N/A	N/A	5.0	N/A	4.8

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Note: 2010 Data is unavailable.

2.2.3 Secchi Depths (Water Clarity) for the South Channel Area

Water Clarity Results for 2011

Date	Station										Average for All Stations
	1	3	4	5	6	7	8	12	13	14	
30-May	2.1	3.3	4.9	4.6	7	5.2	6.1	4	2.4	3	4.3
10-Jul	2.7	3	5.2	4.3	6.1	4.3	5.2	3.7	2.1	3	4.0
7-Aug	3	4	4.3	4.3	5.8	4.6	4.9	4.3	2.4	4	4.2
5-Sep	3	4.9	5.2	4.9	6.7	4.9	5.2	4.6	3.7	5.2	4.8
26-Sep	3.7	4.2	5.2	5.2	7	5.2	6.1	4.9	3.3	4.2	4.9
Average	**2.9**	**3.9**	**5.0**	**4.7**	**6.5**	**4.8**	**5.5**	**4.3**	**2.8**	**3.9**	**4.4**
Std. Dev.	0.6	0.8	0.4	0.4	0.5	0.4	0.6	0.5	0.7	0.9	0.4

Average Water Clarity Results for Previous Years

Date	Station										Average for All Stations
	1	3	4	5	6	7	8	12	13	14	
2009	3.2	3.8	5.1	4.9	7.0	4.7	5.9	4.7	3.0	4.2	4.6
2008	2.8	3.6	5.0	4.8	7.0	4.9	5.5	4.6	2.9	3.5	4.4
2006	3.1	3.8	5.5	4.4	6	4.7	5.8	5.1	3	3.6	4.5
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), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Note: 2010 Data is unavailable.

2.2.4 Secchi Depths (Water Clarity) for the Sturgeon Bay Area

Water Clarity Results for 2011

Date	Station														Average for All Stations
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
25-Jun	1.3	1.3	1.5	1.7	1.7	1.4	1.5	1.8	1.5	NA	1.9	1.9	2.2	1.9	**1.7**
14-Jul	2.1	2.3		2.6	3	N/A	2.5	N/A	N/A	N/A	3	3	3.5	3.4	**2.8**
28-Jul	1.5	1.5	1.3	1.7	1.7	1.3	2	1.8	2.2	NA	2.2	2.4	2.3	2.8	**1.9**
11-Aug	1.2	1.3	1.4	1.5	1.6		1.6	2	1.7	NA	1.9	2.1	2.3	2.3	**1.7**
10-Sep	1.2	1	1.1	1	1.2	1.2	1.8	2	2.1	NA	2.1	2.2	2.3	2	**1.6**
Average	**1.5**	**1.5**	**1.3**	**1.7**	**1.8**	**1.3**	**1.9**	**1.9**	**1.9**	**NA**	**2.2**	**2.3**	**2.5**	**2.5**	**2.0**
Std. Dev.	0.4	0.5	0.2	0.6	0.7	0.1	0.4	0.1	0.3	NA	0.5	0.4	0.5	0.6	**0.5**

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Average Water Clarity Results for Previous Years

Year	Station														Average for All Stations
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2010	**1.7**	**1.7**	**1.8**	**1.9**	**1.9**	**1.3**	**2.1**	**2.1**	**2.2**	**NA**	**2.3**	**2.4**	**2.3**	**2.0**	**2.0**
2009	1.3	1.4	1.6	1.4	1.6	1.5	1.5	1.7	1.6	1.0	1.6	1.9	1.8	1.8	1.5
2008	1.2	1.2	1.1	1.1	1.7	1.3	1.6	1.6	1.6	0.9	1.6	1.8	1.8	1.6	1.3
2007	1.6	1.5	1.7	1.7	1.7	t.b.	1.8	2.0	1.9	1.5	1.9	1.9	2.2	1.8	1.7
2006	1.7	1.8	1.7	1.7	1.8	2.0	2.4	2.2	2.2	1.3	2.5	2.5	2.6	1.7	1.9
2005	2.1	2.3	2.5	2.5	2.4	1.6	2.6	2.2	2.4	2.7	2.5	2.5	2.5	2.2	2.4
2004	1.9	2.0	1.9	1.9	2.0	1.6	2.2	2.2	2.6	2.0	2.6	2.3	2.7	2.4	2.0
2003	1.2	1.4	1.5	1.5	1.5	1.3	1.6	1.6	1.9	1.6	1.9	2.1	2.0	1.5	1.6
2002	0.6	NA	NA	NA	0.7	NA	NA	NA	NA	NA	2.1	NA	NA	NA	1.1
2001	1.2	NA	NA	NA	1.6	NA	NA	NA	NA	NA	2.8	NA	NA	NA	1.9

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

2.2.5 Secchi Depth (Water Clarity) in Skerryvore Area

Data unavailable for 2011

2.2.6 Secchi Depth (Water Clarity) in Point au Baril Islands Area

Water Clarity Results for 2011

Date	Station						Average for All Stations
	1	3	4	6	8	10	
3-Jul		8.5			4.6		6.6
18-Jul		7.8	4.4	5.3	4.3	5.2	5.4
1-Aug	5.2	6.3	4	5.5	4.1	3.7	4.8
15-Aug	4.8	8.5	4.4	4.4		4.4	5.3
29-Aug	4.6		3.7	4.7		4	4.3
Average	**4.9**	**7.8**	**4.1**	**5.0**	**4.3**	**4.3**	5.1
Std. Dev.	**0.3**	**1.0**	**0.3**	**0.5**	**0.3**	**0.7**	**0.9**

Average Water Clarity Results for Previous Years

Year	Station						Average for All Stations
	1	3	4	6	8	10	
2009	5.2	6.7	4.8	5.2	4.6	5.2	5.1
2008	4.4	8.1	4.2	N/A	N/A	3.3	5.0

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Note: 2010 Data is unavailable.

2.2.7 Secchi Depth (Water Clarity) in Blackstone Lake

Water Clarity Results for 2011

Date	Station					Average for All Stations
	1	2	3	4	5	
10-Jul	4.8	4.8	4.8	4.8	4.8	4.8
29-Jul	5.2	5.2	5.2	5.2	5.2	5.2
11-Aug	5.2	5.2	5.2	5.2	5.2	5.2
26-Aug	5.5	5.5	5.5	5.5	5.5	5.5
12-Sep	6	6	6	6	6.0	6.0
Average	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**	**5.3**
Std. Dev.	0.4	0.4	0.4	0.4	0.4	0.4

Average Water Clarity Results for Previous Years

Year	Station					Average for All Stations
	1	2	3	4	5	
2010	4.9	NA	NA	NA	NA	NA
2009	4.8	NA	NA	NA	NA	NA
2008	5.1	NA	NA	NA	NA	NA
2007	6.0	NA	6.0	NA	NA	NA
2005	5.4	4.7	5.8	5.3	4.6	5.1
2004	4.1	4.6	4.4	3.8	4.4	4.3
2003	4.7	4.5	4.8	4.9	4.2	4.6

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

2.2.8 Secchi Depth (Water Clarity) in Crane Lake

Water Clarity Results for 2011

Date	Station						Average for All Stations
	1	2	3	4	5	6	
2-Jul	4.1	4	4.4	4	4.3	4.7	4.3
17-Jul	5	4.9	5	5.1	5	4.8	5.0
31-Jul	5.1	4.8	5	4.8	4.8	4.8	4.9
13-Aug	5.1	4.8	5	5	5	5.5	5.1
5-Sep	5	4.8	5	4.5	4.6	4.3	4.7
18-Sep	5.1	5.1	4.9	4.9	5	4.5	4.9
Average	**4.9**	**4.7**	**4.9**	**4.7**	**4.8**	**4.8**	**4.8**
Std. Dev.	0.4	0.4	0.2	0.4	0.3	0.4	0.3

Average Water Clarity Results for Previous Years

Year	Station						Average for All Stations
	1	2	3	4	5	6	
2010	4.8	4.9	4.8	4.5	4.9	5.0	4.8
2009	4.8	4.6	4.7	4.5	4.3	5.0	4.6
2008	4.2	4.3	4.4	4.2	4.0	4.9	4.4
2007	5.3	4.8	4.6	4.2	4.2	5.1	4.7
2006	4.2	4.0	4.2	4.1	4.3	5.1	4.3
2005	4.7	4.7	4.7	4.5	4.8	4.8	4.7
2004	4.3	4.4	4.1	4.4	4.1	4.4	4.3
2003	2.6	2.6	2.6	2.5	2.8	2.9	2.7

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

2.2.9 Secchi Depth (Water Clarity) in Healey Lake

Water Clarity Results for 2011

Date	Station							Average for All Stations
	1	2	3	4	5	6	7	
09-Jul	3.0	3.0	3.0	3.4	3.4	3.0	1.8	2.9
06-Aug	3.0	3.	3.4	3.4	3.4	3.0	1.8	3.0
Late August	3.0	3.	3.4	3.4	3.4	3.0	1.5	3.0
Average	**3.0**	**3.0**	**3.3**	**3.4**	**3.4**	**3.0**	**1.7**	**3.0**
Std. Dev.	0.0	0.0	0.2	0.0	0.0	0.0	0.2	0.0

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

Average Water Clarity Results for Previous Years

Year	Station							Average for All Stations
	1	2	3	4	5	6	7	
2009	3.1	3.1	3.6	3.2	3.3	3.4	1.7	3.0
2008	2.7	2.6	3	3.2	3	2.8	1.7	2.7
2007	3.3	3	3.5	3.4	3.1	3.2	1.7	3.0
2006	3.1	2.8	3.7	3.4	3.5	3.5	1.7	3.1
2005	3	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

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom
2010 Results unavailable.

2.2.10 Secchi Depth (Water Clarity) in Kapikog Lake

Water Clarity Results for 2011

Date	Station								Average for All Stations
	1	2	3	4	5	6	7	8	
07-Jul	4.6	4.8	4.6	4.6	4.4	4.6	4.9	4.6	4.6
01-Sep	4.6	5.2	5.2	5	5.2	5	5.2	5.2	5.1
Average	**4.6**	**5.0**	**4.9**	**4.8**	**4.8**	**4.8**	**5.1**	**4.9**	**4.9**
Std. Dev.	0.0	0.3	0.4	0.3	0.6	0.3	0.2	0.4	0.3

Average Water Clarity Results for Previous Years

Year	Station								Average for All Stations
	1	2	3	4	5	6	7	8	
2010	4.5	5.0	4.9	4.8	4.9	4.9	5.1	4.9	4.9
2009	4.3	4.3	4.2	NA	4.3	4.4	4.3	4.2	4.3
2008	4.0	4.1	4.0	NA	4.1	4.3	4.1	4.0	4.1
2007	3.7	3.8	3.9	NA	4.1	4.0	4.0	4.0	4.0
2006	4.0	4.0	3.9	NA	4.3	4.2	4.2	4.2	4.1
2005	4.3	4.5	4.3	NA	4.3	4.5	4.4	4.6	4.4
2004	3.8	3.7	4.2	NA	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

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

2.2.11 Secchi Depth (Water Clarity) in Naiscoot Lake

Water Clarity Results for 2011

Date	Station						Average for All Stations
	0	1	2	3	4	2a	
10-Jul	3.6	3.5	3.5	3	2.8	3.4	3.3
22-Jul	3.8	3.9	4.1	3.4	2.7	3.9	3.6
04-Aug	4.2	4.2	3.8	3.8	3.6	4	3.9
21-Aug	4.3	4.2	4.1	4	4	4.1	4.1
07-Sep	5.2	5.3	5.2	4.9	4.3	5.1	5.0
Average	**4.2**	**4.2**	**4.1**	**3.8**	**3.5**	**4.1**	**4.0**
Std. Dev.	0.6	0.7	0.6	0.7	0.7	0.6	0.6

Average Water Clarity Results for Previous Years

Year	Station						Average for All Stations
	0	1	2	3	4	2a	
2010	4.2	4.3	4.1	4.0	3.8	4.2	4.1
2009	3.4	3.7	3.3	3.2	3.2	3.5	3.4
2008	3.6	3.5	3.6	3.3	3.1	NA	3.4
2007	4.1	3.9	3.9	3.9	3.6	NA	3.9

Depths in metres (m), NA = Not Available, Std. Dev. = Standard Deviation, t.b. = visible to bottom

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; and
- 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. Also, provincial bacteria standards are intended to provide suitable standards with respect to human health risks.

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 location 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.

2.3.1 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Sans Souci Area

Bacterial Monitoring Results for 2011

Date	Station														Average 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
10-Jul	8	0	11	0	69	13	16	0	375	25	3	0	19	0	71.6	5.4
24-Jul	30	0	19	0	16	0	19	5	106	0	3	0	22	0	30.7	0.7
07-Aug	219	62	49	8	25	11	69	0	255	0	19	0	102	0	105.4	11.6
21-Aug	136	3	36	0	22	3	59	25	171	0	19	0	62	0	72.1	4.4
Average	**98.3**	**16.3**	**28.8**	**2.0**	**33.0**	**6.8**	**40.8**	**7.5**	**226.8**	**6.3**	**11.0**	**0.0**	**51.3**	**0.0**	**70.0**	**5.5**
Std. Dev.	98.0	30.5	17.1	4.0	24.3	6.2	27.2	11.9	116.1	12.5	9.2	0.0	39.1	0.0	30.6	4.5

Average Bacterial Monitoring Results for Previous Years

Year	Station														Average 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
2010 Avg	**219.4**	**2.2**	**90.0**	**3.6**	**82.0**	**9.2**	**83.6**	**7.8**	**142.2**	**5.8**	**34.2**	**0.0**	**65.8**	**4.2**	**102.5**	**4.7**
2010 SD	269.7	3.5	63.9	3.5	33.1	9.7	67.8	8.2	62.1	7.8	34.4	0.0	27.8	2.9	48.8	1.8
2009 Avg	**17.9**	**1.3**	**17.9**	**3.1**	**43.1**	**10.0**	**16.1**	**4.7**	**346.7**	**5.7**	**5.7**	**1.9**	**39.0**	**0.9**	**69.5**	**3.9**
2009 SD	13.7	1.6	22.7	1.7	49.6	23.0	10.3	9.2	408.0	7.6	6.0	3.3	30.4	1.5	69.6	4.2
2008 Avg	**347.9**	**14.6**	**36.0**	**1.0**	**41.8**	**3.0**	**30.4**	**3.5**	**124.1**	**23.5**	**8.0**	**0.4**	**100.5**	**1.4**	**98.4**	**6.8**
2008 SD	840.5	30.9	21.2	1.9	23.5	4.9	13.7	3.1	95.5	59.7	10.9	1.1	199.1	2.0	114.8	10.4
2007 Avg	**12.6**	**1.0**	**29.8**	**2.2**	**37.0**	**2.2**	**51.4**	**1.2**	**106.4**	**3.2**	**9.4**	**0.0**	**131.6**	**0.6**	**54.0**	**1.5**
2007 SD	8.6	2.2	32.5	2.2	37.6	2.2	36.8	1.6	126.0	5.6	9.1	0.0	154.8	1.3	38.6	1.2
2006 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**
2006 SD	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
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**
2005 SD	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**
2004 SD	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

Year	Station														Average 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
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**
2003 SD	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**
2002 SD	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**
2001 SD	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

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

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

Bacterial Monitoring Results for 2011

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
27-Jun	43	13	22	0	22	11	13	5	12	33	8	3	20.0	10.8
11-Jul	30	0	13	5	13	5	11	3	52	0	39	13	26.3	4.3
26-Jul	49	3	33	0	25	3	33	0	119	3	69	0	54.7	1.5
08-Aug	72	8	19	3	36	8	11	0	49	5	72	5	43.2	4.8
22-Aug	43	5	52	5	16	11	28	3	30	0	25	8	32.3	5.3
12-Sep	308	3	30	0	52	5	25	8	43	0	11	0	78.2	2.7
26-Sep	194	0	59	3	206	0	8	5	25	11	8	0	83.3	3.2
Average	**105.6**	**4.6**	**32.6**	**2.3**	**52.9**	**6.1**	**18.4**	**3.4**	**47.1**	**7.4**	**33.1**	**4.1**	**48.3**	**4.7**
Std. Dev.	105.4	4.6	17.1	2.3	68.8	4.1	10.0	2.9	34.7	12.0	27.8	4.9	24.9	3.0

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		5		6		7			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**48.4**	**11.3**	**25.7**	**4.1**	**46.2**	**22.3**	**49.2**	**17.0**	**33.6**	**12.8**	**181.3**	**20.3**	**64.7**	**15.1**

Year	Station												Average All Stations	
	1		2		3		5		6		7			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 SD	36.5	18.3	14.6	3.8	25.7	18.1	38.6	8.9	17.8	10.3	219.0	21.4	53.1	11.8
2008 Avg	**136.0**	**29.0**	**105.0**	**7.3**	**171.0**	**23.5**	**112.3**	**15.8**	**42.3**	**10.3**	**74.0**	**5.5**	**106.8**	**15.2**
2008 SD	81.6	31.9	91.7	5.9	100.9	8.6	55.6	10.5	16.5	8.5	26.1	3.8	44.1	6.9
2007 Avg	**53.8**	**9.6**	**108.3**	**18.3**	**77.0**	**30.4**	**48.5**	**12.8**	**171.0**	**5.5**	**43.3**	**9.3**	**85.2**	**16.3**
2007 SD	31.2	7.8	107.1	20.1	97.6	25.6	71.7	20.3	278.1	3.8	30.8	6.2	59.8	12.1
2006 Avg	**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**
2006 SD	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
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**
2005 SD	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**
2004 SD	199.3	3.5	54.6	3.9	27.8	8.2	49.6	5.5	209.9	10.7	49.7	7.5	49.7	7.5
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**
2003 SD	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**
2002 SD	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**
2001 SD	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

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*
2010 data unavailable

2.3.3 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E.Coli (EC) in the South Channel Area

Bacterial Monitoring Results for 2011

Date	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-May	213	25	40	3	8	0	11	0	5	0	13	0
10-Jul	166	22	52	3	36	3	5	0	11	0	19	3
7-Aug	317	19	132	3	62	3	33	0	59	3	76	3
5-Sep	2424	110	72	16	52	3	39	0	79	3	62	3
26-Sep	510	114	43	0	8	0	5	0	22	0	11	3
Average	**726.0**	**58.0**	**67.8**	**5.0**	**33.2**	**1.8**	**18.6**	**0.0**	**35.2**	**1.2**	**36.2**	**2.4**
Std. Dev.	958.4	49.4	38.0	6.3	24.8	1.6	16.2	0.0	32.2	1.6	30.5	1.3

Date	Station								Average All Stations	
	8		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-May	5	0	22	3	106	22	30	5	45.3	5.8
10-Jul	33	3	39	5	72	11	106	3	53.9	5.3
7-Aug	43	0	141	8	263	16	123	8	124.9	6.3
5-Sep	65	0	102	5	171	3	49	0	311.5	14.3
26-Sep	46	5	25	3	177	28	28	5	69.0	10.3
Average	**38.4**	**1.6**	**65.8**	**4.8**	**157.8**	**16.0**	**67.2**	**4.2**	**120.9**	**8.4**
Std. Dev.	22.0	2.3	53.1	2.0	73.6	9.7	44.4	2.9	111.0	3.8

Average Bacterial Monitoring Results for Previous Years

Year	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**187.5**	**23.3**	**53.3**	**4.8**	**54.8**	**1.0**	**14.0**	**0.8**	**21.3**	**0.0**	**38.7**	**2.2**
2009 SD	84.4	9.1	26.7	1.8	39.8	1.5	11.4	2.0	16.8	0.0	21.6	2.5
2008 Avg	**354.2**	**47.0**	**57.3**	**3.7**	**96.3**	**4.2**	**29.5**	**6.0**	**32.0**	**2.8**	**34.8**	**2.8**
2008 SD	255.4	53.5	24.3	4.8	129.4	8.8	44.9	13.3	31.5	4.3	30.4	2.9
2007 Avg	**1495.9**	**73.8**	**74.0**	**2.4**	**84.1**	**3.6**	**38.7**	**2.4**	**34.7**	**2.3**	**62.9**	**3.1**
2007 SD	1108.8	60.5	45.1	2.8	81.5	4.1	23.3	2.8	25.3	4.4	47.3	4.0

Year	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2006 Avg	**477.0**	**56.9**	**250.8**	**4.4**	**35.9**	**3.3**	**87.3**	**0.4**	**48.3**	**2.8**	**40.4**	**3.8**
2006 SD	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 Avg	**819.5**	**219.7**	**125.7**	**1.2**	**203.1**	**0.0**	**632.7**	**4.2**	**72.5**	**0.3**	**320.2**	**4.3**
2005 SD	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 Avg	**529.1**	**43.7**	**1114.3**	**8.2**	**1202.6**	**2.8**	**1115.9**	**2.7**	**833.3**	**4.2**	**901.9**	**1.1**
2004 SD	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 Avg	**677.9**	**38.0**	**48.3**	**5.0**	**26.1**	**0.9**	**94.6**	**14.0**	**353.3**	**0.0**	**374.1**	**1.7**
2003 SD	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 Avg	**1789.0**	**91.0**	**794.0**	**3.4**	**489.0**	**0.9**	**136.0**	**0.9**	**726.0**	**1.6**	**748.0**	**0.9**
2002 SD	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 Avg	**2148.0**	**113.0**	**860.0**	**11.9**	**1021.0**	**5.3**	**874.0**	**8.9**	**866.0**	**9.9**	**1139.0**	**3.0**
2001 SD	731.0	87.1	887.0	16.2	1009.0	10.1	1066.0	9.2	1081.0	9.0	1209.0	1.7

Year	Station								Average All Stations	
	8		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**59.8**	**3.7**	**63.7**	**5.8**	**138.7**	**30.5**	**82.7**	**3.3**	**69.0**	**8.7**
2009 SD	37.5	4.8	45.1	6.7	59.9	15.2	63.0	4.0	25.3	5.6
2008 Avg	**122.2**	**4.0**	**63.5**	**7.2**	**209.7**	**13.7**	**119.5**	**7.3**	**108.2**	**9.1**
2008 SD	181.5	4.1	37.5	7.3	125.3	10.1	130.8	7.4	37.4	4.3
2007 Avg	**107.6**	**4.0**	**87.4**	**10.6**	**178.2**	**19.0**	**64.3**	**2.6**	**222.8**	**12.4**
2007 SD	148.6	4.8	51.1	8.7	132.0	19.1	38.2	2.5	124.7	5.7
2006 Avg	**43.6**	**1.0**	**57.4**	**6.1**	**264.1**	**12.9**	**452.1**	**29.5**	**175.7**	**12.1**
2006 SD	47.0	1.9	57.5	7.9	375.8	10.5	807.2	60.3	145.0	9.2
2005 Avg	**271.4**	**3.2**	**69.1**	**2.7**	**61.7**	**7.8**	**70.0**	**1.0**	**278.8**	**25.5**
2005 SD	757.8	6.2	92.6	4.1	34.0	8.9	39.3	1.7	319.6	31.3

Year	Station								Average All Stations	
	8		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2004 Avg	**564.3**	**3.3**	**1408.6**	**10.7**	**1058.2**	**27.1**			**969.8**	**11.5**
2004 SD	763.6	5.1	1205.3	13.1	1059.2	52.5			609.6	6.9
2003 Avg	**23.4**	**0.4**	**450.9**	**6.0**	**77.1**	**8.6**			**231.2**	**8.0**
2003 SD	24.6	1.1	883.3	4.5	39.1	9.5			213.4	5.8
2002 Avg	**631.4**	**2.4**	**462.0**	**14.6**	**1210.0**	**17.7**			**780.0**	**14.0**
2002 SD	923.3	1.8	870.0	14.2	972.0	21.1			961.0	32.0
2001 Avg	**375.0**	**3.0**	**998.0**	**11.0**	**1330.0**	**27.4**			**1067.9**	**21.5**
2001 SD			999.0	11.1	1039.0	34.5			142.1	27.9

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*
2010 data unavailable

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

Bacterial Monitoring Results for 2011

Date	Station															
	1		2		3		4		5		6		7		8	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
25-Jun	289	30	233	33	141	22	247	83	76	3	255	33	226	25	102	13
14-Jul	28	3	43	3	22	8	16	0	11	0	146	5	69	11	83	5
28-Jul	136	0	132	5	194	25	46	5	188	5	219	3	255	11	76	5
11-Aug**	418	13	127	3	36	3	87	8	65	0	177	3	350	13	188	16
10-Sep	1370	8	858	8	1370	5	1174	5	2424	0	2424	3	2424	11	534	3
Average	**448.2**	**10.8**	**278.6**	**10.4**	**352.6**	**12.6**	**314.0**	**20.2**	**552.8**	**1.6**	**644.2**	**9.4**	**664.8**	**14.2**	**196.6**	**8.4**
Std. Dev.	536.2	11.8	330.8	12.8	573.3	10.2	488.9	35.2	1048.0	2.3	995.8	13.2	988.6	6.1	193.8	5.7

Date	Station												Average All Stations	
	9		10		11		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
25-Jun	289	11	375	19	119	13	280	19	110	19	171	13	208.1	24.0
14-Jul	65	8	72	8	43	5	62	5	19	0	94	8	55.2	4.9
28-Jul	177	33	123	8	102	0	161	8	177	0	177	19	154.5	9.1
11-Aug**	94	5	619	28	136	5	188	25	87	8	87	8	189.9	9.9
10-Sep	226	0	339	3	102	3	2424	0	1696	3	2424	16	1413.5	4.9
Average	**170.2**	**11.4**	**305.6**	**13.2**	**100.4**	**5.2**	**623.0**	**11.4**	**98.3**	**6.8**	**132.3**	**12.0**	**151.9**	**12.0**
Std. Dev.	92.4	12.7	219.1	10.1	35.0	4.8	1009.8	10.3	65.2	9.0	48.4	5.2	68.2	8.3

Average Bacterial Monitoring Results for Previous Years

Year	Station															
	1		**2**		**3**		**4**		**5**		**6**		**7**		**8**	
	TC	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**	**TC**	**EC**
2010 Avg	**1242.5**	**7.5**	**656.3**	**4.5**	**912.0**	**4.8**	**148.5**	**5.5**	**664.8**	**4.0**	**297.8**	**7.5**	**240.5**	**14.5**	**269.5**	**2.8**
2010 SD	1365.0	8.3	1179.8	3.3	1144.3	9.5	149.2	9.1	1174.0	6.2	428.4	11.9	308.3	12.2	446.3	3.8
2009 Avg	**1105.5**	**4.8**	**84.0**	**9.0**	**633.0**	**6.3**	**650.8**	**7.5**	**67.8**	**1.5**	**1264.5**	**28.0**	**1574.0**	**4.8**	**312.3**	**27.5**

Year	Station															
	1		2		3		4		5		6		7		8	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 SD	1143.5	2.4	64.3	13.2	1194.1	5.6	1182.4	5.2	57.0	1.7	1339.4	35.4	996.9	4.6	420.2	44.7
2008 Avg	**78.0**	**7.5**	**44.0**	**3.5**	**85.0**	**10.5**	**132.0**	**1.5**	**17.8**	**2.0**	**70.0**	**13.8**	**71.3**	**8.0**	**72.0**	**5.3**
2008 SD	27.9	7.3	4.4	5.2	55.0	19.1	191.1	1.7	12.2	4.0	49.8	17.3	47.4	5.7	21.6	5.6
2007 Avg	**507.5**	**35.0**	**60.5**	**8.8**	**193.8**	**8.3**	**137.0**	**9.0**	**69.3**	**2.0**	**100.0**	**6.8**	**137.0**	**24.8**	**152.8**	**15.8**
2007 SD	793.5	28.7	55.4	8.2	217.9	11.8	110.2	18.0	44.5	4.0	5.2	3.5	66.1	32.2	177.0	15.3
2006 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**	**225.2**	**22.8**	**127.8**	**43.8**
2006 SD	267.0	21.6	947.8	277.1	55.8	21.5	60.8	22.3	175.1	140.9	164.0	27.4	242.7	16.3	111.2	74.2
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**	**105.6**	**18.9**	**46.1**	**11.3**
2005 SD	268.1	27.2	899.9	8.9	56.5	8.8	24.0	12.1	61.3	7.6	93.2	30.5	93.1	11.4	22.3	9.5
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**	**247.9**	**11.3**	**174.7**	**2.6**
2004 SD	135.6	3.6	487.5	2.0	619.3	4.9	385.7	2.1	146.8	1.1	48.0	3.7	330.5	12.6	235.7	3.4
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**	**332.8**	**2.6**	**688.0**	**1.6**
2003 SD	1133.1	6.6	807.9	3.7	1046.0	1.1	1190.7	2.0	1210.4	1.1	799.9	11.5	419.7	5.0	1077.9	3.1
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**	**226.0**	**6.0**	**212.0**	**11.6**
2002 SD	1066.0	10.4	1031.0	8.0	826.0	2.9	669.0	2.1	1229.0	3.9	569.0	6.1	332.0	6.0	193.0	16.8

Year	Station												Average All Stations	
	9		10		11		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**267.3**	**8.3**	**210.8**	**2.8**	**150.0**	**6.0**	**643.5**	**2.8**	**63.5**	**2.8**	**647.8**	**5.3**	**458.2**	**5.6**
2010 SD	447.8	8.5	201.9	3.8	240.4	3.5	1187.5	2.1	83.1	3.8	1184.5	2.1	557.2	4.5
2009 Avg	**122.0**	**9.0**	**671.5**	**21.3**	**100.0**	**4.0**	**78.0**	**7.5**	**63.8**	**4.0**	**172.5**	**2.8**	**492.8**	**9.8**
2009 SD	130.8	11.9	1168.7	25.0	85.7	3.4	74.8	10.4	34.8	1.2	225.5	2.1	194.8	10.4
2008 Avg	**82.5**	**13.0**	**82.8**	**6.8**	**83.8**	**2.0**	**49.3**	**4.0**	**40.8**	**3.3**	**100.5**	**5.3**	**72.1**	**6.2**
2008 SD	20.7	8.5	57.2	7.0	97.0	2.4	44.5	4.6	14.6	2.4	58.8	7.5	25.7	5.4
2007 Avg	**93.8**	**18.8**	**125.0**	**8.5**	**30.3**	**4.0**	**65.0**	**9.5**	**54.3**	**1.3**	**34.3**	**2.8**	**125.7**	**11.1**
2007 SD	39.0	27.2	54.1	7.3	5.5	3.4	29.7	10.0	39.2	2.5	10.4	2.1	81.7	10.5

Year	Station												Average All Stations	
	9		10		11		12		13		14			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2006 Avg	**218.8**	**47.8**	**783.2**	**98.0**	**346.2**	**8.2**	**139.8**	**10.5**	**72.0**	**3.8**	**507.3**	**26.7**	**254.6**	**37.4**
2006 SD	128.7	71.9	1019.4	106.6	662.3	10.1	108.7	6.8	31.7	3.2	940.0	23.2	208.5	52.8
2005 Avg	**117.7**	**16.3**	**277.4**	**17.6**	**48.0**	**9.0**	**56.0**	**18.4**	**74.6**	**12.9**	**34.7**	**7.3**	**118.6**	**14.2**
2005 SD	133.4	23.1	486.3	20.0	28.9	9.4	32.4	16.4	93.0	12.4	11.7	7.6	92.8	11.3
2004 Avg	**419.7**	**4.3**	**186.6**	**11.3**	**183.7**	**3.9**	**109.3**	**1.6**	**183.4**	**2.0**	**148.0**	**4.4**	**218.6**	**4.0**
2004 SD	884.3	1.9	132.8	10.0	248.2	4.4	111.3	2.1	299.9	2.0	161.7	4.4	250.5	1.6
2003 Avg	**664.3**	**11.5**	**914.6**	**6.8**	**508.4**	**4.3**	**742.4**	**5.1**	**519.8**	**3.0**	**1084.1**	**1.1**	**729.3**	**3.8**
2003 SD	1086.9	26.4	1036.3	11.5	888.3	8.1	1149.8	13.6	897.3	6.7	1254.5	3.0	836.4	5.5
2002 Avg	**186.0**	**11.5**	**204.0**	**6.0**	**355.0**	**4.8**	**209.0**	**6.8**	**145**	**3**	**328**	**8.2**	**456**	**6**
2002 SD	242.0	14.8	220.0	7.1	837.0	6.4	343.0	10.0	201	5	469	15.8	708	9.4

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SD = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

2.3.5 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Skerryvore Area

Bacterial Monitoring Results for 2011

Date	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
14-Jul	22	3	2.5	2.5	5	3	0	0	0	0	16	13	7.6	3.6
01-Aug	43	5	19	11	98	3	52	0	28	3	280	46	86.7	11.3
18-Aug	141	33	49	3	1038	13	62	3	79	0	2425	271	632.3	53.8
03-Sep	177	13	79	0	72	28	110	25	52	0	98	19	98.0	14.2
Average	**95.8**	**13.5**	**37.4**	**4.1**	**303.3**	**11.8**	**56.0**	**7.0**	**39.8**	**0.8**	**704.8**	**87.3**	**206.1**	**20.7**
Std. Dev.	75.0	13.7	33.8	4.8	491.4	11.8	45.1	12.1	33.7	1.5	1152.1	123.3	287.0	22.5

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**533.2**	**5.4**	**56.2**	**1.8**	**94.8**	**5.2**	**52.6**	**8.2**	**60.8**	**1.0**	**238.0**	**37.0**	**172.6**	**9.8**
2010 SD	1058.1	5.1	45.6	1.6	49.8	3.3	26.5	7.4	76.5	2.2	74.7	36.9	196.8	6.5
2009 Avg	**73.0**	**13.2**	**71.5**	**3.5**	**239.8**	**9.2**	**56.7**	**18.8**	**30.0**	**0.5**	**294.2**	**27.8**	**127.5**	**12.2**
2009 SD	21.6	19.6	83.2	4.0	458.9	5.5	28.5	17.6	40.9	1.2	147.5	9.7	96.9	6.4
2008 Avg	**224.5**	**3.8**	**90.5**	**11.7**	**134.0**	**25.7**	**55.3**	**14.7**	**14.5**	**1.0**	**417.3**	**10.8**	**156.0**	**11.3**
2008 SD	307.9	3.2	115.5	23.4	180.7	35.4	48.4	14.3	9.0	1.5	473.2	7.1	69.8	9.2
2007 Avg	**395.5**	**6.0**	**49.0**	**2.3**	**93.3**	**13.3**	**78.5**	**18.5**	**22.2**	**1.0**	**994.5**	**125.3**	**272.2**	**27.8**
2007 SD	430.8	6.9	25.4	3.1	77.7	12.7	85.7	23.7	28.4	1.5	1109.7	119.4	153.7	22.6
2006 Avg	**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**
2006 SD	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**
2005 SD	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**
2004 SD	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

Year	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2003 Avg	**1037.8**	**7.4**	**77.4**	**1.6**	**104.4**	**5.4**	**58.0**	**9.4**	**105.6**	**2.1**	**209.7**	**25.5**	**259.2**	**7.8**
2003 SD	998.3	2.8	31.4	1.2	41.5	2.0	27.8	6.8	47.2	2.2	97.6	16.0	172.1	3.8
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**
2002 SD	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**
2001 SD	38.2	5.0	95.4	6.5	33.5	2.3	36.9	5.7	1064.0	1.3	792.0	49.9	461.5	18.8

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SD = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

2.3.6 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in the Pointe au Baril Islands Area

Bacterial Monitoring Results for 2011

Date	Station											
	1		2		3		4		5		6	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
3-Jul	13	5	5	0	0	0	30	13	11	5	8	0
18-Jul	110	22	200	171	30	0	136	30	123	46	127	25
1-Aug	33	3	106	5	171	11	271	5	72	11	28	3
15-Aug	55	0	127	5	30	0	69	0	76	0	59	3
29-Aug	79	0	200	0	136	13	72	0	65	0	46	11
Average	**58.0**	**6.0**	**127.6**	**36.2**	**73.4**	**4.8**	**115.6**	**9.6**	**69.4**	**12.4**	**53.6**	**8.4**
Std. Dev.	38.1	9.2	80.6	75.4	75.2	6.6	94.8	12.6	39.9	19.3	45.3	10.1

Date	Station										Average All Stations	
	7		8		9		10		11			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
3-Jul	8	0	16	0	11	0	36	11	8	0	13	3
18-Jul	94	8	62	8	87	19	62	3	87	11	102	31
1-Aug	106	8	226	52	36	5	52	3	72	0	107	10
15-Aug	83	0	55	0	52	0	76	0	16	3	63	1
29-Aug	114	5	375	8	98	8	156	3	213	0	141	4
Average	**81.0**	**4.2**	**146.8**	**13.6**	**56.8**	**6.4**	**76.4**	**4.0**	**79.2**	**2.8**	**85.3**	**9.9**
Std. Dev.	42.5	4.0	150.9	21.8	35.9	7.8	46.8	4.1	82.3	4.8	48.8	12.3

Average Bacterial Monitoring Results for Previous Years

Year	Station											
	1		2		3		4		5		6	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**41.4**	**2.8**	**67.6**	**6.8**	**17.8**	**1.8**	**116.6**	**2.8**	**68.4**	**4.2**	**99.4**	**11.4**
2009 SD	37.0	3.3	46.6	6.5	15.7	1.6	75.2	1.8	41.5	5.4	79.1	16.3
2008 Avg	**22.2**	**5.6**	**22.8**	**7.6**	**2.8**	**0.6**	**17.6**	**1.6**	**19.6**	**1.8**	**33.6**	**6.6**
2008 SD	20.7	7.6	15.6	2.9	3.3	1.3	11.5	2.3	10.1	1.6	27.5	4.1
2007 Avg	**16.4**	**5.4**	**39.0**	**3.4**	**23.4**	**6.2**	**21.4**	**5.4**	**37.6**	**6.0**	**53.0**	**17.0**
2007 SD	9.2	9.5	45.7	0.9	10.8	3.9	8.7	3.3	32.0	3.5	24.8	22.3
2006 Avg	**6.4**	**3.0**	**23.8**	**8.2**	**19.2**	**6.4**	**59.8**	**5.6**	**19.5**	**2.0**	**37.0**	**4.0**
2006 SD	4.2	0.0	11.4	8.0	12.3	4.2	33.7	1.3	9.4	2.4	20.1	1.2
2005 Avg	**176.4**	**17.4**	**54.8**	**19.6**	**494.8**	**2.2**	**45.5**	**9.0**	**34.5**	**2.0**	**376.6**	**8.2**
2005 SD	177.7	32.8	46.1	18.0	1079.1	2.2	61.3	11.2	40.0	2.4	739.0	12.3
2004 Avg	**564.1**	**9.6**	**441.0**	**6.4**	**526.7**	**7.4**	**417.1**	**24.3**	**468.0**	**14.0**	**455.4**	**96.7**
2004 SD	893.8	10.9	600.3	3.9	915.1	7.4	548.5	31.6	865.5	18.8	868.7	216.3
2003 Avg	**64.3**	**7.3**	**93.7**	**11.0**	**57.0**	**2.7**	**60.7**	**13.7**	**60.3**	**3.3**	**856.0**	**815.3**
2003 SD	29.2	12.7	46.1	12.2	23.1	2.5	30.0	14.4	33.4	2.9	1357.9	1393.1
2002 Avg	**56.3**	**3.0**	**135.0**	**2.7**	**47.7**	**3.7**	**52.0**	**1.7**	**58.3**	**3.3**	**60.0**	**3.7**
2002 SD	41.0	0.0	196.0	4.6	22.3	1.2	39.3	2.9	56.1	2.9	12.3	4.0
2001 Avg	**178.0**	**0.5**	**40.3**	**5.8**	**21.3**	**1.0**	**55.7**	**9.7**	**28.5**	**2.3**	**136.0**	**10.5**
2001 SD	335.6	1.2	28.1	9.5	17.5	1.5	29.8	7.0	13.8	2.0	237.0	20.4

Year	Station										Average All Stations	
	7		8		9		10		11			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**49.0**	**1.6**	**94.2**	**19.4**	**113.0**	**8.8**	**64.6**	**11.4**	**103.5**	**7.5**	**75.0**	**7.0**
2009 SD	24.3	3.6	80.3	17.2	91.9	3.5	53.1	14.6	90.8	10.4	38.5	6.2
2008 Avg	**24.2**	**2.6**	**18.0**	**5.0**	**58.0**	**12.6**	**9.0**	**1.6**	**16.6**	**3.2**	**22.2**	**4.4**
2008 SD	22.3	2.5	9.9	6.3	64.0	14.8	5.4	2.3	8.4	4.9	6.8	2.0

Year	Station										Average All Stations	
	7		8		9		10		11			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2007 Avg	21.8	2.2	5.0	0.0	20.6	1.8	28.0	1.0	62.2	1.8	**29.9**	**4.6**
2007 SD	12.6	3.5	8.0	0.0	18.3	1.6	11.0	2.2	78.4	1.6	12.2	2.3
2006 Avg			**0.8**	**0.0**	**41.8**	**3.4**					**25.8**	**4.2**
2006 SD			1.5	0.0	14.9	2.9					9.4	1.1
2005 Avg			**7.8**	**1.2**	**508.4**	**7.0**					**211.0**	**8.3**
2005 SD			10.0	1.6	1071.0	7.0					374.5	7.5
2004 Avg			**61.2**	**0.6**	**976.9**	**23.4**					**493.4**	**23.5**
2004 SD			54.4	1.3	1043.9	27.1					530.4	32.0
2003 Avg					**643.0**	**46.7**					**262.1**	**128.6**
2003 SD					913.0	74.0					333.3	215.6
2002 Avg					**187.0**	**41.7**					**85.2**	**8.5**
2002 SD					56.7	5.1					86.7	14.2
2001 Avg					**1624.0**	**812.0**					**297.7**	**120.3**
2001 SD					1239.0	1249.0					445.3	469.5

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SD = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

2010 data unavailable

2.3.7 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Bayfield and Nares Inlets

Bacterial Monitoring Results for 2011

Date	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-Jun	16	3	30	0	28	5	350	19	156	30	106	22	114.3	13.2
20-Jul	33	5	22	0	2424	13	59	3	25	0	25	0	431.3	3.5
02-Aug	72	5	25	0	2424	5	76	0	65	0	25	0	447.8	1.7
25-Aug	123	19	200	5	794	28	46	3	30	0	36	0	204.8	9.2
Average	**40.3**	**4.3**	**25.7**	**0.0**	**1625.3**	**7.7**	**161.7**	**7.3**	**82.0**	**10.0**	**52.0**	**7.3**	**439.6**	**2.6**
Std. Dev.	28.7	1.2	4.0	0.0	1383.3	4.6	163.3	10.2	67.1	17.3	46.8	12.7	11.7	1.3

Note: Stations 4, 5 & 6 were sampled on June 25, July 31, Aug 28, & September 18th

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**69.0**	**4.3**	**24.7**	**1.0**	**197.7**	**2.0**	**91.7**	**3.7**	**68.3**	**3.7**	**49.7**	**2.0**	**78.8**	**1.4**
2010 SD	59.0	4.0	7.6	1.7	160.6	1.7	65.5	4.0	27.7	6.4	34.2	1.7	37.9	0.6
2009 Avg	**22.5**	**0.8**	**37.5**	**0.8**	**26.5**	**0.8**	**17.8**	**0.0**	**59.5**	**4.0**	**93.0**	**6.5**	**30.3**	**2.2**
2009 SD	23.6	1.7	43.2	1.7	41.8	1.7	15.6	0.0	54.4	6.8	58.6	4.6	19.0	2.3
2008 Avg	**19.0**	**7.3**	**23.7**	**5.3**	**20.7**	**5.7**	**25.0**	**3.0**	**13.0**	**0.0**	**12.0**	**0.0**	**20.3**	**4.9**
2008 SD	12.2	7.5	9.3	5.5	8.1	4.6	4.2	0.0	0.0	0.0	1.4	0.0	6.8	4.5

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

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

Bacterial Monitoring Results for 2011

Date	Station										Average All Stations	
	1		2		3		4		5			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
10-Jul	1696	5	52	8	30	8	219	0	127	3	424.8	4.8
29-Jul	375	0	182	3	339	0	1174	13	171	3	448.2	3.8
11-Aug	1174	0	858	5	1370	3	1174	3	858	16	1086.8	5.4
26-Aug	200	0	317	0	141	3	240	5	451	0	269.8	1.6
12-Sep	72	3	65	3	36	0	141	0	194	3	101.6	1.8
Average	**703.4**	**1.6**	**294.8**	**3.8**	**383.2**	**2.8**	**589.6**	**4.2**	**360.2**	**5.0**	**466.2**	**3.5**
Std. Dev.	701.2	2.3	332.5	2.9	565.6	3.3	534.8	5.4	305.7	6.3	373.7	1.7

Average Bacterial Monitoring Results for Previous Years

Year	Station										Average All Stations	
	1		2		3		4		5			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**550.4**	**1.6**	**599.4**	**3.2**	**644.0**	**3.8**	**1360.6**	**1.6**	**661.8**	**3.4**	**763.2**	**2.7**
2010 SD	1048.6	3.6	1024.3	3.4	1008.8	5.4	1164.5	3.6	992.9	2.9	960.7	2.6
2009 Avg	**570.0**	**3.5**	**813.3**	**1.3**	**351.0**	**6.3**	**1290.3**	**9.5**	**951.0**	**5.8**	**795.1**	**5.1**
2009 SD	570.7	3.3	1077.8	2.5	340.2	2.9	1310.1	8.6	1064.0	5.4	731.9	4.2
2008 Avg	**65.0**	**0.0**	**54.8**	**5.3**	**56.3**	**0.0**	**169.0**	**9.5**	**375.3**	**4.0**	**144.1**	**3.8**
2008 SD	59.5	0.0	46.7	5.6	57.8	0.0	260.1	7.9	663.7	3.4	202.9	1.1
2007 Avg	**92.7**	**7.3**	**99.5**	**15.5**	**144.3**	**6.0**	**258.3**	**15.3**	**161.3**	**22.0**	**163.5**	**15.0**
2007 SD	115.5	7.5	70.0	12.6	84.2	7.7	226.8	20.6	176.0	38.0	137.0	19.1
2006 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**
2006 SD	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**
2005 SD	648.3	0.0	1220.6	2.4	1132.9	1.7	846.3	1.5	360.6	1.5	799.8	0.7

Year	Station										Average All Stations	
	1		2		3		4		5			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
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**
2004 SD	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**
2003 SD	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**
2002 SD	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**	**NA**	**NA**	**20.2**	**3.1**
2001 SD	18.6	1.5	3.8	3.9	3.5	1.7	28.2	2.1	NA	NA	12.1	1.1

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*, NA = Not Available

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

Bacterial Monitoring Results for 2011

Date	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2-Jul	19	3	22	11	49	11	30	11	39	5	55	8	**36**	**8**
31-Jul	55	8	76	13	55	13	182	46	55	3	94	5	**86**	**15**
13-Aug	33	8	52	11	54	6	39	13	39	3	188	11	**68**	**9**
5-Sep	141	8	55	13	62	11	90	8	106	13	132	8	**98**	**10**
18-Sep	19	0	39	11	25	3	28	8	30	5	30	3	**29**	**5**
Average	**53**	**5**	**49**	**12**	**49**	**9**	**74**	**17**	**54**	**6**	**100**	**7**	**63**	**9**
Std. Dev.	51	4	20	1	14	4	66	16	31	4	63	3	30	4

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**36**	**5**	**60**	**9**	**55**	**17**	**64**	**9**	**104**	**14**	**79**	**5**	**66**	**10**
2010 SD	13	3	49	6	29	13	46	4	87	15	65	6	42	4
2009 Avg	45	3	86	10	47	5	56	8	74	14	83	7	**65**	**8**
2009 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2008 Avg	50	6	64	10	48	11	51	11	64	22	54	14	**55**	**12**
2008 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2007 Avg	135	16	101	19	70	19	112	25	64	25	60	13	**90**	**20**
2007 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2006 Avg	62	8	78	18	187	16	199	16	240	13	407	9	**196**	**13**
2006 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2005 Avg	795	8	913	10	502	9	555	9	585	8	844	7	**699**	**8**
2005 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2004 Avg	1105	4	1175	13	1081	7	1142	8	1077	7	1393	8	**1162**	**8**
2004 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2003 Avg	631	6	726	9	499	7	506	5	512	6	696	6	**595**	**6**
2003 SD	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

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

Bacterial Monitoring Results for 2011

Date	Station 1		2		3		4		5		6		7		Average All Stations	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
09-Jul	28	8	19	5	114	3	19	8	16	0	55	8	11	3	37.4	5.0
06-Aug	33	11	36	0	90	16	19	5	39	8	36	3	30	5	40.4	6.9
Late August	39	11	43	11	132	16	16	8	13	5	55	8	22	0	45.7	8.4
Average	**33.3**	**10.0**	**32.7**	**5.3**	**112.0**	**11.7**	**18.0**	**7.0**	**22.7**	**4.3**	**48.7**	**6.3**	**21.0**	**2.7**	**41.2**	**6.8**
Std. Dev.	5.5	1.7	12.3	5.5	21.1	7.5	1.7	1.7	14.2	4.0	11.0	2.9	9.5	2.5	4.2	1.7

Average Bacterial Monitoring Results for Previous Years

Year	Station 1		2		3		4		5		6		7		Average All Stations	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2009 Avg	**65.5**	**5.5**	**82.3**	**10.7**	**105.7**	**4.3**	**83.0**	**7.3**	**84.3**	**9.7**	**79.7**	**3.7**	**177.7**	**1.0**	**96.1**	**6.1**
2009 SD	9.2	7.8	35.9	7.4	58.6	1.2	63.7	4.0	61.4	2.9	12.7	1.2	94.6	1.7	44.3	2.0
2008 Avg	**11.0**	**4.0**	**15.7**	**2.3**	**17.0**	**2.3**	**13.0**	**1.7**	**16.3**	**3.0**	**46.3**	**1.0**	**14.7**	**3.3**	**19.1**	**2.5**
2008 SD	1.0	1.7	11.5	2.1	17.3	0.6	7.9	1.5	8.4	1.0	16.0	1.0	6.5	2.9	6.7	0.2
2007 Avg	**101.5**	**6.3**	**361.8**	**8.0**	**322.8**	**8.5**	**323.7**	**3.7**	**639.5**	**2.8**	**109.3**	**6.5**	**660.3**	**2.0**	**349.5**	**5.5**
2007 SD	99.5	10.6	389.1	5.8	225.1	4.1	169.0	4.0	1190.2	3.8	44.5	4.4	1176.8	4.0	400.7	3.2
2006 Avg	**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**
2006 SD	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**
2005 SD	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**
2004 SD	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**
2003 SD	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

Year	Station														Average 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
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**
2002 SD	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**
2001 SD	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

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. col*

2010 data unavailable

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

Bacterial Monitoring Results for 2011

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
7-Jul	11	11	5	5	3	0	19	16	11	5	8	5	59	22	8	3	15.5	8.4
14-Jul	83	0	938	0	654	8	740	3	2424	0	858	16	1696	5	938	3	1041.4	4.4
12-Aug	59	5	33	3	52	0	43	5	19	3	76	0	16	8	16	3	39.3	3.4
Average	**51.0**	**5.3**	**325.3**	**2.7**	**236.3**	**2.7**	**267.3**	**8.0**	**818.0**	**2.7**	**314.0**	**7.0**	**590.3**	**11.7**	**320.7**	**3.0**	**365.4**	**5.4**
Std. Dev.	36.7	5.5	530.8	2.5	362.5	4.6	409.5	7.0	1390.8	2.5	472.3	8.2	957.8	9.1	534.6	0.0	585.6	2.6

Average Bacterial Monitoring Results for Previous Years

Year	Station																Average All Stations	
	1		2		3		4		5		6		7		8			
	TC	EC	TC	EC	TC	EC	TC	TC	EC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**51.0**	**5.3**	**325.3**	**2.7**	**236.3**	**2.7**	**267.3**	**8.0**	**818.0**	**2.7**	**314.0**	**7.0**	**590.3**	**11.7**	**320.7**	**3.0**	**365.4**	**5.4**
2010 SD	36.7	5.5	530.8	2.5	362.5	4.6	409.5	7.0	1390.8	2.5	472.3	8.2	957.8	9.1	534.6	0.0	585.6	2.6
2009 Avg	**65.0**	**25.8**	**42.3**	**5.3**	**57.7**	**11.7**	**95.8**	**8.5**	**242.0**	**41.0**	**105.5**	**23.5**	**44.0**	**27.0**	**95.0**	**30.7**	**88.1**	**21.0**
2009 SD	40.2	45.5	35.5	5.5	29.7	9.1	94.2	13.1	257.8	30.6	59.5	25.3	34.8	33.0	57.2	15.0	48.8	11.9
2008 Avg	**1825.5**	**2.8**	**991.4**	**11.4**	**790.6**	**2.8**	**59.8**	**2.2**	**623.8**	**1.3**	**1520.3**	**6.3**	**1234.0**	**9.5**	**1015.0**	**1.6**	**879.2**	**5.4**
2008 SD	1197.0	2.1	1308.2	19.4	1077.0	1.8	68.5	2.2	1200.3	2.5	1138.5	5.6	1047.6	5.4	1289.0	2.3	790.3	4.4

Year	Station																Average All Stations	
	1		2		3		4		5		6		7		8			
	TC	EC	TC	EC	TC	EC	TC	TC	EC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2007 Avg	**214.2**	**19.0**	**69.8**	**9.5**	**597.6**	**11.6**	**167.0**	**1.0**	**548.4**	**3.2**	**93.8**	**3.8**	**708.5**	**8.8**	**506.0**	**13.8**	**345.2**	**10.2**
2007 SD	335.5	29.7	47.6	10.0	1025.6	10.5	350.6	2.2	1051.0	3.4	66.7	2.9	1152.6	6.7	1072.5	14.8	438.0	5.0
2006 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**
2006 SD	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**
2005 SD	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**
2004 SD	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**
2003 SD	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**
2002 SD	878.0	5.5	1136.0	7.0	54.0	3.6	865.0	16.3	892.0	6.0	1008.0	9.7	1160.0	3.3	878.0	4.4	883.0	8.2

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*

2.3.12 Bacterial Sampling of Surface Water for Total Coliforms (TC) and E. Coli (EC) in Naiscoot Lake

Bacterial Monitoring Results for 2011

Date	Station												Average All Stations	
	0		1		2		3		4		2a			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
10-Jul	8	0	11	0	25	0	19	0	25	3	33	0	20.2	0.5
22-Jul	16	0	19	3	11	0	177	3	19	3	22	8	44.0	2.8
04-Aug	13	3	19	0	3	3	76	5	36	3	8	0	25.8	2.3
21-Aug	16	0	36	3	16	0	90	3	59	0	19	3	39.3	1.5
07-Sep	11	0	11	0	22	0	106	11	132	3	28	3	51.7	2.8
Average	**12.8**	**0.6**	**19.2**	**1.2**	**15.4**	**0.6**	**93.6**	**4.4**	**54.2**	**2.4**	**22.0**	**2.8**	**36.2**	**2.0**
Std. Dev.	3.4	1.3	10.2	1.6	8.8	1.3	57.0	4.1	46.1	1.3	9.5	3.3	13.0	1.0

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		4		5		6			
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
2010 Avg	**21.0**	**2.4**	**41.2**	**2.8**	**48.0**	**2.2**	**67.4**	**3.2**	**92.0**	**3.8**	**39.6**	**2.6**	**51.5**	**2.8**
2010 SD	13.0	1.3	24.7	3.3	33.2	2.2	56.1	2.0	37.3	1.1	25.4	3.7	15.3	0.9
2009 Avg	**33.5**	**0.8**	**87.3**	**0.8**	**44.8**	**1.5**	**102.5**	**3.8**	**188.3**	**4.8**	**60.5**	**0.8**	**86.1**	**2.0**
2009 SD	23.6	1.5	41.2	1.5	19.5	1.7	54.0	2.5	121.5	4.6	35.7	1.5	25.1	0.4
2008 Avg	**48.3**	**7.5**	**42.8**	**5.5**	**50.5**	**8.0**	**83.5**	**2.3**	**196.0**	**4.8**	**NA**	**NA**	**79.8**	**4.8**
2008 SD	36.8	3.3	17.6	6.4	11.8	4.1	46.1	1.5	188.0	4.6	NA	NA	41.5	2.3
2007 Avg	**32.7**	**2.7**	**69.8**	**2.7**	**46.8**	**10.7**	**54.3**	**8.0**	**100.5**	**57.0**	**22.0**	**0.0**	**62.7**	**16.0**
2007 SD	12.2	4.6	35.8	2.5	25.5	2.5	20.7	9.8	57.5	98.7	NA	NA	26.3	23.3

* Recent light rain event, ** Recent heavy rain event, Std. Dev. or SC = Standard Deviation, Avg = Average, TC = Total Coliforms, EC = *E. coli*, NA = Not Available