



SURFSIDE Water Service Area Annual Report 2009



Prepared by:

REGIONAL DISTRICT OF NANAIMO
Water Services Department

6300 Hammond Bay Rd, Nanaimo, BC Canada V9T 6N2 | Ph 250-390-6560 | Fax 250-390-1542 | Email: dchurko@rdn.bc.ca

Table of Contents

1.	Introduction	1
2.	Surfside Water Service Area	1
2.1	Groundwater Wells	1
2.2	Reservoirs	1
2.3	Distribution System	1
3.	Water Sampling and Testing Program	2
4.	Water Quality - Source Water and Distribution System	2
5.	Water Quality Inquiries and Complaints	2
6.	Groundwater Production and Consumption	3
7.	Maintenance Program.....	3
8.	Water Service Area Projects.....	3
8.1	2009 Completed Studies & Projects.....	3
8.2	2010 Proposed Projects & Upgrades.....	4
9.	Emergency Response Plan	4
10.	Cross Connection Control	4
11.	Closing.....	4

Appendix A - Map of Surfside Water Service Area

Appendix B - Water Quality Testing Results

Appendix C - Emergency Response Plan

1. Introduction

The following annual report describes the Surfside Water Service Area and summarizes the water quality and production data from 2009. This report also includes a summary of inquiries and complaints, completed and proposed maintenance activities, the Emergency Response Plan, and the Cross Connection Control Program.

This report is to be submitted to the Vancouver Island Health Authority by the Spring of 2010.

2. Surfside Water Service Area

The Surfside Water Service Area was established in 1986 and comprises an area northwest of Qualicum Beach on Surfside Drive and part of McFeely Drive. The water source for the Surfside Water Service Area comes from two groundwater wells located nearby. The water source is not chlorinated and is not stored in a reservoir, but is pumped into the system via two pressure tanks. An emergency back-up chlorination station is present inside the pumphouse, should it be required. A map of the Surfside Water Service Area is provided in Appendix A for reference.

2.1 Groundwater Wells

Two groundwater production wells are present in the well field at 3547 West Island Highway, north of Qualicum Beach, B.C.

Well / Name	Well Depth	Wellhead Protection In Place	Treated/Untreated with Chlorine
#1	9.4 m	Yes	Untreated
#2	9.8 m	Yes	Untreated

2.2 Reservoirs

There is no reservoir in the Surfside Water Service Area. Water supply is pumped into the system via a dual pressure tank arrangement.

2.3 Distribution System

The water distribution system in Surfside is summarized in the table below. Flushouts are present, but there are no fire hydrants on the system.

Watermain Material	Length of mains in San Pareil Water Service Area	Prevalence in Water Service Area
<u>Asbestos-concrete:</u> 150mm or smaller 200mm or larger	0.8 km none	72.5% n/a
<u>PVC:</u> 150mm or smaller 200mm or larger	0.006 km 0.3 km	0.5% 27%

Note: 'PVC' is poly-vinylchloride (plastic)

3. Water Sampling and Testing Program

Water sampling and testing is carried out weekly in the distribution system. The following table includes a summary of all testing:

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.Coli Temperature, pH, Conductivity Chlorine residual, Salinity, TDS
Health Dept. (Monthly or as required)	BC Centre for Disease Control	Total, Fecal coliforms
Monthly	North Island Labs	Iron, Manganese, Chloride
Quarterly	North Island Labs	Sodium, Chloride, Conductivity Total Dissolved Solids
Annual Source Water Testing	North Island Labs	Complete potability testing of each well
Annual System Water Testing	North Island Labs	Complete potability testing of distribution system

4. Water Quality - Source Water and Distribution System

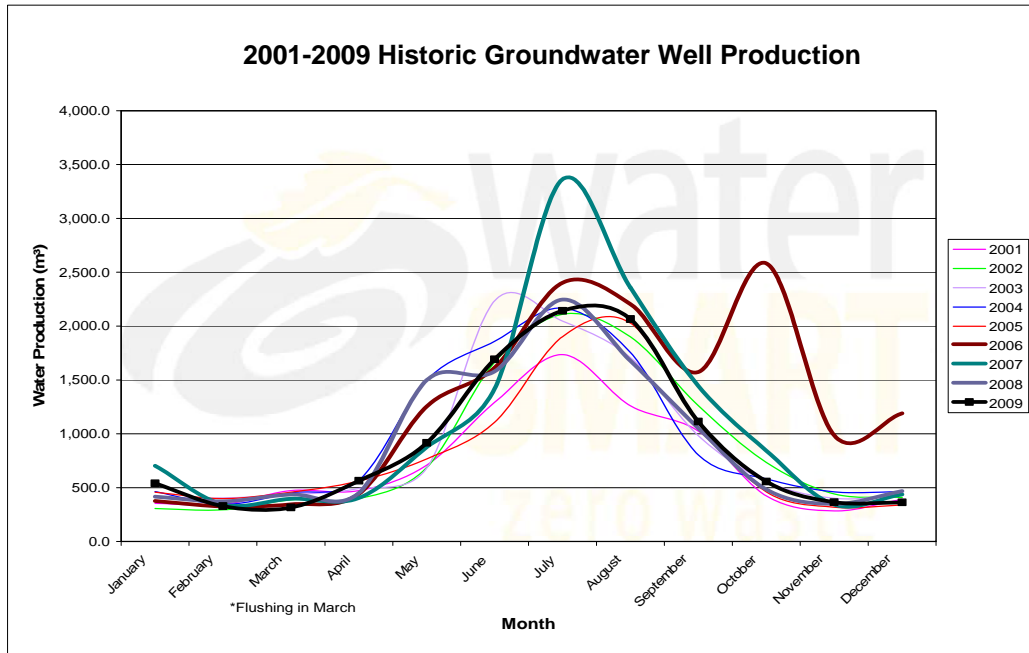
Up-to-date water quality reports and lab data are posted monthly on the RDN website at www.rdn.bc.ca in the WaterSmart section, under “Communities”. Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

5. Water Quality Inquiries and Complaints

Very few complaints and inquiries were received from the Surfside water service area, and were typically related to interruption of supply (power outages).

6. Groundwater Production and Consumption

The monthly groundwater production in the Surfside Water Service Area for the past 9 years is shown in the chart below. There are 38 water service connections in Surfside. Groundwater production in 2009 was average in comparison to previous years.



Consumption

In the Fall/Winter of 2009, the average usage per home in Surfside was 0.42 cubic metres per day (92 imperial gallons). In the summer, the average water usage was 1.52 cubic metres per day (334 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 354 L/day (based on 2.4 people per household). This consumption is 2.7% more than the RDN system average of 345 L/day/capita for 2009.

7. Maintenance Program

A weekly pump station inspection is carried out to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Watermains are flushed once annually in the Spring. There are no fire hydrants in this water service area due to insufficient supply and capacity for fire flows.

Twenty-four hour on-call coverage is in place to respond to water system emergencies and alarms.

8. Water Service Area Projects

8.1 2009 Completed Studies & Projects

- Installed a permanent generator at the Surfside pumphouse;
- Installed new pump in Surfside Well #1;
- Abandoned old water lines near the Surfside well field (old farm);

- Completed keyless door entry installations at the Field Office and pumphouses;
- Carried out a comprehensive water conservation campaign (Team WaterSmart);
- Updated and improved the RDN website at www.rdn.bc.ca;
- Updated the Emergency Response Plan;
- Considered Scada options for implementation;
- Utilized the Auto E-message service to notify member residents of water service disruptions and upcoming maintenance activities;
- Developed a low-flush toilet incentive;
- Maintained a high level of water quality;
- Maintained excellent customer complaint and service request response times;
- Continued quality control through regular testing and monitoring of our water service areas; and
- Completed additional educational programs.

8.2 2010 Proposed Projects & Upgrades

- Complete the Cross-Connection Control bylaws, and establish a procedure for reviewing commercial and industrial properties for water service area risks.

9. **Emergency Response Plan**

The Emergency Response Plan (ERP) was reviewed and updated in 2009. A copy of the ERP is attached in Appendix C.

10. **Cross Connection Control**

A formalized Cross Connection Control Program was initiated in 2007. Cross connection controls in-place include dual check valves at each service connection, fire hydrant use permits, and water supply bylaws noting discontinued service if a threat to the water supply is perceived by staff.

In 2009, a review and comparison of successful cross-connection control programs in other small Water Service Areas nearby was undertaken. A database of commercial customers was set-up in order to keep track of the maintenance history of testable backflow prevention assemblies at each site. Three RDN Operations staff achieved Backflow Prevention Tester's certification.

The program in 2010 will include:

- A survey of existing and potential cross-connections,
- An audit of RDN-owned facilities in each water service area,
- The preparation of a draft bylaw to allow enforcement of the Cross Connection Control Program.

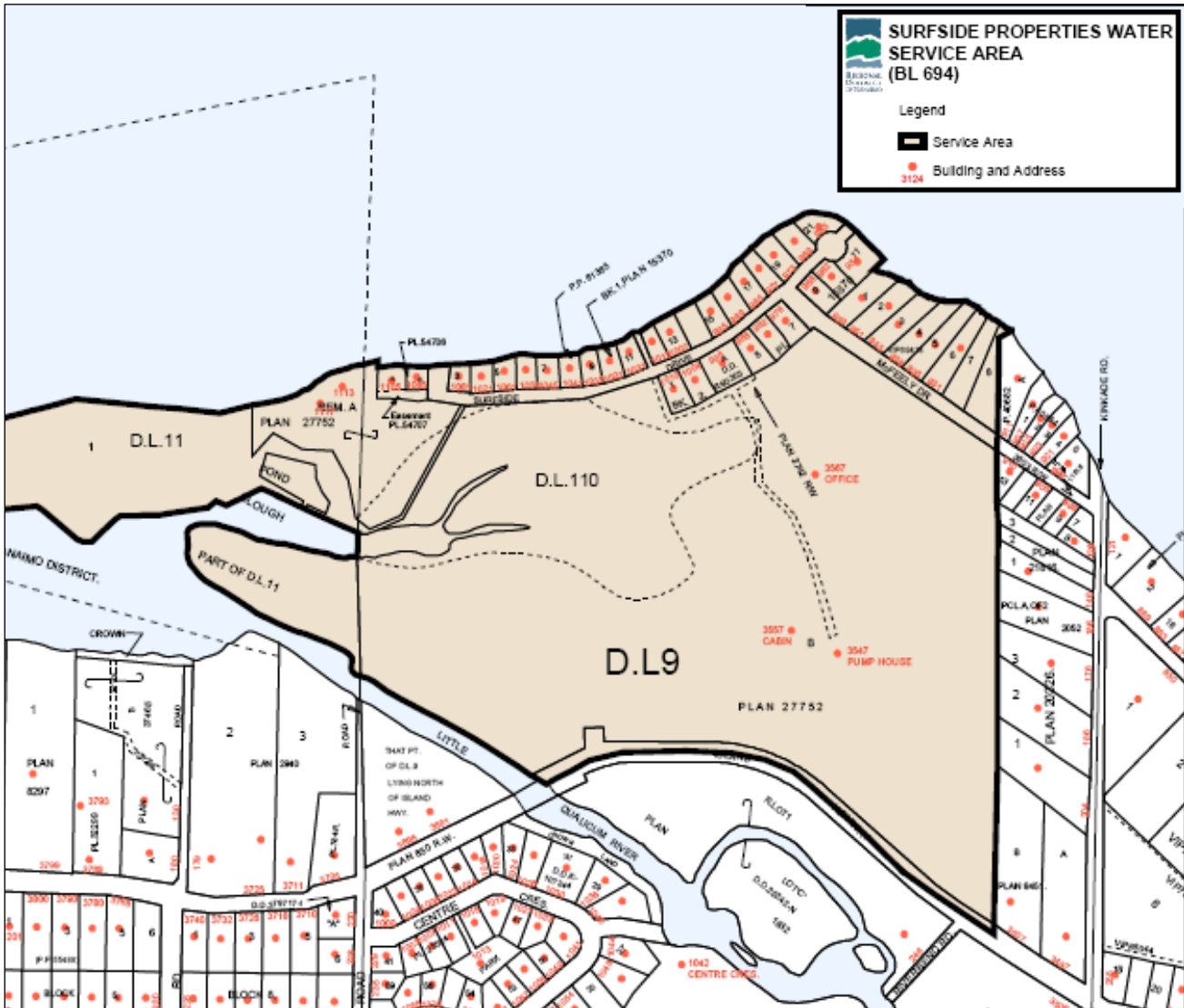
11. **Closing**

An annual report for the year 2010 will be prepared and submitted to the Vancouver Island Health Authority in the Spring of 2011. Annual reports are also available on our website at www.rdn.bc.ca in the WaterSmart section, under "Communities".

APPENIDX A

**MAP OF SURFSIDE
WATER SERVICE AREA**

SURFSIDE WATER SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
06-Jan	1081 Surfside Dr	0	0	0	0	6	6.7	n/a	78	0.1	171	0.01	0.018
13-Jan	962 Surfside Dr	0	0	0	0	5	6.5	n/a	70	0.1	148		
20-Jan	1081 Surfside Dr			0	0	5	6.6	n/a	74	0.1	160.6		
27-Jan	962 Surfside Dr			0	0	5	6.7	n/a	65	0.1	140		
	Average	0	0	0	0	5.3	6.6	#DIV/0!	76.0	0.1	165.8	0.01	0.018
	Maximum	0	0	0	0	6	6.7	0	78	0.1	171	0.01	0.018
	Minimum	0	0	0	0	5	6.5	0	65	0.1	140	0.01	0.018

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
03-Feb	1081 Surfside Dr	0	0	0	0	5	6.8	n/a	74	0.1	162	0.01	0.001
10-Feb	962 Surfside Dr	0	0	0	0	6	6.8	n/a	67	0.1	143		
17-Feb	1081 Surfside Dr			0	0	6	6.9	n/a	75	0.1	157		
24-Feb	962 Surfside Dr			0	0	6	6.6	n/a	69	0.1	147	0.01	0.002
	Average	0	0	0	0	5.8	6.8	#DIV/0!	72.7	0.1	155.3	0.01	0.0015
	Maximum	0	0	0	0	6	6.9	0	75	0.1	162	0.01	0.002
	Minimum	0	0	0	0	5	6.6	0	67	0.1	143	0.01	0.001

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
03-Mar	1081 Surfside Dr			0	0	6	6.6	n/a	69	0.1	147	0.01	0.002
10-Mar	962 Surfside Dr			0	0	6	6.8	n/a	73	0.1	154		
18-Mar	1081 Surfside Dr			0	0	6	6.9	n/a	79	0.1	168		
	Average	#DIV/0!	#DIV/0!	0	0	6.0	6.8	#DIV/0!	73.7	0.1	156.3	0.01	0.002
	Maximum	0	0	0	0	6	6.9	0	79	0.1	168	0.01	0.002
	Minimum	0	0	0	0	6	6.6	0	69	0.1	147	0.01	0.002

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date Apr-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
15-Apr	1081 Surfside Dr	0	0					n/a					
22-Apr	962 Surfside Dr	0	0	0	0	10	6.8	n/a	73	0.1	153		
29-Apr	1081 Surfside Dr					11	6.5	n/a	44	0.1	148		
								n/a					
	Average	0	0	0	0	10.5	6.7	#DIV/0!	58.5	0.1	150.5	#DIV/0!	#DIV/0!
	Maximum	0	0	0	0	11	6.8	0	73	0.1	153	0	0
	Minimum	0	0	0	0	10	6.5	0	44	0.1	148	0	0

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
05-May	962 Surfside Dr	0	0	0	0	12	6.7	n/a	73	0.1	153	0.01	0.007
12-May	1081 Surfside Dr	0	0	0	0	11	6.6	n/a	74	0.1	156		
27-May	962 Surfside Dr			0	0	14	6.4	n/a	71	0.1	148		
	Average	0	0	0	0	12.3	6.6	#DIV/0!	72.7	0.1	152.3	0.01	0.007
	Maximum	0	0	0	0	14	6.7	0	74	0.1	156	0.01	0.007
	Minimum	0	0	0	0	11	6.4	0	71	0.1	148	0.01	0.007

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
02-Jun	962 Surfside Dr	0	0	0	0	17	6.8	n/a	78	0.1	166	0.03	0.008
09-Jun	1081 Surfside Dr	0	0	0	0	15	6.5	n/a	79	0.1	166		
	Average	0	0	0	0	16.0	6.7	#DIV/0!	78.5	0.1	166.0	0.03	0.008
	Maximum	0	0	0	0	17	6.8	0	79	0.1	166	0.03	0.008
	Minimum	0	0	0	0	15	6.5	0	78	0.1	166	0.03	0.008

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
07-Jul	962 Surfside Dr	0	0	0	0	18	6.6	n/a	87	0.1	182	0.01	0.009
15-Jul	1081 Surfside Dr	0	0	0	0	17	6.8	n/a	87	0.1	186		
	Average	0	0	0	0	17.5	6.7	#DIV/0!	87.0	0.1	184.0	0.01	0.009
	Maximum	0	0	0	0	18	6.8	0	87	0.1	186	0.01	0.009
	Minimum	0	0	0	0	17	6.6	0	87	0.1	182	0.01	0.009

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date Aug-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
05-Aug	1081 Surfside Dr	0	0	0	0	19	6.4	n/a	130	0.1	273	0.03	0.001
12-Aug	962 Surfside Dr	0	0	0	0	18	6.4	n/a	139	0.1	292		
19-Aug	1081 Surfside Dr			0	0	19	6.4	n/a	130	0.1	276		
25-Aug	962 Surfside Dr			0	0	17	6.4	n/a	177	0.2	376		
	Average	0	0	0	0	18.3	6.4	#DIV/0!	144.0	0.1	304.3	0.03	0.001
	Maximum	0	0	0	0	19	6.4	0	177	0.2	376	0.03	0.001
	Minimum	0	0	0	0	17	6.4	0	130	0.1	273	0.03	0.001

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
09-Sep	1081 Surfside Dr	0	0			17	6.7	n/a	203	0.2	422	0.01	0.016
16-Sep	962 Surfside	0	0	0	0	20	6.3	n/a	174	0.2	366		
22-Sep	962 Surfside			0	0	19	6.1	n/a	192	0.2	403		
28-Sep	1081 Surfside Dr			0	0	16	6.2	n/a	182	0.2	380		
	Average	0	0	0	0	18.0	6.3	#DIV/0!	187.8	0.2	392.8	0.01	0.016
	Maximum	0	0	0	0	20	6.7	0	203	0.2	422	0.01	0.016
	Minimum	0	0	0	0	16	6.1	0	174	0.2	366	0.01	0.016

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
05-Oct	962 Surfside Dr	0	0	0	0	17	6.8	n/a	171	0.2	353		
14-Oct	1081 Surfside Dr	0	0	0	0	15	6.8	n/a	159	0.2	335		0.019
20-Oct	962 Surfside Dr			0	0		6.8	n/a	182	0.2	383		
28-Oct	1081 Surfside Dr			0	0	13	6.7	n/a	165	0.2	346		
	Average	0	0	0	0	15.0	6.8	#DIV/0!	169.3	0.2	354.3	#DIV/0!	0.019
	Maximum	0	0	0	0	17	6.8	0	182	0.2	383	0	0.019
	Minimum	0	0	0	0	13	6.7	0	159	0.2	335	0	0.019

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date Nov-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
04-Nov	1081 Surfside Dr	0	0	0	0	11	6.4	n/a	120	0	252	0.04	0.018
10-Nov	962 Surfside Dr	0	0	0	0	12	6.6	n/a	148	0.1	312		
17-Nov	1081 Surfside Dr			0	0	9	6.8	n/a	117	0.1	253		
24-Nov	962 Surfside Dr			0	0	8	6.4	n/a	93	0.1	201		
	Average	0	0	0	0	10.0	6.6	#DIV/0!	119.5	0.1	254.5	0.04	0.018
	Maximum	0	0	0	0	12	6.8	0	148	0.1	312	0.04	0.018
	Minimum	0	0	0	0	8	6.4	0	93	0	201	0.04	0.018

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.



Regional District of Nanaimo - Utilities Department

Surfside Water Analysis - Monthly Report



Date Dec-09	Sample Location (Address)	Fecal Coli * Health Dep	Total Coli * Health Dep	Total Coli RDN	E Coli RDN	Temp ° C	pH	Cl ₂ ppm	TDS ppm	Sal %	Cond uS/cm	Fe ppm	Mn ppm
02-Dec	1081 Surfside Dr	0	0	0	0	9	6.7	n/a	98	0.1	206	0	0.007
08-Dec	962 Surfside Dr	0	0	0	0	8	6.8	n/a	90	0.1	191		
21-Dec	1081 Surfside Dr			0	0	6	6.3	n/a	90	0.1	196.2		
29-Dec	962 Surfside Dr			0	0	6	6.9	n/a	81	0.1	173.9		
	Average	0	0	0	0	7.3	6.7	#DIV/0!	89.8	0.1	191.8	0.00	0.007
	Maximum	0	0	0	0	9	6.9	0	98	0.1	206	0	0.007
	Minimum	0	0	0	0	6	6.3	0	81	0.1	173.9	0	0.007

Red font indicates non-compliance with Canadian Drinking Water Guidelines / BC Approved Water Quality Guidelines

Coliforms are measured in colony forming units (CFU) per 100 millilitres of water

* Yellow Column Coliform tests are done by Health Department

Green tests are completed by RDN

Comments:

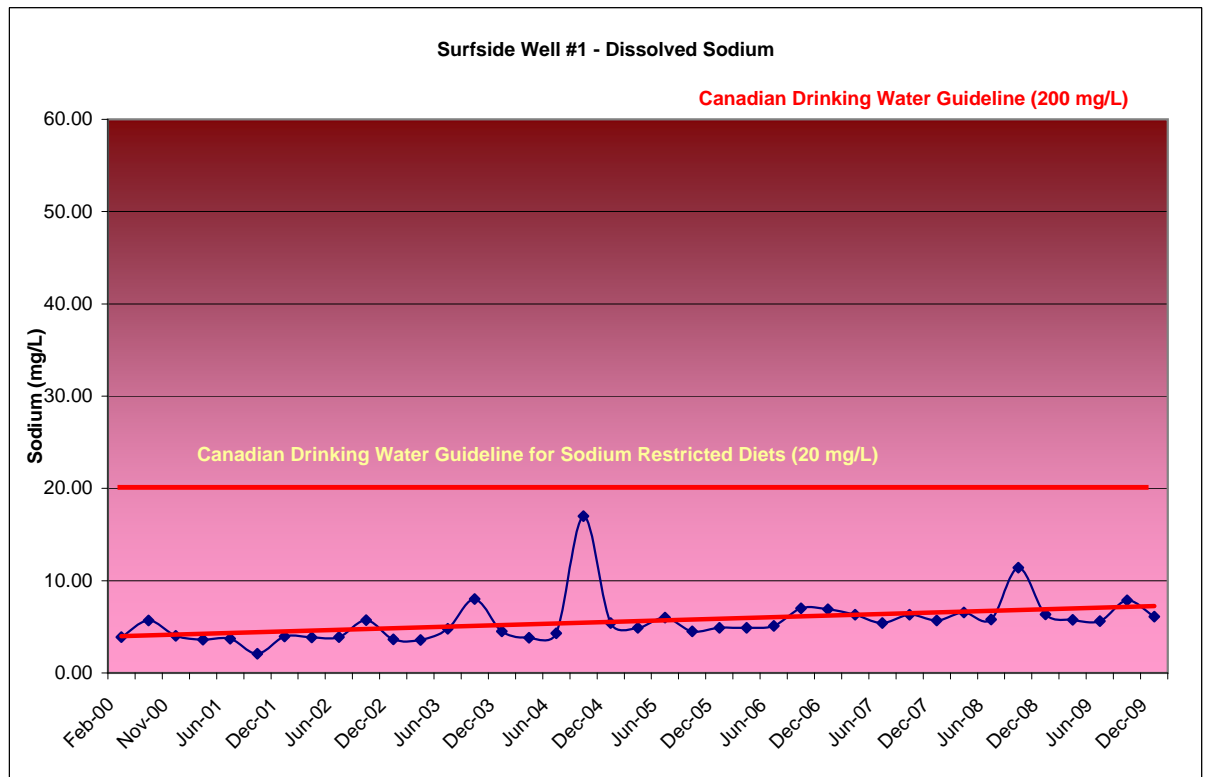
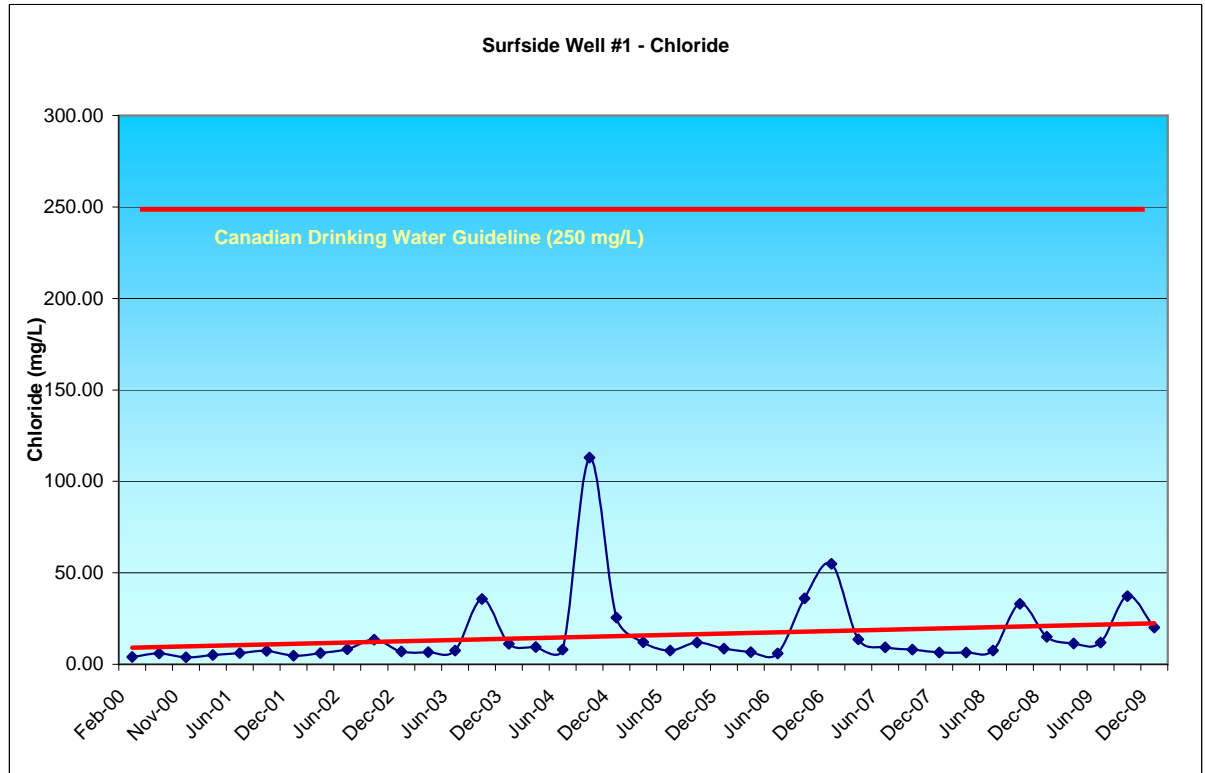
Iron and manganese are found naturally in drinking water. Levels found in these samples are not a health concern.

Lab Analysis - Surfside Well #1

Quarterly Chloride - Sodium Comparison

Chloride - CDWG = 250 mg/L
Diss. Sodium - CDWG = 200 mg/L

Date	Chloride (mg/L)	Sodium (mg/L)
Jun-99	5.30	5.00
Oct-99	pump out of commission	
Feb-00	4.10	3.90
Jun-00	5.90	5.70
Nov-00	3.81	4.04
Mar-01	5.13	3.61
Jun-01	6.16	3.71
Sep-01	7.33	2.09
Dec-01	4.76	3.97
Mar-02	6.16	3.86
Jun-02	8.23	3.90
Sep-02	13.55	5.72
Dec-02	6.96	3.65
Mar-03	6.59	3.58
Jun-03	7.50	4.80
Sep-03	35.70	8.00
Dec-03	11.20	4.50
Mar-04	9.50	3.80
Jun-04	8.10	4.30
Sep-04	113.00	17.00
Dec-04	25.60	5.40
Mar-05	12.00	4.90
Jun-05	7.60	6.00
Sep-05	11.90	4.50
Dec-05	8.50	4.90
Mar-06	6.60	4.90
Jun-06	5.90	5.10
Sep-06	36.00	7.00
Dec-06	55.00	6.90
Mar-07	13.60	6.30
Jun-07	9.30	5.40
Sep-07	8.10	6.30
Dec-07	6.40	5.70
Mar-08	6.50	6.54
Jun-08	7.50	5.80
Sep-08	33.10	11.40
Dec-08	15.1	6.34
Mar-09	11.40	5.77
Jun-09	11.90	5.63
Sep-09	37.30	7.87
Dec-09	20.2	6.12

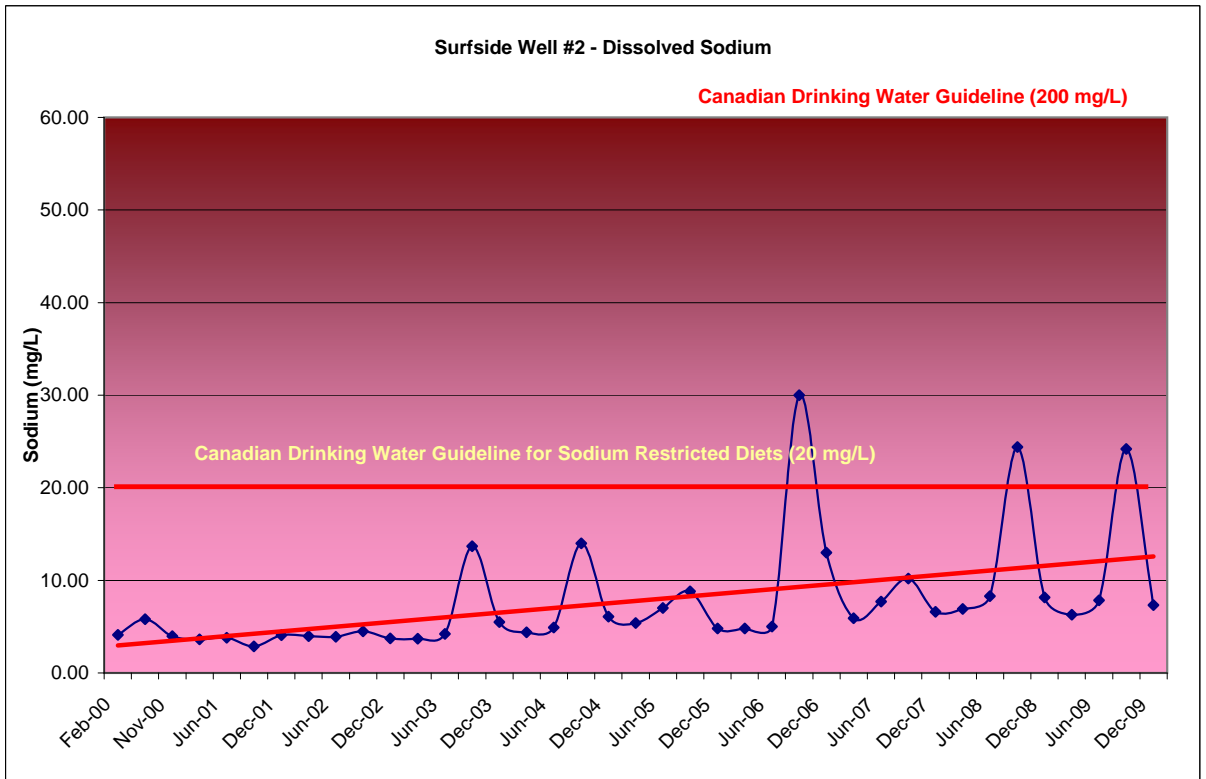
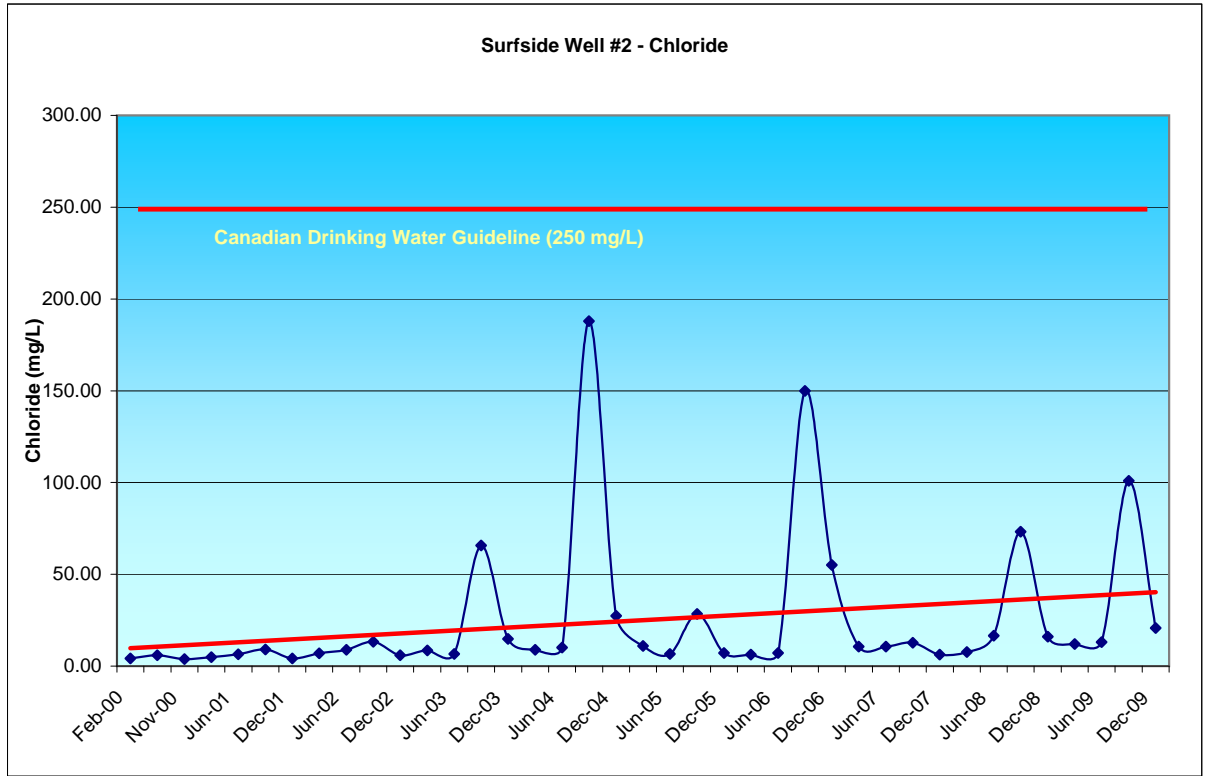


Lab Analysis - Surfside Well #2

Quarterly Chloride - Sodium Comparison

Chloride - CDWG = 250 mg/L
Diss. Sodium - CDWG = 200 mg/L

Date	Chloride (mg/L)	Sodium (mg/L)
Jun-99	5.30	4.10
Oct-99	4.40	4.60
Feb-00	4.20	4.10
Jun-00	6.00	5.80
Nov-00	3.76	3.99
Mar-01	4.88	3.63
Jun-01	6.47	3.81
Sep-01	9.05	2.88
Dec-01	4.24	4.07
Mar-02	6.93	3.96
Jun-02	8.82	3.92
Sep-02	13.30	4.50
Dec-02	6.01	3.73
Mar-03	8.52	3.71
Jun-03	6.70	4.20
Sep-03	65.8	13.7
Dec-03	14.90	5.50
Mar-04	8.90	4.40
Jun-04	10.10	4.90
Sep-04	188.00	14.00
Dec-04	27.30	6.10
Mar-05	11.00	5.40
Jun-05	6.60	7.00
Sep-05	28.50	8.80
Dec-05	7.2	4.8
Mar-06	6.30	4.80
Jun-06	7.10	5.00
Sep-06	150.0	30.0
Dec-06	55.0	13.0
Mar-07	10.7	5.9
Jun-07	10.7	7.7
Sep-07	12.7	10.2
Dec-07	6.3	6.6
Mar-08	7.70	6.91
Jun-08	16.5	8.3
Sep-08	73.2	24.4
Dec-08	16.0	8.16
Mar-09	12.1	6.30
Jun-09	13.1	7.85
Sep-09	101.0	24.2
Dec-09	20.8	7.34

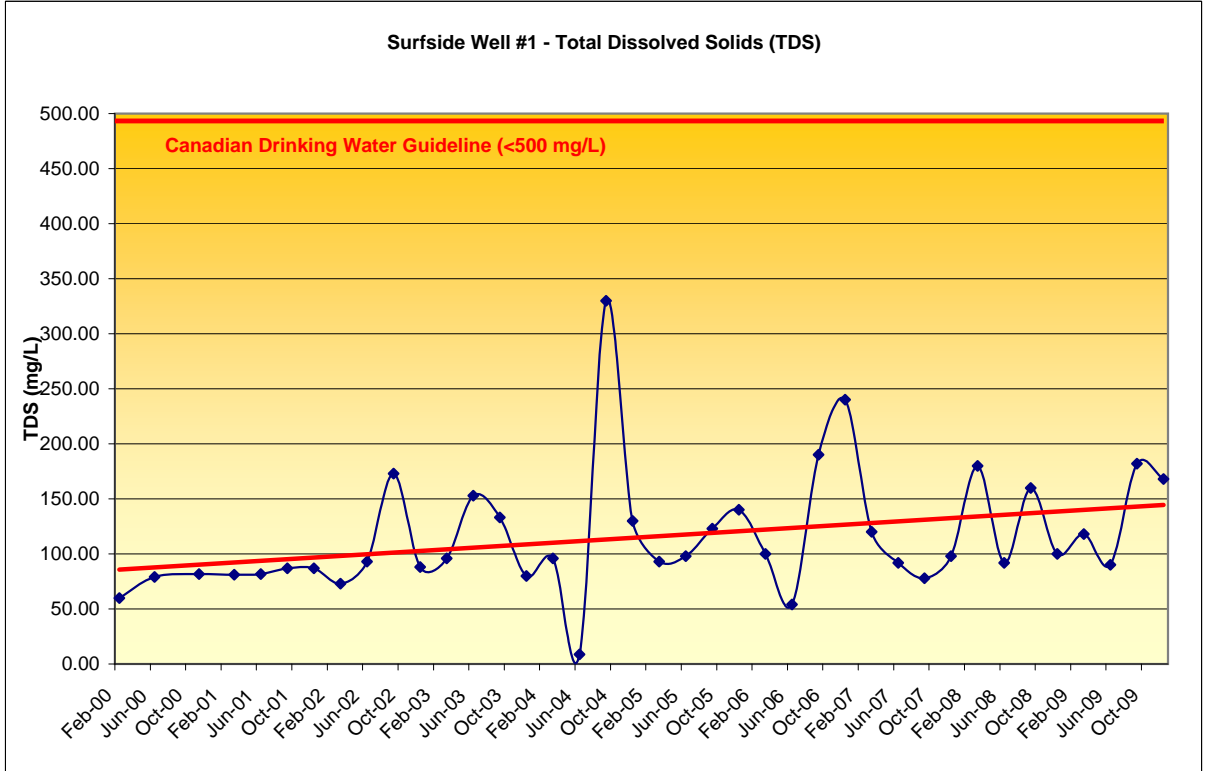
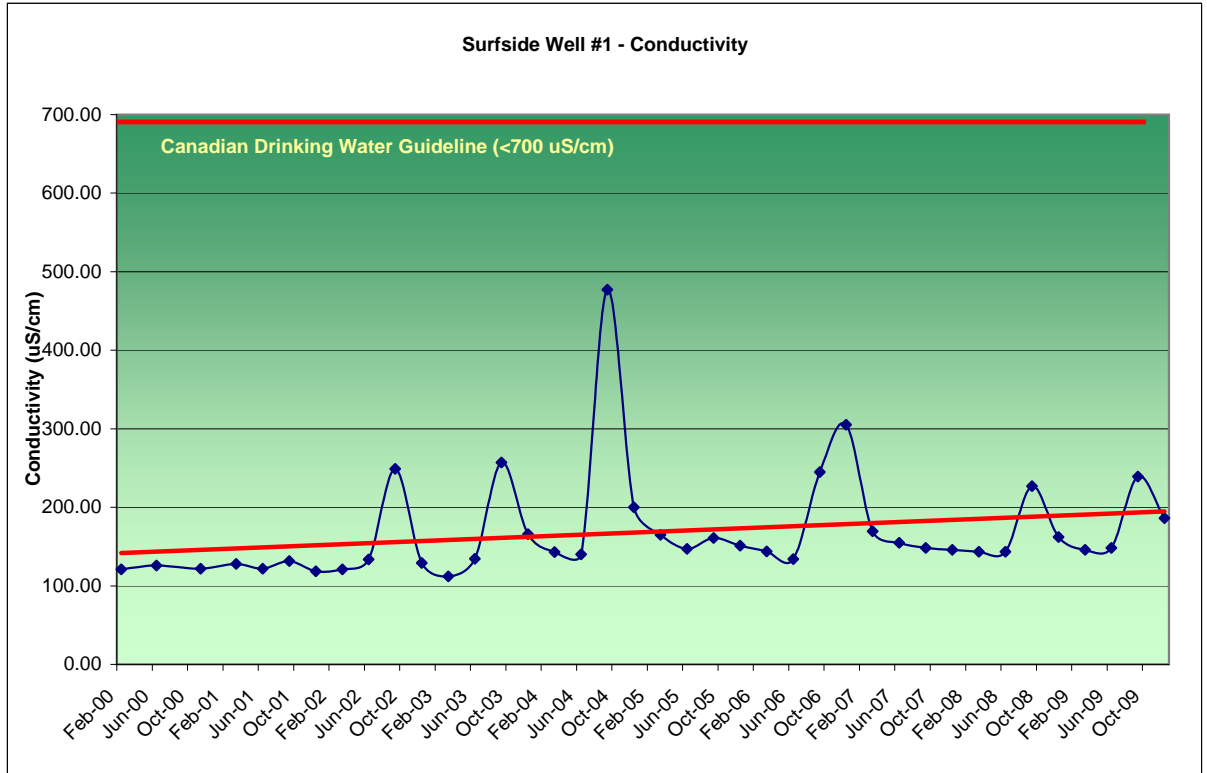


Lab Analysis - Surfside Well #1

Quarterly Conductivity - TDS Comparison

Cond. - CDWG = <700 uS/cm
TDS - CDWG = <500 mg/L

Date	Cond. (µS)	TDS (mg/L)
Jun-99	118.00	91.00
Oct-99	pump out of commission	
Feb-00	121.00	60.00
Jun-00	126.00	79.00
Nov-00	122.00	81.70
Mar-01	128.00	81.00
Jun-01	122.00	81.70
Sep-01	131.60	87.00
Dec-01	118.70	87.00
Mar-02	121.00	73.00
Jun-02	133.50	93.00
Sep-02	249.00	173.00
Dec-02	129.00	88.00
Mar-03	112.00	96.00
Jun-03	134.60	153.00
Sep-03	257.00	133.00
Dec-03	166.00	80.00
Mar-04	143.00	96.00
Jun-04	140.00	8.700
Sep-04	477.00	330.00
Dec-04	200.00	130.00
Mar-05	164.90	93.00
Jun-05	147.00	98.00
Sep-05	160.80	123.00
Dec-05	151.00	140.00
Mar-06	144.00	100.00
Jun-06	134.10	54.00
Sep-06	245.00	190.00
Dec-06	305.00	240.00
Mar-07	169.60	120.00
Jun-07	155.00	92.00
Sep-07	148.30	78.00
Dec-07	146.00	98.00
Mar-08	143.40	180.00
Jun-08	143.40	92.00
Sep-08	227.00	160.00
Dec-08	162.00	100.00
Mar-09	146.00	118.00
Jun-09	148.40	90.00
Sep-09	239.00	182.00
Dec-09	186.1	168

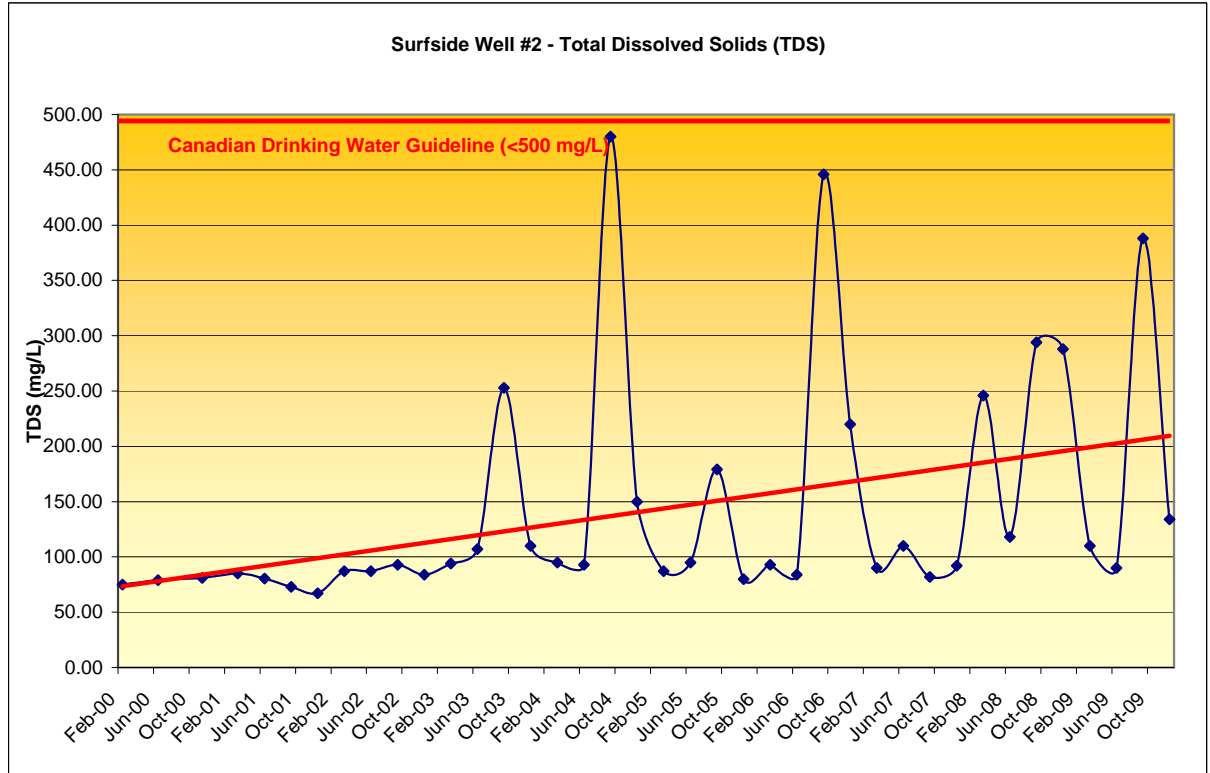
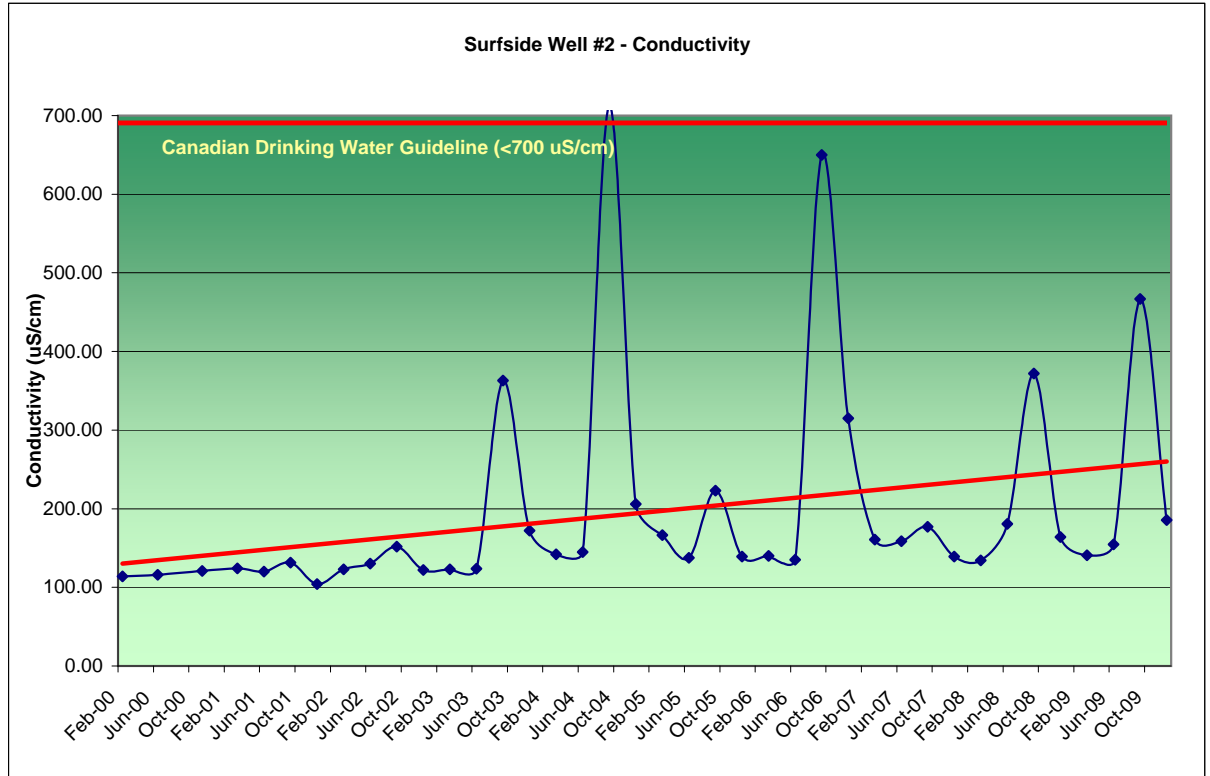


Lab Analysis - Surfside Well #2

Quarterly Conductivity - TDS Comparison

Cond. - CDWG = <700 uS/cm
TDS - CDWG = <500 mg/L

Date	Cond. (µS)	TDS (mg/L)
Jun-99	115.00	91.00
Oct-99	114.00	75.00
Feb-00	114.00	75.00
Jun-00	116.00	79.00
Nov-00	121.00	81.10
Mar-01	124.00	85.00
Jun-01	120.00	80.40
Sep-01	131.60	73.00
Dec-01	104.10	67.00
Mar-02	123.00	87.00
Jun-02	130.20	87.00
Sep-02	152.00	93.00
Dec-02	122.00	84.00
Mar-03	123.00	94.00
Jun-03	123.80	107.00
Sep-03	363.00	253.00
Dec-03	172.00	110.00
Mar-04	142.00	95.00
Jun-04	145.00	93.00
Sep-04	713.00	480.00
Dec-04	206.00	150.00
Mar-05	166.50	87.00
Jun-05	137.40	95.00
Sep-05	223.00	179.00
Dec-05	139.20	80.00
Mar-06	139.80	93.00
Jun-06	135.20	84.00
Sep-06	650.00	446.00
Dec-06	315.00	220.00
Mar-07	160.80	90.00
Jun-07	158.60	110.00
Sep-07	177.00	82.00
Dec-07	139.00	92.00
Mar-08	134.10	246.00
Jun-08	180.60	118.00
Sep-08	372.00	294.00
Dec-08	164.00	288.0
Mar-09	141.00	110.00
Jun-09	154.50	90.00
Sep-09	467.00	388.00
Dec-09	185.6	134





Surfside Distribution Water Analysis Results

Location: 1081 Surfside Drive

Canadian Drinking Water Guidelines Package



MAC=Maximum Acceptable Concentration IMAC=Interim Maximum Acceptable Concentration AO=Aesthetic Objective

CDWG=Canadian Drinking Water Guidelines BCAWQG=British Columbia Approved Water Quality Guidelines

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Parameters	Water Quality Guidelines				2000	28-Jun 2001	06-Mar 2002	23-Apr 2003	2004	20-Apr 2005	17-May 2006	22-May 2007	26-May 2008	11-May 2009	2010	2011
	Units	CDWG	BCAWQG													
Color	CU	15	</=15	AO	15	3	2	2	5	<5	<5	8	<5	<5		
Conductivity	uS		700	MAC	291	137	128	175	159	163.1	148.3	163.7	151	157.9		
TDS	mg/L	500	</=500	AO	211	87	53	53	93	53	93	86	104	116		
Hardness (CaCO3)	mg/L	80-100	</=500	AO	88	55.3	55.2	58.4	64	68	58	73	53	67		
pH	pH units	6.5-8.5	6.5-8.5	AO	7.35	6.8	6.39	6.8	6.8	6.7	6.8	6.7	6.96	7		
Turbidity	NTU's	5	1	MAC	1.1	<.05	0.43	0.06	0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
Alkalinity	mg/L				151	47	47	23	53	59	53	53	49	48		
Chloride	mg/L	250	</=250	AO	12.5	7.3	6.41	7.58	7.9	9.3	6.8	10.5	8.5	12.9		
Fluoride	mg/L	1.5	1.5	MAC	0.12	<.04	0.07	<0.01	<1	<1.0	<0.1	<1.0	<1.0	<1.0		
Sulfate	mg/L	500	</=500	AO	0.5	3.97	4.08	4.86	17.4	6.4	7.3	8.1	6.1	4.8		
Nitrate	mg/L	10	10	MAC	0.33	0.459	0.46	0.52	0.6	0.6	0.54	0.4	0.6	0.8		
Nitrite	mg/L	1			0.068	<.002	<.006	<0.01	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1		
T-Aluminum	mg/L		0.2	MAC		0.031	<.009	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005		
T-Antimony	mg/L		0.006	MAC		<.006	<.006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.001	<0.0002		
T-Arsenic	mg/L	0.025	0.025	IMAC	0.001	<.01	<.01	<0.0002	<0.0002	0.0002	<0.0002	<0.0004	<0.001	<0.0002		
T-Barium	mg/L	1.0	1	MAC	0.005	0.0448	0.0004	0.002	0.002	0.002	0.002	<0.002	<0.005	0.002		
T-Boron	mg/L	5.0	5	MAC	0.1	0.021	0.02	0.022	0.02	0.022	0.016	0.022	<0.02	0.049		
T-Cadmium	mg/L	0.005				<.0006	<.0006	<0.00001	<0.00001	<0.00001	<0.00001	<0.00002	<0.0003	<0.00001		
T-Calcium	mg/L					18	16.7	18.8	21	21.7	18.9	23.5	17.1	21.5		
T-Chromium	mg/L	0.05	0.05	MAC		<.0009	<.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.003	<0.0004		
T-Copper	mg/L	1.0	</=1	MAC		0.016	0.014	0.013	0.014	0.013	0.011	0.01	0.02	0.017		
T-Iron	mg/L	0.3	</=0.3	AO	0.17	0.031	0.109	<0.1	<0.1	<0.1	<0.1	<0.2	0.06	<0.1		
T-Lead	mg/L	0.01	0.01	MAC		<.002	0.003	0.0003	0.0002	0.0003	0.0002	0.0004	<0.0005	0.0003		
T-Lithium	mg/L													<0.001		
T-Magnesium	mg/L		</=700	AO	9.24	2.53	3.29	2.8	3	3.4	2.7	3.4	2.6	3.24		
T-Manganese	mg/L	0.05	</=0.05	AO	0.11	0.0006	0.0018	<0.005	<0.005	<0.005	<0.005	<0.005	0.002	0.0005		
T-Mercury	mg/L	0.001	0.001	MAC		<.0001	<.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.02	<0.01	<0.01		
T-Nickel	mg/L													<0.001		
T-Phosphorus	mg/L													<0.01		
T-Potassium	mg/L					<.4	<.4	<0.4	<0.4	<0.4	<0.4	<0.8	0.3	0.4		
T-Selenium	mg/L	0.01	0.01	MAC		0.007	<.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.003	<0.0006		
T-Silver	mg/L													<0.00001		
T-Sodium	mg/L	200	</=200	AO		3.6	4.4	4.4	4.5	5.3	5.5	6.6	6.5	6.57		
T-Uranium	mg/L	0.1	0.1	MAC		<.06	<.02	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.002	<0.0004		
T-Zinc	mg/L	5	<5	AO	0.009	0.009	0.0211	0.004	0.003	0.003	0.004	0.027	<0.005	0.007		
Total Coliform	cfu/100ml	<1	<1	cfu/100ml	<1	<1	n/a	n/a	<1	<1	<1	<1	<1.0	<1.0		
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml	<1	<1	n/a	n/a	<1	<1	<1	<1				
E.coli	cfu/100ml	<1	<1	cfu/100ml							<1	<1	<1.0	<1.0		
Tannins & Lignins					n/a	n/a	<.1	n/a	n/a	n/a	n/a	n/a				
Trihalomethanes	mg/l	0.1		MAC	n/a	n/a	n/a	n/a	n/a	n/a	n/a					

Surfside Well Water Analysis Results

Surfside Well # 1: 3547 Island Highway

Canadian Drinking Water Guidelines Package

MAC=Maximum Acceptable Concentration IMAC= Interim Maximum Acceptable Concentration AO= Asthetic Objective
 CDWG=Canadian Drinking Water Guidelines BCAWQG=British Columbia Approved Water Quality Guidelines

Red font indicates non-compliance with Canadian Drinking Water Guidelines

* raw well water



Parameter	Water Quality Guidelines				16-Oct	22-Oct	26-Oct	19-Oct	24-Oct	22-Oct	08-Oct	14-Oct	
	Units	CDWG	BCAWQG		2002	2003	2004	2005	2006	2007	2008	2009	2010
Color	CU	15	<=15	AO	2	<5	<5	<5	<5	5	<5	<5	
Conductivity	µS		700	MAC	150	190.9	309	168.8	381	148.2	198.5	233	
Total Dissolved Solids	mg/L	500	<=500	AO	53	100	170	122	220	96	154	188	
Hardness (CaCO3)	mg/L	80-100	<=500	AO	53.1	77	120	68	130	56	82	93	
pH	pH units	6.5-8.5	6.5-8.5	AO	6.69	6.75	6.7	7.1	6.7	6.83	6.7	7.1	
Turbidity	NTU's	5	1	MAC	<0.05	0.43	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	
Alkalinity	mg/L				46	51	45	50	43	50	50	47	
Chloride	mg/L	250	<=250	AO	7.06	20.9	66.3	14.9	72.4	7.8	30.9	35.1	
Fluoride	mg/L	1.5	1.5	MAC	0.05	<0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Sulfate	mg/L	500	<=500	AO	4.21	7.7	9.2	6.4	10.8	8.3	7.6	5.8	
Nitrate (N)	mg/L	10	10	MAC	0.35	0.5	0.5	0.5	0.4	0.4	0.4	<0.5	
Nitrite (N)	mg/L	1			<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
T-Aluminum	mg/L		0.2	MAC	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	
T-Antimony	mg/L		0.006	MAC	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	
T-Arsenic	mg/L	0.025	0.025	IMAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
T-Barium	mg/L	1.0	1	MAC	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
T-Boron	mg/L	5.0	5	MAC	0.014	0.017	0.021	0.018	0.019	0.018	0.017	0.028	
T-Cadmium	mg/L	0.005			<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
T-Calcium	mg/L				16	23.2	34.7	20.7	39.5	17.1	24.7	28.1	
T-Chromium	mg/L	0.05	0.05	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	
T-Copper	mg/L	1.0	<=1	MAC	0.007	0.006	0.007	0.011	0.004	0.007	0.016	0.003	
T-Iron	mg/L	0.3	<=0.3	AO	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.08	0.01	
T-Lead	mg/L	0.01	0.01	MAC	0.0007	0.0006	0.0004	0.0004	0.0003	0.0003	0.0007	<0.0001	
T-Magnesium	mg/L		<=700	AO	3.2	4.7	6.8	3.9	7.5	3.3	5.01	5.56	
T-Manganese	mg/L	0.05	<=0.05	AO	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0007	<0.0002	
T-Mercury	mg/L	0.001	0.001	MAC	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.01	<0.01	
T-Nickle	mg/L											<.001	
T-Phosphorus	mg/L											<0.01	
T-Potassium	mg/L				<0.4	0.4	0.6	0.5	0.5	<0.4	0.4	0.04	
T-Selenium	mg/L	0.01	0.01	MAC	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0003	<0.0006	<0.0006	
T-Silver	mg/L											<0.00001	
T-Sodium	mg/L	200	<=200	AO	3.8	4.9	8.1	6.3	12.9	5.7	8.35	7.89	
T-Uranium	mg/L	0.1	0.1	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	
T-Zinc	mg/L	5	<5	AO	0.037	0.012	0.012	0.005	0.007	0.004	0.009	0.008	
Total Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	*16	*1	<1	*12.4	<1.0	
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	<1	<1	<1	<1	<1.0	
E.coli	cfu/100ml	<1	<1	cfu/100ml			<1	<1	<1	<1	<1	<1.0	

Note: Total coliforms can be an indicator of adverse water quality if the result in the re-sample is confirmed positive. (United States Environmental Protection Agency (EPA), 2008) RDN Water samples are always tested for Fecal coliform bacteria at the same time as Total coliforms to rule out the presence of harmful pathogens.

*Resampled and had <1 for all Coliforms

Surfside Well Water Analysis Results

Surfside Well # 2: 3547 Island Highway

Canadian Drinking Water Guidelines Package

MAC=Maximum Acceptable Concentration IMAC= Interim Maximum Acceptable Concentration AO= Asthetic Objective
 CDWG=Canadian Drinking Water Guidelines BCAWQG=British Columbia Approved Water Quality Guidelines

Red font indicates non-compliance with Canadian Drinking Water Guidelines

* raw well water



Parameter	Water Quality Guidelines				16-Oct	22-Oct	26-Oct	19-Oct	24-Oct	22-Oct	08-Oct	14-Oct	
	Units	CDWG	BCAWQG		2002	2003	2004	2005	2006	2007	2008	2009	2010
Color	CU	15	<=15	AO	1	<5	70	5	<5	10	<5	<5	
Conductivity	µS		700	MAC	144	238	312	192.5	600	147.4	301	431	
Total Dissolved Solids	mg/L	500	<=500	AO	60	120	140	88	340	98	226	368	
Hardness (CaCO3)	mg/L	80-100	<=500	AO	55.7	81	99	69	180	51	100	140	
pH	pH units	6.5-8.5	6.5-8.5	AO	6.67	6.55	6.6	7	6.7	6.75	6.6	6.8	
Turbidity	NTU's	5	1	MAC	<0.05	21.1	8.9	5	5.7	<0.5	<0.5	<0.5	
Alkalinity	mg/L				48	46	45	47	40	49	44	43	
Chloride	mg/L	250	<=250	AO	9.3	32.1	61	21.6	120	7.7	61.7	90.4	
Fluoride	mg/L	1.5	1.5	MAC	0.05	<0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	
Sulfate	mg/L	500	<=500	AO	5.03	10.6	9.5	8.1	17.3	8.9	11.5	9.9	
Nitrate (N)	mg/L	10	10	MAC	0.34	0.4	0.4	0.4	0.3	0.4	0.4	0.4	
Nitrite (N)	mg/L	1			<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
T-Aluminum	mg/L		0.2	MAC	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.005	<0.005	
T-Antimony	mg/L		0.006	MAC	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	
T-Arsenic	mg/L	0.025	0.025	IMAC	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	
T-Barium	mg/L	1.0	1	MAC	<0.001	<0.001	0.001	<0.001	0.002	<0.001	0.001	<0.001	
T-Boron	mg/L	5.0	5	MAC	0.013	0.017	0.02	0.019	0.024	0.016	0.019	0.024	
T-Cadmium	mg/L	0.005			<0.00001	0.0001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00007	<0.00001	
T-Calcium	mg/L				16.7	24.4	30.4	21.5	55.8	15.7	31.7	43.6	
T-Chromium	mg/L	0.05	0.05	MAC	<0.0005	<0.0005	0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	
T-Copper	mg/L	1.0	<=1	MAC	0.008	0.009	0.017	0.004	0.003	0.005	0.01	0.003	
T-Iron	mg/L	0.3	<=0.3	AO	<0.1	2.9	2.2	0.5	0.4	<0.1	0.06	0.014	
T-Lead	mg/L	0.01	0.01	MAC	0.0007	0.0014	0.0027	0.0005	0.0002	0.0002	0.0005	0.0002	
T-Magnesium	mg/L		<=700	AO	3.4	4.9	5.7	3.8	10.6	2.9	6.12	8.68	
T-Manganese	mg/L	0.05	<=0.05	AO	<0.005	0.013	0.026	0.006	0.008	<0.005	0.0013	0.0011	
T-Mercury	mg/L	0.001	0.001	MAC	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.01	<0.01	
T-Nickle	mg/l											0.001	
T-Phosphorus	mg/l											0.013	
T-Potassium	mg/L				<0.4	0.4	0.5	0.4	0.8	<0.4	0.5	0.7	
T-Selenium	mg/L	0.01	0.01	MAC	<0.0002	<0.0002	0.0003	0.0004	<0.0002	0.0005	<0.0006	<0.0006	
T-Silver	mg/L											<0.00001	
T-Sodium	mg/L	200	<=200	AO	4.2	8.2	10.4	9.4	32.6	7.6	17.7	23.6	
T-Uranium	mg/L	0.1	0.1	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	
T-Zinc	mg/L	5	<5	AO	0.023	0.009	0.019	0.005	0.007	0.008	0.01	0.006	
Total Coliform	cfu/100ml	<1	<1	cfu/100ml			*1	<1	<1	*OG	<1	<1	
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	<1	<1	<1	<1	<1	
E.coli	cfu/100ml	<1	<1	cfu/100ml					<1	<1	<1	<1	

Note: Total coliforms can be an indicator of adverse water quality if the result in the re-sample is confirmed positive. (United States Environmental Protection Agency (EPA), 2008) RDN Water samples are always tested for Fecal coliform bacteria at the same time as Total coliforms to rule out the presence of harmful pathogens.

*Resampled and had <1 for all Coliforms

APPENDIX C

EMERGENCY RESPONSE PLAN

* Emergency Response Plan not included in Public Copy.