

Volunteer Water Quality Monitoring Program Report on 2012 Sampling Data



**Township of The Archipelago
March 2013**

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 Glenda Clayton and Greg Mason - Georgian Bay GENERATIONS.

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1.0 Introduction

This report provides a summary of results from the 2012 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 2012 season. Similar to past reports, the purpose here is to present the data gathered in the 2012 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 2012. 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.

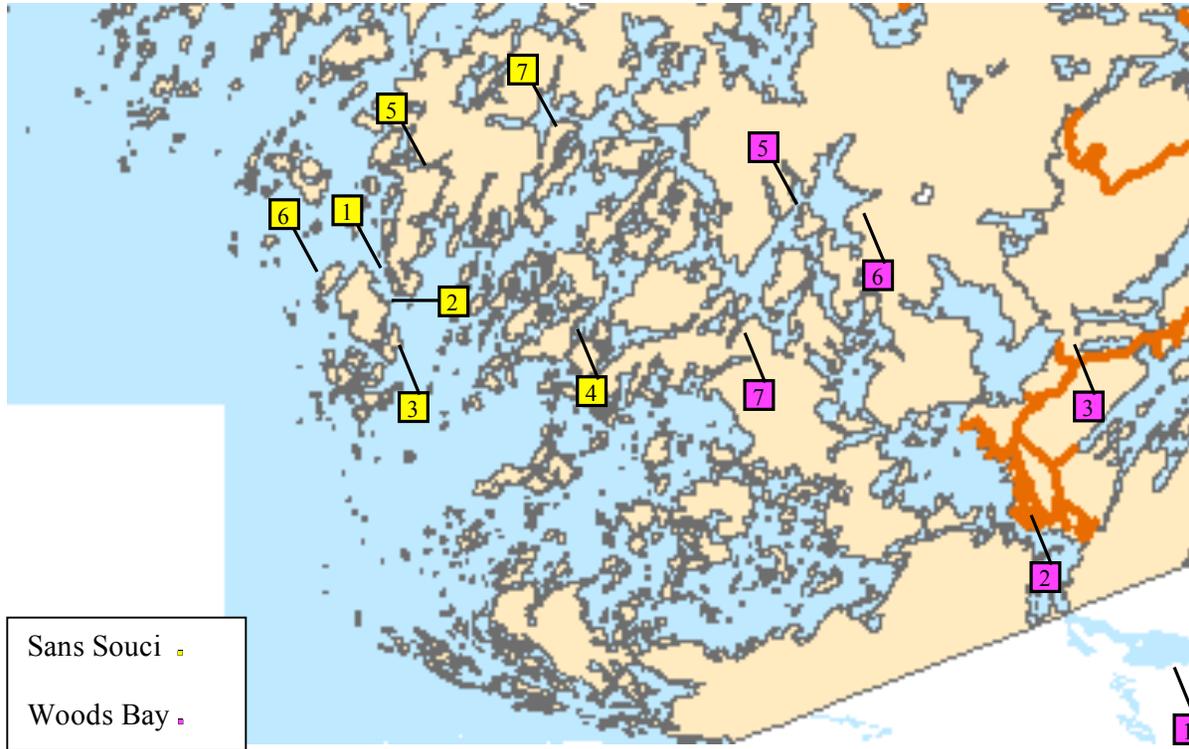
Charts are provided comparing water quality in the inland lakes, open bay sampling areas, and back bay sampling areas. When reviewing these data please keep in mind similarities and differences in the surrounding ecosystem and potential differences in sampling methodology (i.e. sampling times).

2.1 Sample Locations

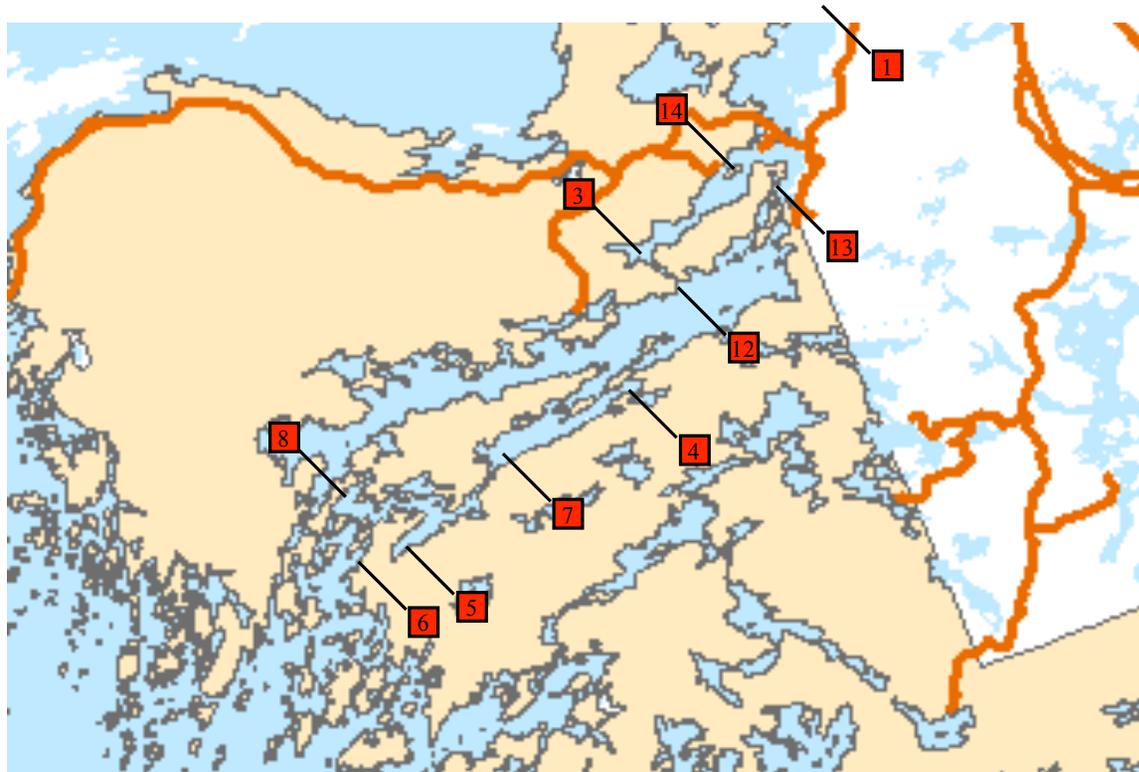
Sampling sites have typically been focused on known or expected “hot spots”; areas that may be more likely to suffer water quality impairment related to human activities. Some sample areas have also been selected as control stations; these allow comparison between the variety of ecosystem types that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

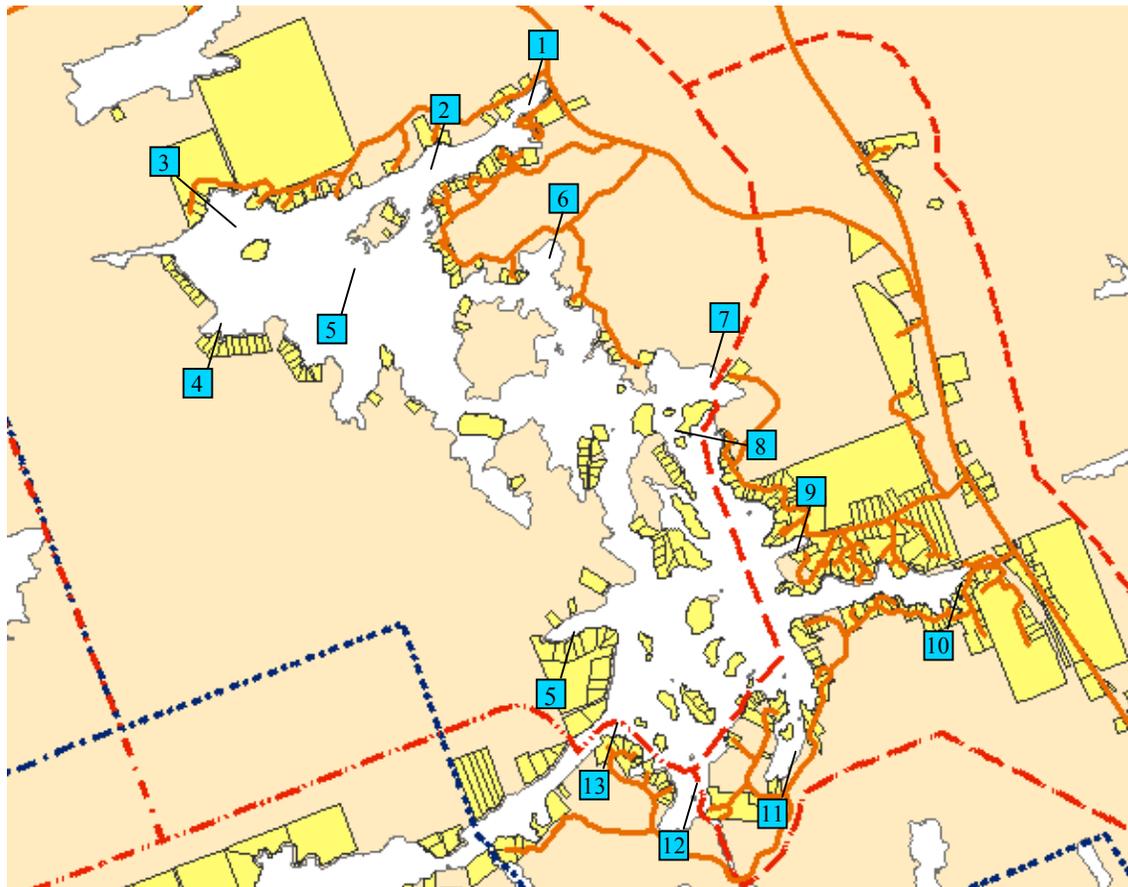
2.1.1 Sans Souci and Woods Bay Sampling Locations



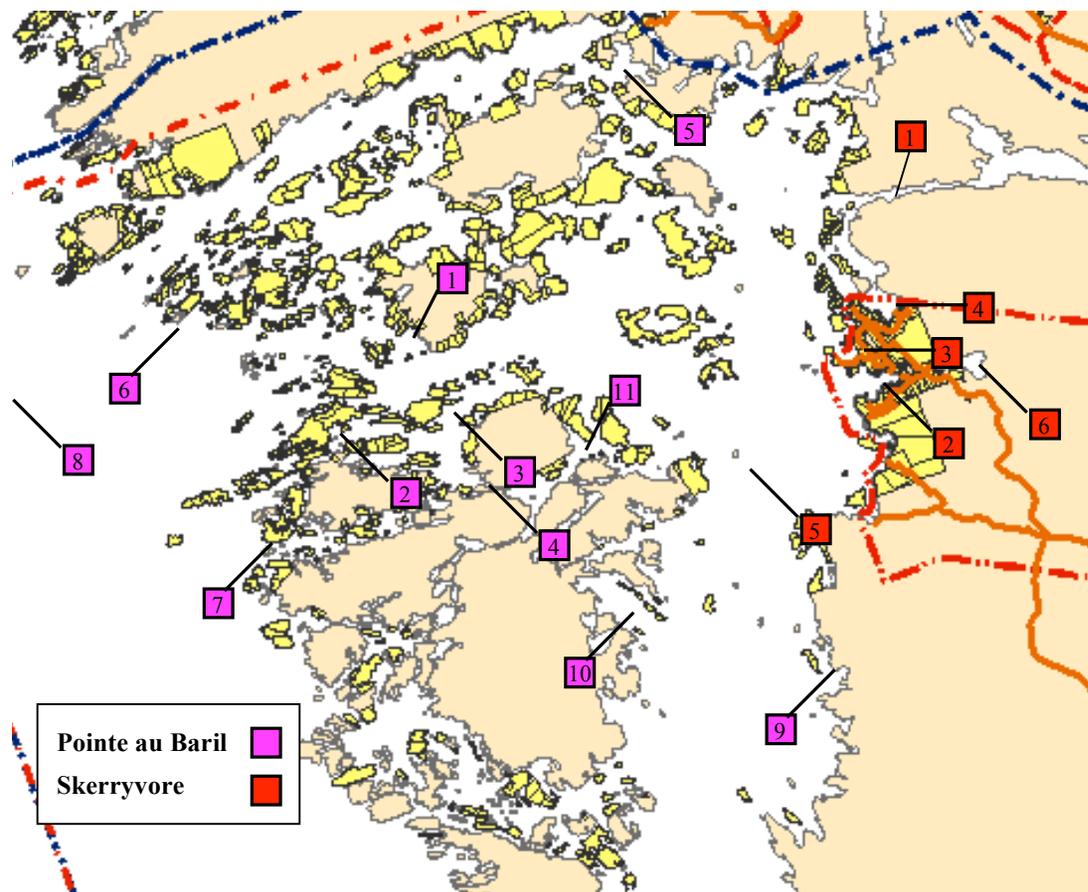
2.1.2 South Channel Sampling Locations



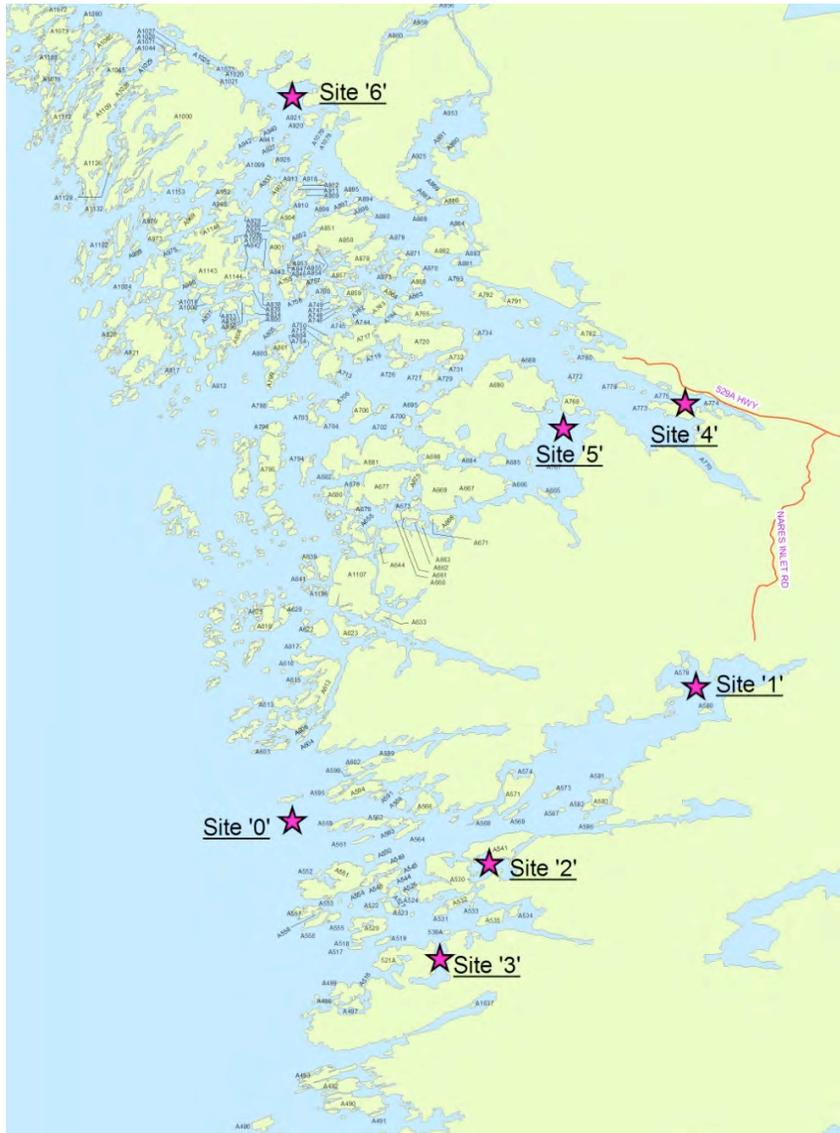
2.1.3 Sturgeon Bay Sampling Locations



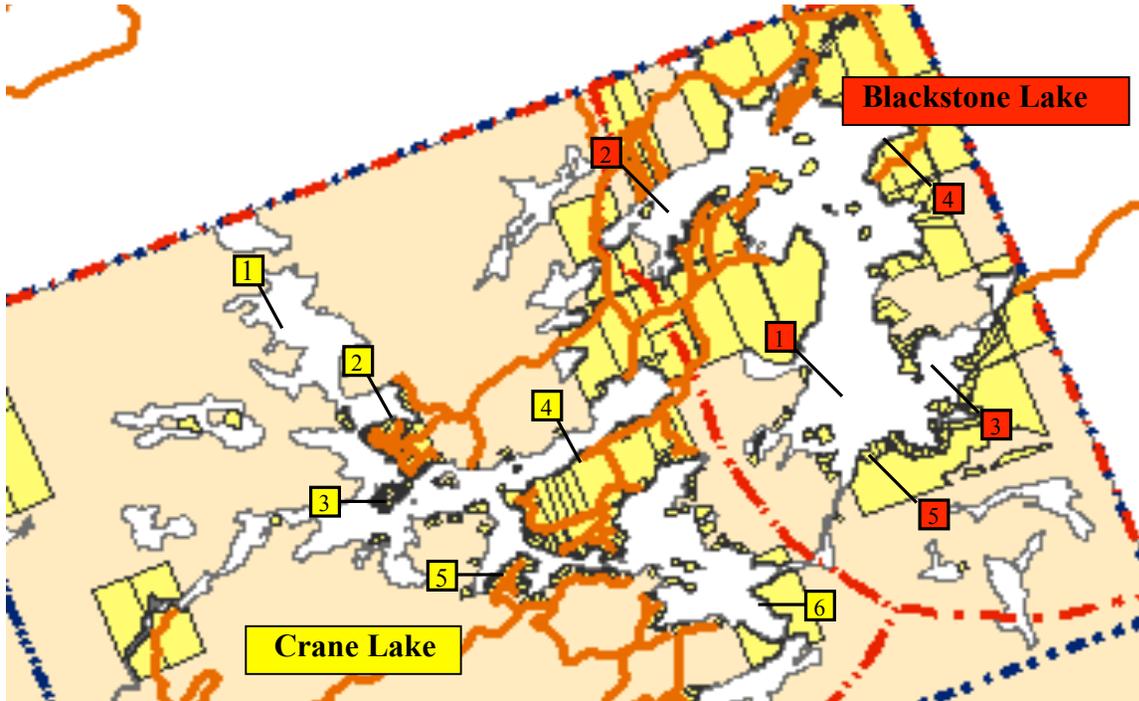
2.1.4 Skerryvore and Pointe au Baril Islands Sampling Locations



2.1.5 Bayfield Inlet and Nares Inlet Sampling Locations



2.1.6 Blackstone and Crane Lake Sampling Locations



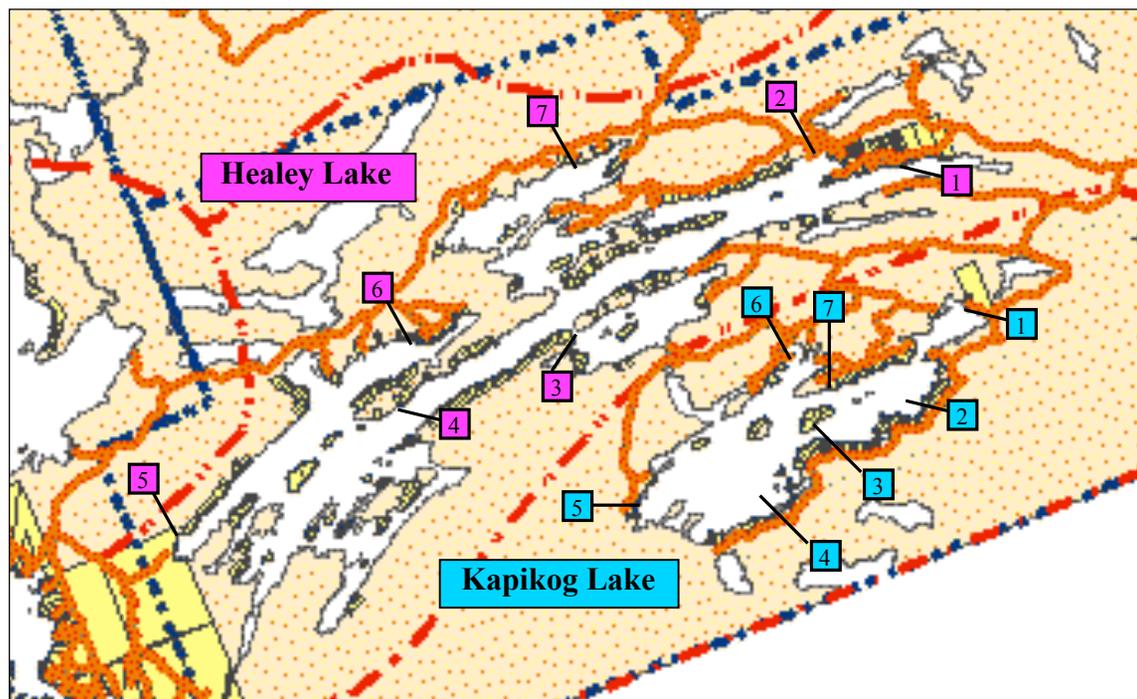
Blackstone Lake Sampling Sites:

- | | | |
|----------------------------------|-----------------|-------------------|
| 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 2012

Date	Station							Average for All Stations
	1	2	3	4	5	6	7	
2-Jul	10.6	NA	NA	9.1	NA	10.6	6.7	9.3
15-Jul	10.6	NA	NA	5.9	4.8	NA	6	6.8
29-Jul	NA	9	NA	7	NA	12.1	5.1	8.3
12-Aug	7.9	7.9	NA	5.1	NA	10.6	4.8	7.3
2-Sep	9.1	7.9	NA	6.4	NA	10.6	6	8.0
Average	9.6	8.3	N/A	6.7	4.8	11.0	5.7	7.9
Std. Dev.	1.3	0.6	N/A	1.5	0.0	0.8	0.8	1.1

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	
2011	9.7	9.8	N/A	7.0	5.8	11.5	5.4	8.6
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 Clarity Results for 2012

Date	Station						Average for All Stations
	1	2	3	5	6	7	
20-Jun	3.5	3.5	3	3.5	4	4	3.6
5-Jul	4	4	4	4	4	4	4.0
18-Jul	4	4	4	4	4	4	4.0
6-Aug	4	4	4	4	4	5	4.2
16-Aug	4	3	4	4	4	4	3.8
29-Aug	6	4	5	6	5	5	5.2
13-Sep	4	4	4	5	4	4	4.2
Average	4.2	3.8	4.0	4.4	4.1	4.3	4.1
Std. Dev.	0.8	0.4	0.6	0.9	0.4	0.5	0.5

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	
2011	3.6	3.4	3.8	4.0	3.9	3.9	3.8
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	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 2012

Date	Station										Average for All Stations
	1	3	4	5	6	7	8	12	13	14	
17-Jun	3.7	3.7	4.9	4.9	7.0	4.6	6.1	4.2	3.0	4.6	4.7
7-Jul	4.3	4.3	6.4	5.5	7.6	4.9	6.4	4.9	4.0	5.5	5.4
3-Aug	4.3	4.6	5.5	5.5	7.9	4.9	6.1	4.9	3.3	4.6	5.2
2-Sept	4.3	5.2	5.5	5.5	7.0	5.5	5.8	5.2	4.6	5.5	5.4
Average	4.2	4.5	5.6	5.4	7.4	5.0	6.1	4.8	3.7	5.1	5.2
Std. Dev.	0.3	0.6	0.6	0.3	0.4	0.4	0.2	0.4	0.7	0.5	0.2

Average Water Clarity Results for Previous Years

Date	Station										Average for All Stations
	1	3	4	5	6	7	8	12	13	14	
2011	2.9	3.9	5.0	4.7	6.5	4.8	5.5	4.3	2.8	3.9	4.4
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 2012

Date	Station														Average for All Stations
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
28-Jun	1.8	1.8	1.9	1.8	1.8	NA	1.6	2	2	NA	2	2	2.1	2	1.9
26-Jul	1.2	1.3	1.3	1.4	1.4	NA	1.4	1.5	1.6	1.4	1.7	1.8	2	1.7	1.5
12-Aug	1	1.05	1	1	1.05	0.95	1.8	1.8	1.8	NA	1.8	1.9	2.1	1.6	1.5
30-Aug	0.9	0.7	0.7	0.7	0.7	0.6	1.5	1.7	2	NA	2.1	2.3	2.4	1.8	1.4
11-Sep	0.4	0.5	0.5	0.6	0.5	0.5	1.2	1.3	1.3	NA	1.5	2.1	2	1	1.0
Average	1.1	1.1	1.1	1.1	1.1	0.7	1.5	1.7	1.7	1.4	1.8	2.0	2.1	1.6	1.5
Std. Dev.	0.5	0.5	0.5	0.5	0.5	0.2	0.2	0.3	0.3	NA	0.2	0.2	0.2	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 Years

Year	Station														Average for All Stations
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2011	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
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

Date	Station					
	1	2	3	4	5	6
3-Jul	2.1	3.6	1.2	1.5	4.8	0.5
17-Jul	2.4	3.3	1.2	2.4	4.5	0.5
6-Aug	2.4	3.9	0.9	2.7	4.5	0.5
18-Aug	3.3	3.3	1.5	2.4	4.5	0.5
Average	2.6	3.5	1.2	2.3	4.6	0.5
Std. Dev.	0.5	0.3	0.2	0.5	0.1	0.0

Average All Stations
2.3
2.4
2.5
2.6
2.4
1.3

Average Water Clarity Results for Previous Years

Year	Station					
	1	2	3	4	5	6
2011	NA	NA	NA	NA	NA	NA
2010	2.5	4.0	2.5	4.7		
2009	2.5	4.8	3.2	5.3		
2008						
Site 3						
2005	5.8	3.3	3.3	5.2	NA	NA
2004	3.6	4.5	3	4.5	NA	NA

Average for All Stations
NA
3.8
4.5
NA
4.3
3.9

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

Water Clarity Results for 2012

Date	Station										
	1	2	3	4	5	6	7	8	9	10	11
30-Jun	4.9	2.3	3.4	2.3	3.5	2.1	4.6	11.9	5.5	4	3.4
16-Jul	5	2.4	3.5	2.4	3.4	2	4.4	10.2	5	3.2	3.4
30-Jul	3.8	2.7	3	2.7	2.9	1.8	3.8	8.4	3.7	3.6	3.8
13-Aug	3.1	2.9	2.7	2.7	3.8	2	4.4	7.9	3.8	3.7	3.1
20-Aug	3.7	2.9	2.7	2.7	3.6	2.1	4.6	8.5	3.8	3.7	3.4
Average	4.1	2.6	3.1	2.6	3.4	2.0	4.4	9.4	4.4	3.6	3.4
Std. Dev.	0.8	0.3	0.4	0.2	0.3	0.1	0.3	1.7	0.8	0.3	0.2

Average for All Stations
4.6
4.1
3.7
3.6
3.8
4.0
0.4

Point au Baril Islands Area Average Water Clarity Results for Previous Years

Year	Station						Average for All Stations
	1	3	4	6	8	10	
2011	4.9	7.8	4.1	5.0	4.3	4.3	5.1
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 2012

Date	Station					Average for All Stations
	1	2	3	4	5	
10-May			4.0			4.0
4-Jul			5.0			5.0
21-Jul			5.0			5.0
7-Aug			5.6			5.6
22-Aug			5.8			5.8
6-Sep			6.0			6.0
Average			5.2			5.2
Std. Dev.			0.7			0.7

Average Water Clarity Results for Previous Years

Year	Station					Average for All Stations
	1	2	3	4	5	
2011	5.3	5.3	5.3	5.3	5.3	5.3
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 2012

Date	Station						Average for All Stations
	1	2	3	4	5	6	
1-Jul	4.9	4.8	4.5	4.3	5.1	4.7	4.7
21-Jul	5.5	5.3	5.1	5	5	5.2	5.2
6-Aug	5.9	5.6	5.9		4.9	5.4	5.5
19-Aug	6	5.9	5.1	5	5.1	6	5.5
3-Sep	6.3	5.9	5.9	5.6	5.1	6	5.8
26-Sep	5.4	5	4.9	4	4.6	5	4.8
Average	5.7	5.4	5.2	4.8	5.0	5.4	5.3
Std. Dev.	0.5	0.5	0.6	0.6	0.2	0.5	0.4

Average Water Clarity Results for Previous Years

Year	Station						Average for All Stations
	1	2	3	4	5	6	
2011	4.9	4.7	4.9	4.7	4.8	4.8	4.8
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 2012

Date	Station						
	1	2	3	4	5	6	7
27-Jul	3.4	3.0	3.7	3.4	3.4	3.4	2.1
10-Aug	3.4	3.0	3.4	3.4	3.4	3.4	2.1
8-Sep	3.4	3.1	3.7	3.4	3.4	3.4	1.8
Average	3.4	3.0	3.6	3.4	3.4	3.4	2.0
Std. Dev.	0.0	0.1	0.2	0.0	0.0	0.0	0.2

Average for All Stations
3.2
3.2
3.2
3.2
0.1

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						
	1	2	3	4	5	6	7
2011	3.0	3.0	3.3	3.4	3.4	3.0	1.7
2009	0.0	0.0	0.2	0.0	0.0	0.0	0.2
2008	2.7	2.6	3	3.2	3	2.8	1.7
2007	3.3	3	3.5	3.4	3.1	3.2	1.7
2006	3.1	2.8	3.7	3.4	3.5	3.5	1.7
2005	3	2.9	3.5	3.6	3.2	3.5	1.6
2004	2.9	3.2	3	3.3	3.2	3.2	1.1
2003	2.6	2.5	3	2.9	3.1	2.7	1.3

Average for All Stations
3.0
0.0
2.7
3.0
3.1
3.0
2.9
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 2012

Date	Station								Average for All Stations
	1	2	3	4	5	6	7	8	
30-Jul	4.6	5.2	5.5	4.9	5.2	4.9	4.9	5.2	5.1
28-Aug	4.6	4.9	5.2	4.9	5.5	4.6	5.2	4.9	5.0
Average	4.6	5.1	5.4	4.9	5.4	4.8	5.1	5.1	5.0
Std. Dev.	0.0	0.2	0.2	0.0	0.2	0.2	0.2	0.2	0.1

Average Water Clarity Results for Previous Years

Year	Station								Average for All Stations
	1	2	3	4	5	6	7	8	
2011	4.6	5.0	4.9	4.8	4.8	4.8	5.1	4.9	4.9
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 2012

Date	Station					
	0	1	2	3	4	2a
25-Jun	3.1	3.1	3.1	3.3	3	3.3
9-Jul	4.1	4.1	4.1	3.6	3.4	4
25-Jul	3.5	3.5	3.5	3.8	3.8	3.9
9-Aug	4.1	4.1	3.9	3.5	3.5	3.9
29-Aug	3.9	3.9	4.9	4.3	4	4.9
Average	3.7	3.7	3.9	3.7	3.5	4.0
Std. Dev.	0.4	0.4	0.7	0.4	0.4	0.6

Average for All Stations
3.2
3.9
3.7
3.8
4.3
3.8
0.4

Average Water Clarity Results for Previous Years

Year	Station					
	0	1	2	3	4	2a
2011	4.2	4.2	4.1	3.8	3.5	4.1
2010	4.2	4.3	4.1	4.0	3.8	4.2
2009	3.4	3.7	3.3	3.2	3.2	3.5
2008	3.6	3.5	3.6	3.3	3.1	NA
2007	4.1	3.9	3.9	3.9	3.6	NA

Average for All Stations
4.0
4.1
3.4
3.4
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 2012

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		
2-Jul	119	28	13	3	28	0	25	8	72	5	11	8	65	0	47.6	7.4
15-Jul	11	0	30	0	28	3	8	3	43	0	0	0	11	3	18.7	1.3
29-Jul	1370	65	25	0	33	3	49	5	30	13	3	0	22	0	218.9	12.3
12-Aug	188	8	62	0	65	5	194	33	161	39	5	0	72	8	106.7	13.3
2-Sep	156	3	22	0	39	0	39	3	52	5	16	0	39	0	51.9	1.6
Average	368.8	20.8	30.4	0.6	38.6	2.2	63.0	10.4	71.6	12.4	7.0	1.6	41.8	2.2	88.7	7.2
Std. Dev.	563.6	27.0	18.7	1.3	15.4	2.2	74.8	12.8	52.3	15.6	6.4	3.6	26.5	3.5	79.4	5.7

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		
2011 Avg	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
2011 SD	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
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

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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		
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
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 2012

Date	Station														Average All Stations	
	1		2		3		5		6		7		TC	EC		
	TC	EC														
20-Jun	98	16	33	8	13	0	13	5	19	8	11	0	31.2	6.2		
5-Jul	5	0	16	11	19	11	5	0	65	3	11	5	20.2	5.0		
18-Jul	78	11	30	5	39	13	87	5	240	5	36	11	85.0	8.3		
6-Aug	65	5	106	5	59	3	69	8	76	8	79	5	75.7	5.7		
16-Aug	200	3	69	0	28	5	16	0	25	11	13	5	58.5	4.0		
29-Aug	106	0	65	5	30	11	8	3	22	0	8	3	39.8	3.7		
13-Sep	59	0	52	0	11	5	16	3	28	0	8	3	29.0	1.8		
Average	87.3	5.0	53.0	4.9	28.4	6.9	30.6	3.4	67.9	5.0	23.7	4.6	48.5	5.0		
Std Dev	59.6	6.3	30.3	4.0	16.7	4.8	33.1	2.9	79.2	4.2	26.3	3.4	24.9	2.1		

Average Bacterial Monitoring Results for Previous Years

Year	Station												Average All Stations	
	1		2		3		5		6		7		TC	EC
	TC	EC												
2011 Avg	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
2011 SD	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
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
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 2012

Date	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
17-Jun	219	33	25	3	22	3	16	0	19	0	25	0
7-Jul	127	16	16	0	5	0	16	0	25	0	28	0
3-Aug	534	25	11	0	16	0	30	0	3	6	30	0
2-Sep	263	19	43	5	46	5	16	0	39	0	65	0
Average	285.8	23.3	23.8	2.0	22.3	2.0	19.5	0.0	21.5	1.5	37.0	0.0
Std. Dev.	174.9	7.5	14.1	2.4	17.3	2.4	7.0	0.0	14.9	3.0	18.8	0.0

Date	Station							
	8		12		13		14	
	TC	EC	TC	EC	TC	EC	TC	EC
17-Jun	36	0	22	3	151	30	28	3
7-Jul	36	3	30	0	90	13	19	3
3-Aug	19	0	28	8	123	3	98	0
2-Sep	16	3	49	0	62	3	46	0
Average	26.8	1.5	32.3	2.8	106.5	12.3	47.8	1.5
Std. Dev.	10.8	1.7	11.7	3.8	38.8	12.7	39.3	1.7

Average All Stations	
TC	EC
56.3	8.0
39.2	11.4
89.2	4.2
64.5	3.5
62.3	6.8
20.8	3.6

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
2011 Avg	726.0	58.0	67.8	5.0	33.2	1.8	18.6	0.0	35.2	1.2	36.2	2.4
2011 SD	958.4	49.4	38.0	6.3	24.8	1.6	16.2	0.0	32.2	1.6	30.5	1.3
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

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Year	Station											
	1		3		4		5		6		7	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
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
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		
2011 Avg	38.4	1.6	65.8	4.8	157.8	16.0	67.2	4.2	120.9	8.4
2011 SD	22.0	2.3	53.1	2.0	73.6	9.7	44.4	2.9	111.0	3.8
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

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Year	Station								Average All Stations	
	8		12		13		14		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC		
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
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 2012

Date	Station															
	1		2		3		4		5		6		7		8	
	TC	EC	TC	EC	TC	EC										
28-Jun	25	0	16	0	0	0	46	3	22	0	55	0	59	3	65	0
26-Jul	72	0	33	0	5	0	22	0	19	0	98	3	43	3	43	0
12-Aug	69	16	59	3	25	0	79	28	28	3	156	5	161	16	161	8
30-Aug	49	3	16	3	8	0	22	8	19	0	83	5	123	8	90	0
11-Sep	28	3	28	16	25	5	13	3	8	3	87	0	127	3	46	0
Average	48.6	4.4	30.4	4.4	12.6	1.0	36.4	8.4	19.2	1.2	95.8	2.6	102.6	6.6	81.0	1.6
Std. Dev.	22.1	6.7	17.6	6.7	11.7	2.2	26.8	11.3	7.3	1.6	37.2	2.5	49.7	5.7	48.5	3.6

Date	Station											
	9		10		11		12		13		14	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
28-Jun	28	0	46	0	16	0	30	0	19	0	59	3
26-Jul	25	0	76	3	13	0	28	0	69	3	43	11
12-Aug	72	5	469	16	69	3	156	13	110	5	52	5
30-Aug	94	3	146	0	39	5	43	3	33	0	36	0
11-Sep	39	3	55	0	49	3	33	3	25	0	16	0
Average	51.6	2.2	158.4	3.8	37.2	2.2	58.0	3.8	57.8	2.0	47.5	4.8
Std. Dev.	30.2	2.2	178.0	6.9	23.4	2.2	55.1	5.4	40.7	2.4	10.1	4.6

Average All Stations	
TC	EC
34.7	0.6
42.1	1.6
119.0	9.0
57.2	2.7
41.4	3.0
63.3	3.5
38.3	3.8

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
2011 Avg	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
2011 SD	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
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

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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 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
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
2011 Avg	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
2011 SD	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
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

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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		
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
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 2012

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		
3-Jul	8	5	76	16	30	28	55	36	3	0	98	8	45.0	15.5
17-Jul	49	0	19	0	39	13	30	5	30	0	141	55	51.3	12.2
6-Aug	79	8	49	3	49	5	30	0	114	0	938	16	209.8	5.3
18-Aug	72	11	72	11	59	3	49	3	22	0	938	13	202.0	6.8
Average	52.0	6.0	54.0	7.5	44.3	12.3	41.0	11.0	42.3	0.0	528.8	23.0	127.0	10.0
Std. Dev.	32.0	4.7	26.2	7.3	12.5	11.4	12.9	16.8	49.2	0.0	472.9	21.6	91.2	4.7

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		
2011 Avg	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
2011 SD	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
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

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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		
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
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 2012

Date	Station											
	1		2		3		4		5		6	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
30-Jun	55	0	22	3	22	3	5	0	22	8	11	0
16-Jul	19	5	36	5	28	13	22	3	13	0	36	3
30-Jul	194	114	132	39	5	0	13	5	19	0	30	5
13-Aug	11	0	22	0	16	0	30	3	16	0	39	0
20-Aug	16	3	25	0	25	3	25	3	52	5	33	0
Average	59.0	24.4	47.4	9.4	19.2	3.8	19.0	2.8	24.4	2.6	29.8	1.6
Std. Dev.	77.4	50.1	47.6	16.7	9.1	5.4	10.0	1.8	15.8	3.7	11.0	2.3

Date	Station										Average All Stations	
	7		8		9		10		11		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
30-Jun	19	3	0	0	25	3	3	0	5	0	17.2	1.8
16-Jul	43	16	5	0	33	3	5	3	33	8	24.8	3.2
30-Jul	8	0	403	200	8	5	30	3	55	8	81.5	34.5
13-Aug	26	5	0	0	8	0	19	5	36	3	20.3	1.5
20-Aug	36	5	0	0	16	0	28	5	46	3	27.5	2.3

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Average	26.4	5.8	81.6	40.0	18.0	2.2	17.0	3.2	35.0	4.4
Std. Dev.	13.8	6.1	179.7	89.4	10.9	2.2	12.6	2.0	18.9	3.5

34.3	8.7
26.7	14.5

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
2011 Avg	58.0	6.0	127.6	36.2	73.4	4.8	115.6	9.6	69.4	12.4	53.6	8.4
2011 SD	38.1	9.2	80.6	75.4	75.2	6.6	94.8	12.6	39.9	19.3	45.3	10.1
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

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Year	Station										Average All Stations	
	7		8		9		10		11		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
2011 Avg	81.0	4.2	146.8	13.6	56.8	6.4	76.4	4.0	79.2	2.8	85.3	9.9
2011 SD	42.5	4.0	150.9	21.8	35.9	7.8	46.8	4.1	82.3	4.8	48.8	12.3
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
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 2012

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		
23-Jun	39	0	25	0	62	0							42.0	0.0
22-Jul	55	5	106	0	694	0	55	3	43	5	49	0	167.0	2.2
8-Aug	98	0	87	3	119	3	83	3	1174	28	1038	39	433.2	12.7
17-Aug	79	5	132	28	263	19							158.0	17.3
1-Sep	19	0	39	3	132	8	106	13	43	3	123	5	77.0	5.3
Average	58.0	2.0	77.8	6.8	254.0	6.0	81.3	6.3	420.0	12.0	403.3	14.7	300.1	7.4
Std. Dev.	31.4	2.7	45.0	11.9	256.7	8.0	25.5	5.8	653.0	13.9	550.9	21.2	188.2	7.4

Please Note, Different Test Dates For Station 4, 5 & 6 (Bayfield Inlet)

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		
2011 Avg	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
2011 SD	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
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 2012

Date	Station										Average All Stations	
	1		2		3		4		5		TC	EC
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC		
6-Jul	403	3	28	0	339	0	233	0	69	5	214.4	1.6
20-Jul	2424	19	151	19	619	8	1038	3	510	3	948.4	10.4
7-Aug	2424	0	2424	3	938	0	2424	0	1696	0	1981.2	0.6
5-Sep	39	0	52	0	194	0	33	0	83	0	80.2	0.0
Average	1322.5	5.5	663.8	5.5	522.5	2.0	932.0	0.8	589.5	2.0	806.1	3.2
Std. Dev.	1280.6	9.1	1174.7	9.1	328.4	4.0	1085.4	1.5	765.5	2.4	871.4	4.9

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	TC		
2011 Avg	703.4	1.6	294.8	3.8	383.2	2.8	589.6	4.2	360.2	5.0	466.2	3.5
2011 SD	701.2	2.3	332.5	2.9	565.6	3.3	534.8	5.4	305.7	6.3	373.7	1.7
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

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Year	Station										Average All Stations	
	1		2		3		4		5		TC	EC
	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 2012

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	TC	EC
1-Jul	25	4	59	16	11	0	28	3	19	8	39	3	30	6
21-Jul	76	30	240	52	110	43	156	55	119	39	132	52	139	45
6-Aug	151	30	110	25	146	27	94	11	206	22	156	19	144	22
19-Aug	72	8	90	13	62	5	69	17	151	13	166	43	102	17
3-Sep	141	0	33	3	30	3	19	0	76	7	28	3	55	3
26-Sep	2424	8	587	5	177	5	28	3	11	0	28	3	543	4
Average	482	13	187	19	89	14	66	15	97	15	92	21	169	16
Std. Dev.	953	13	209	18	66	17	53	21	76	14	67	22	189	16

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		
2011 Avg	53	5	49	12	49	9	74	17	54	6	100	7	63	9
2011 SD	51	4	20	1	14	4	66	16	31	4	63	3	30	4
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 2012

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		
27-Jul	94	13	136	0	90	3	141	3	83	3	418	5	141	0	157.6	3.9
10-Aug	87	8	151	0	90	3	72	3	98	3	280	5	132	0	130.0	3.1
8-Sep	119	0	87	3	62	3	46	0	90	5	263	5	65	3	104.6	2.7
Average	100.0	7.0	124.7	1.0	80.7	3.0	86.3	2.0	90.3	3.7	320.3	5.0	112.7	1.0	130.7	3.2
Std. Dev.	13.7	5.4	33.5	1.7	16.2	0.0	49.1	1.7	7.5	1.2	85.0	0.0	41.5	1.7	26.5	0.6

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		
2011 Avg	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
2011 SD	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
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

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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	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
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. coli
 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 2012

Date	Station																Average All Stations	
	1		2		3		4		5		6		7		8		TC	EC
	TC	EC																
30-Jul	62	5	72	5	30	0	39	0	106	11	83	0	33	3	43	3	58.5	3.4
28-Aug	39	3	22	5	62	0	59	0	33	0	55	0	52	0	76	0	49.8	1.0
Average	50.5	4.0	47.0	5.0	46.0	0.0	49.0	0.0	69.5	5.5	69.0	0.0	42.5	1.5	59.5	1.5	54.1	2.2
Std. Dev.	16.3	1.4	35.4	0.0	22.6	0.0	14.1	0.0	51.6	7.8	19.8	0.0	13.4	2.1	23.3	2.1	6.2	1.7

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	EC	TC	TC	EC	EC	TC	EC	TC	EC	TC	EC		
2011 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
2011 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
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

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Year	Station																Average All Stations	
	1		2		3		4		5		6		7		8		TC	EC
	TC	EC	TC	EC	TC	EC	TC	TC	EC	EC	TC	EC	TC	EC	TC	EC		
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
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 2012

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		
25-Jun	36	3	19	3	25	3	22	0	39	0	28	0	28.2	1.5
9-Jul	22	0	22	0	25	0	79	3	194	3	11	0	58.8	1.0
25-Jul	16	0	30	3	43	0	65	0	110	3	30	0	49.0	1.0
9-Aug	39	3	90	5	102	5	65	0	188	16	39	0	87.2	4.8
29-Aug	49	3	39	3	65	0	79	3	114	13	83	3	71.5	4.2

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Average	32.4	1.8	40.0	2.8	52.0	1.6	62.0	1.2	129.0	7.0	38.2	0.6	58.9	2.5
Std. Dev.	13.3	1.6	29.0	1.8	32.4	2.3	23.4	1.6	64.0	7.0	27.0	1.3	22.4	1.9

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	TC	EC
2011 Avg	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
2011 SD	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
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