



REGIONAL
DISTRICT
OF NANAIMO



ARBUTUS PARK

Water Local Service Area

Annual Report

2008



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1. Introduction

The following annual report describes the Arbutus Park Water Local Service Area and summarizes the water quality and production data from 2008. 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 2009.

2. Arbutus Park Water System

The Arbutus Park Water Service Area was established in 1983 and comprises an area lying north and south of Powder Point Road, near Garry Oak Drive, Anchor Way, and Florence Drive on the Nanoose Peninsula. The water source for the Arbutus Park Water Service Area comes from a series of groundwater wells located nearby. The water source is chlorinated and stored in the Arbutus Park reservoir and in the shared Fairwinds reservoirs. A map of the Arbutus Park Water System is provided in Appendix A for reference.

The Arbutus Park Water System was incorporated into the boundaries of the Nanoose Bay Peninsula Water Service Area in 2005, along with six other small water systems that the RDN operates in Nanoose Bay. The RDN is currently working with the local Vancouver Island Health Authority (VIHA) to combine these seven RDN water systems under one VIHA Operating Permit, to be known as the Nanoose Bay Peninsula Water Service Area (NBPWSA).

2.1 Groundwater Wells

An abandoned groundwater production well is present at the corner of Powder Point Road and Rowland Road in Nanoose Bay, B.C. The well was closed permanently in 2005 due to inclining mineral concentrations, and declining production. Well closure was completed by Drillwell Enterprises Ltd. on July 14, 2005 by filling the entire length of the hole with bentonite clay. A well closure report was forwarded to the Ministry of Environment and the Vancouver Island Health Authority in November 2006.

Well / Name	Well Depth	Wellhead Protection	Treated/Untreated with Chlorine
Arbutus Park #1 (Closed)	86.9 m	n/a	n/a

2.2 Reservoirs

One concrete service reservoir is located at 2976 Link Place, and has a capacity of 568 m³ (125,000 imperial gallons). Groundwater supply to the Arbutus Park Reservoir comes from the Fairwinds wells located nearby.

2.3 Distribution System

The water distribution system in Arbutus Park is comprised of 100mm and 150mm asbestos-concrete watermains, and 150mm, 200mm, and 250mm PVC watermains. Fire hydrants are located throughout the system.

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 Total Dissolved Solids Iron, Manganese
Weekly (Health Dept. Requirement)	North Island Labs	Total, Fecal coliforms
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

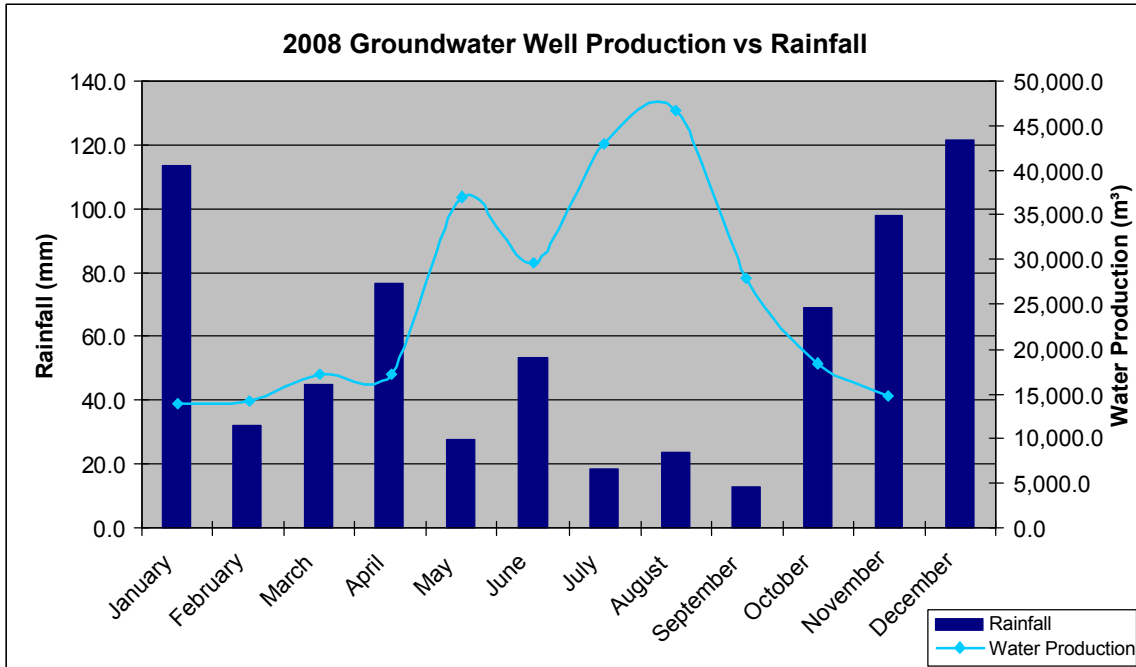
Up-to-date water quality reports and lab data are posted monthly on the RDN website at www.rdn.bc.ca in the WaterSmart section, under “Communities”. Tables of water quality testing results for both the source water and distribution system are provided at the end of this report under Appendix B.

5. Water Quality Inquiries and Complaints

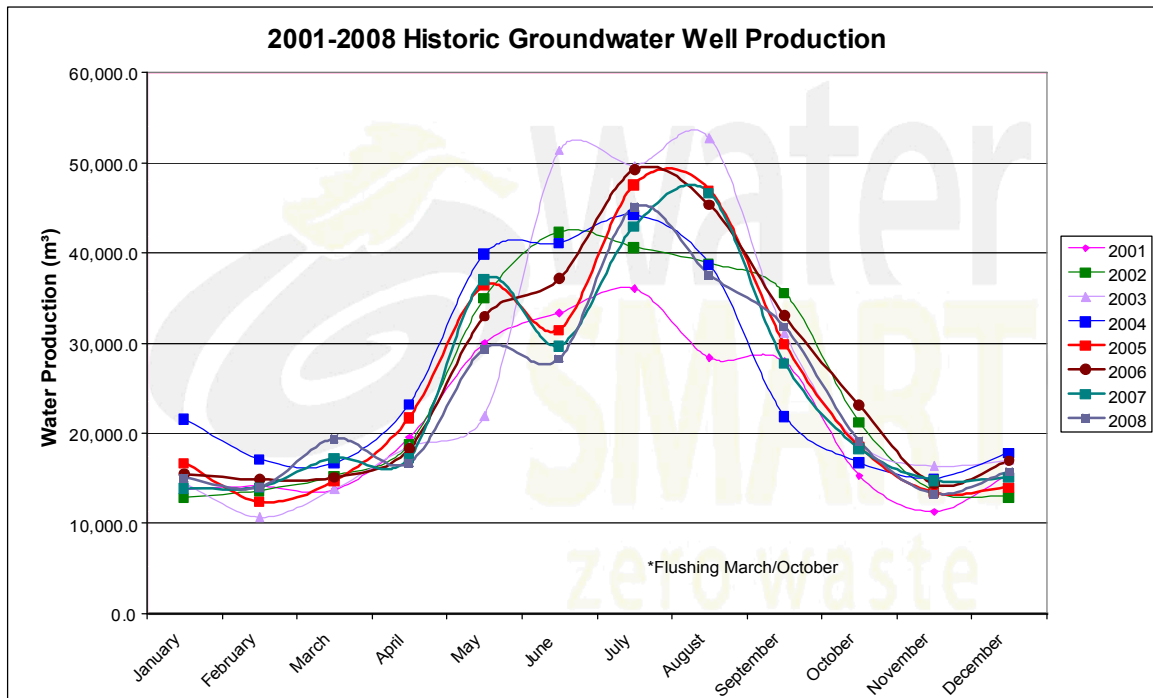
Very few complaints and inquiries were received from the Arbutus Park Water Service Area, and were typically related to objectionable odours in the water.

6. Groundwater Production and Consumption

The 2008 monthly groundwater production for Arbutus Park/Fairwinds is shown in the chart below. The number of Arbutus Park water service connections represents only 131 of 778 total water connections in the surrounding area. Groundwater production has been charted against rainfall data from the City of Parksville website to show the correlation between rainfall and water consumption.



The monthly groundwater production for Arbutus Park and the surrounding area for the past 8 years is shown in the chart below. Groundwater production in 2008 was typically lower than previous years.



Consumption

In the Fall/Winter of 2008, the average usage per home in the Arbutus Park Water Service Area was 0.49 cubic metres per day (108 imperial gallons). In the summer, the average water usage was 1.14 cubic metres per day (251 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 302 L/day. This consumption is 1.2% more than the RDN system average of 298.4 L/day/capita for 2008.

7. Maintenance Program

Regular maintenance and inspections are completed around the reservoir site to reduce or eliminate the risk of contamination and system failure. Watermains are flushed twice annually; in the Spring and Fall.

8. Water System Projects

8.1 2008 Completed Studies & Projects

- Replaced Fairwinds reservoir check valve.
- Upgraded the chlorine dosing pump in the Fairwinds Rechlorination Building.
- Initiated the Water Quality Well Sequencing Program.
- Completed the Nanoose Bay Peninsula Capital Plan.
- Replaced all facility signs.
- Began keyless door entry installation (card lock) at the Water Services field office, and all pumphouse sites.
- Re-keyed all gates and points of entry.
- Established electrical connections for the mobile generator at key sites.
- Completed 'B' fire hydrant maintenance.
- Completed semi-annual watermain flushing.
- Completed a comprehensive water conservation program (**Team WaterSmart**) from May to October.
- Initiated the WaterSmart school program in partnership with Nanaimo Recycling Exchange.
- Updated and improved the RDN **WaterSmart** website.
- Updated the Emergency Response Plan.
- Expanded the Operating Procedures binder.
- Completed the SCADA (Supervisory Control and Data Acquisition) study.
- Completed the Innovative Water Supply and Re-Use study.
- Completed the *Action for Water* referendum process.
- Achieved Backflow Prevention Tester's Certification for 3 Operations staff.
- Renewed the water supply agreement with the City of Parksville.
- Created the Auto E-Message notification sign-up on the RDN website.

8.2 2009 Proposed Projects & Upgrades

- Establish the Drinking Water Protection Advisory Committee.
- Review the SCADA report and options for implementation.
- Purchase well sequencing controllers.
- Complete the keyless door entry installations at all field sites.
- Commence the 2009 **Team WaterSmart** education program.
- Develop a rebate / incentive program.
- Develop the *Well Aware* well safety program.
- Install a stand-alone water sampling station.

8.3 2009 Proposed Studies

- Complete a flow modeling study within Fairwinds reservoir(s).
- Complete the well re-development study

9. **Emergency Response Plan**

The Emergency Response Plan (ERP) was reviewed and updated in 2008. 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 2008, a review and comparison of successful cross-connection control programs in other small water systems 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 2009 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.

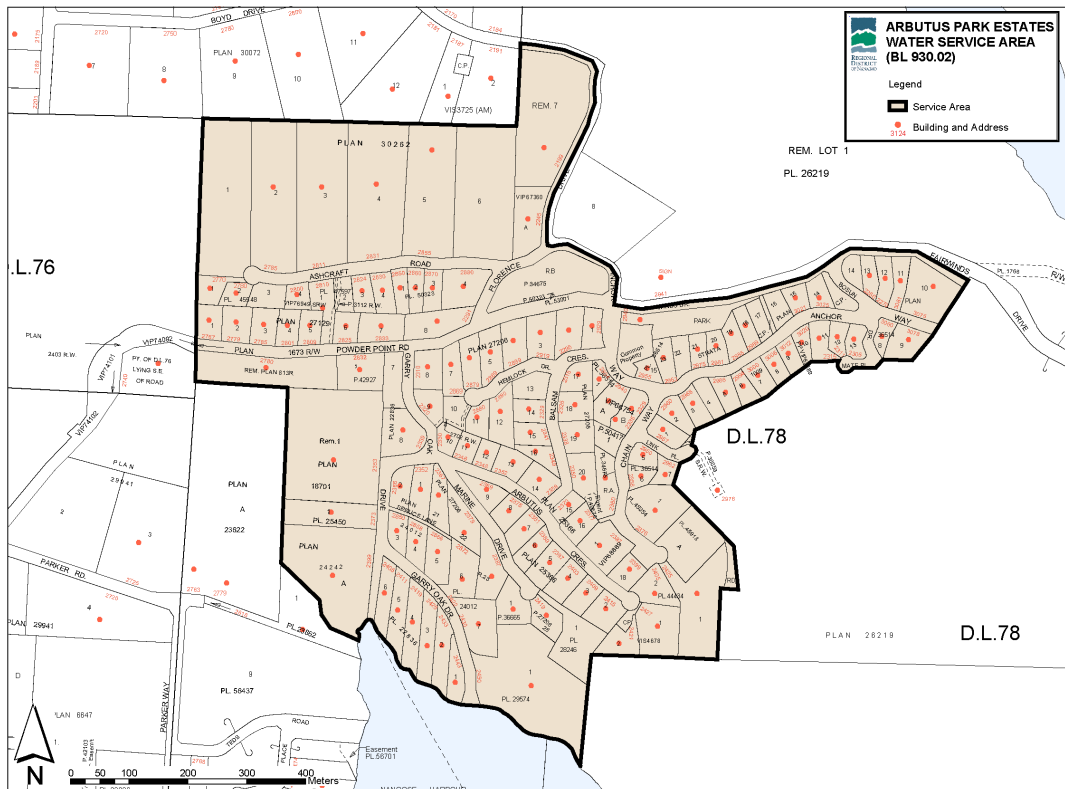
11. **Closing**

An annual report for the year 2009 will be prepared and submitted to the Vancouver Island Health Authority in the Spring of 2010. Annual reports are also available on our website at www.rdn.bc.ca in the WaterSmart section, under "Communities".

APPENIDX A

**MAP OF ARBUTUS PARK
WATER LOCAL SERVICE AREA**

ARBUTUS PARK WATER LOCAL SERVICE AREA



APPENDIX B

WATER QUALITY TESTING RESULTS

Distribution Potability Test Results - Arbutus (Treated Drinking Water)

Date

Test	Water Quality Guidelines				1999	2000	2001	2002	2003	2004	2005	May 17 2006	May 22 2007	May 27 2008
	Units	CDWG	BCAWQG											
Color	CU	15	</=15	AO			23			13	7	37	13	15
Conductivity	uS		700	MAC			351			381	377	379	348	365
TDS	mg/L	500	</=500	AO			187			220	210	220	202	238
Hardness (CaCO3)	mg/L	80-100	</=500	AO			108.3			110	120	110	120	110
pH	pH units	6.5-8.5	6.5-8.5	AO			7.53			7.7	7.6	7.7	7.6	7.8
Turbidity	NTU's	5	1	MAC			0.37			0.8	<0.5	0.9	<0.5	<0.5
Alkalinity	mg/L						137			140	150	150	51	140
Chloride	mg/L	250	</=250	AO			20.5			23.4	2.8	27.9	19.4	22.9
Fluoride	mg/L	1.5	1.5	MAC			0.17			<1.0	<1.0	0.2	<1.0	<1.0
Sulfate	mg/L	500	</=500	AO			1.27			9.4	<2	2.6	2.8	3.3
Nitrate	mg/L	10	10	MAC			0.041			<0.1	<0.1	0.06	<0.1	<0.1
Nitrite	mg/L	1					<0.002			<0.1	<0.1	<0.01	<0.1	<0.1
T-Aluminum	mg/L		0.2	MAC			0.015			<0.005	<0.005	<0.005	<0.005	<0.05
T-Antimony	mg/L		0.006	MAC			0.007			<0.0002	<0.0002	<0.0002	<0.0002	<0.001
T-Arsenic	mg/L	0.025	0.025	IMAC			<0.01			0.0019	0.0021	0.0014	0.001	<0.001
T-Barium	mg/L	1.0	1	MAC			0.0087			0.006	0.006	0.009	0.008	0.005
T-Boron	mg/L	5.0	5	MAC			0.073			0.084	0.07	0.072	0.079	0.06
T-Cadmium	mg/L	0.005					<0.0006			<0.0001	<0.00001	<0.00001	<0.00001	<0.0003
T-Calcium	mg/L						27			27.4	28.5	27.8	29.8	26
T-Chromium	mg/L	0.05	0.05	MAC			<0.0009			<0.0005	<0.0005	<0.0005	<0.0005	<0.003
T-Copper	mg/L	1.0	</=1	MAC			0.003			0.002	<0.001	0.002	0.002	<0.005
T-Iron	mg/L	0.3	</=0.3	AO			0.878			0.4	0.2	0.5	0.6	0.35
T-Lead	mg/L	0.01	0.01	MAC			0.003			0.0003	0.0003	0.0001	0.0001	<0.0005
T-Magnesium	mg/L		</=700	AO			9.93			10.2	10.8	9.7	11	9.7
T-Manganese	mg/L	0.05	</=0.05	AO			0.282			0.184	0.18	0.209	0.257	0.201
T-Mercury	mg/L	0.001	0.001	MAC			<0.0001			<0.0002	<0.0002	<0.0001	<0.0001	<0.01
T-Potassium	mg/L						2.3			2.6	3	2.7	2.6	2.4
T-Selenium	mg/L	0.01	0.01	MAC			0.009			<0.0002	<0.0002	<0.0002	<0.0002	<0.003
T-Sodium	mg/L	200	</=200	AO			29.3			35	35	34.4	31.7	32.4
T-Uranium	mg/L	0.1	0.1	MAC			<0.06			<0.0005	<0.0005	<0.0005	<0.0005	<0.002
T-Zinc	mg/L	5	<5	AO			0.0047			0.008	0.006	0.006	0.01	<0.005
Total Coliform	cfu/100ml	<1	<1	cfu/100ml			<1			<1	<1	<1	<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
Tannins & Lignins										n/a	n/a	n/a	n/a	n/a
Trihalomethanes	mg/l	0.1		MAC						n/a	n/a	0.026	n/a	n/a

BCAWQG - BC approved water quality guidelines

MAC - maximum acceptable concentrations

IMAC - interim maximum acceptable concentrations

AO - aesthetic objective

Red font indicates non-compliance.

Arbutus Well Water Analysis Results

Canadian Drinking Water Guidelines Package

Red font indicates non-compliance with Canadian Drinking Water Guidelines

MAC=Maximum Acceptable Concentration.

IMAC= Interim Maximum Acceptable Concentration.

AO= Aesthetic Objective.

Parameter	Units	CDWG	BCAWQG		2002	2003	2004	2005	2006	2007	2008
Color	CU	15	</=15	AO	18	14	9	off	off	off	off
Conductivity	µS		700	MAC	289	294	290	off	off	off	off
Total Dissolved Solids	mg/L	500	</=500	AO	173	173	170	off	off	off	off
Hardness (CaCO3)	mg/L	80-100	</=500	AO	99.9	105	83	off	off	off	off
pH	pH units	6.5-8.5	6.5-8.5	AO	7.89	7.6	7.7	off	off	off	off
Turbidity	NTU's	5	1	MAC	0.4	0.7	1.2	off	off	off	off
Alkalinity	mg/L				138	150	150	off	off	off	off
Chloride	mg/L	250	</=250	AO	6.3	6.1	7.1	off	off	off	off
Fluoride	mg/L	1.5	1.5	MAC	0.1	<0.6	<1.0	off	off	off	off
Sulfate	mg/L	500	</=500	AO	<0.05	1.7	<2	off	off	off	off
Nitrate (N)	mg/L	10	10	MAC	<0.01	<0.1	<0.1	off	off	off	off
Nitrite (N)	mg/L	1			<0.01	<0.1	<0.1	off	off	off	off
T-Aluminum	mg/L		0.2	MAC	0.008	<0.005	0.009	off	off	off	off
T-Antimony	mg/L		0.006	MAC	0.0002	<0.0002	<0.0002	off	off	off	off
T-Arsenic	mg/L	0.025	0.025	IMAC	0.0004	0.0004	0.0008	off	off	off	off
T-Barium	mg/L	1.0	1	MAC	0.009	0.008	0.009	off	off	off	off
T-Boron	mg/L	5.0	5	MAC	0.043	0.064	0.07	off	off	off	off
T-Cadmium	mg/L	0.005			<0.00001	<0.00001	0.00003	off	off	off	off
T-Calcium	mg/L				26	26.9	21.5	off	off	off	off
T-Chromium	mg/L	0.05	0.05	MAC	<0.0005	<0.0005	<0.0005	off	off	off	off
T-Copper	mg/L	1.0	</=1	MAC	0.004	0.005	0.071	off	off	off	off
T-Iron	mg/L	0.3	</=0.3	AO	0.7	0.6	0.4	off	off	off	off
T-Lead	mg/L	0.01	0.01	MAC	0.0005	0.001	0.0063	off	off	off	off
T-Magnesium	mg/L		</=700	AO	8.5	9.1	7.1	off	off	off	off
T-Manganese	mg/L	0.05	</=0.05	AO	0.153	0.144	0.045	off	off	off	off
T-Mercury	mg/L	0.001	0.001	MAC	<0.0002	0.0003	<0.0002	off	off	off	off
T-Potassium	mg/L				1.9	2.4	1.9	off	off	off	off
T-Selenium	mg/L	0.01	0.01	MAC	<0.0002	<0.0002	<0.0002	off	off	off	off
T-Sodium	mg/L	200	</=200	AO	19.7	20	17.4	off	off	off	off
T-Uranium	mg/L	0.1	0.1	MAC	<0.0005	<0.0005	<0.0005	off	off	off	off
T-Zinc	mg/L	5	<5	AO	0.01	0.008	0.302	off	off	off	off
								off	off	off	off
Total Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	off	off	off	off
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	off	off	off	off
E.coli	cfu/100ml	<1	<1	cfu/100ml				off	off	off	off



Regional District of Nanaimo - Utilities Department

Arbutus 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
08-Jan	2832 Powder Pt	0	0	0	0	8	7.1	0.1	165	0.2	346	0.5	0.237
15-Jan	2940 Fairwinds Dr	0	0	0	0	8	6.9	0.12	165	0.2	349		
22-Jan	2329 Chain Way	0	0			7	7	0.03	169	0.2	364		
	Average	0	0	0	0	7.7	7.0	0.08	166.3	0.2	353.0	0.50	0.237
	Maximum	0	0	0	0	8	7.1	0.12	169	0.2	364	0.5	0.237
	Minimum	0	0	0	0	7	6.9	0.03	165	0.2	346	0.5	0.237

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

Arbutus 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
Feb-08													
05-Feb	2832 Powder Pt	0	0	0	0	8	6.9	0.16	166	0.2	356	0.56	0.238
12-Feb	2940 Fairwinds Dr	0	0	0	0	9	7	0.12	165	0.2	350		
20-Feb	2329 Chain Way	0	0	0	0	7	6.9	0.05	170	0.2	359		
26-Feb	2832 Powder Pt			0	0	8	7.1	0.12	166	0.2	350		
	Average	0	0	0	0	8.0	7.0	0.11	166.8	0.2	353.8	0.56	0.238
	Maximum	0	0	0	0	9	7.1	0.16	170	0.2	359	0.56	0.238
	Minimum	0	0	0	0	7	6.9	0.05	165	0.2	350	0.56	0.238

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Arbutus 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
04-Mar	2940 Fairwinds Dr	0	0	0	0	9	6.9	0.12	165	0.2	348	0.49	0.245
12-Mar	2832 Powder Pt	0	0	0	0	8	7	0.14	164	0.2	345		
18-Mar	2329 Chain Way	0	0	0	0	8	6.9	0.06	167	0.2	353		
26-Mar	2940 Fairwinds Dr					8	7	0.05	165	0.2	352		
Average		0	0	0	0	8.3	7.0	0.09	165.3	0.2	349.5	0.49	0.245
Maximum		0	0	0	0	9	7	0.14	167	0.2	353	0.49	0.245
Minimum		0	0	0	0	8	6.9	0.05	164	0.2	345	0.49	0.245

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Regional District of Nanaimo - Utilities Department

Arbutus Water Analysis - Monthly Report



Date Apr-08	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-Apr	2940 Fairwinds	0	0	0	0	9	6.9	0.05	165	0.2	350	0.2	
08-Apr	2832 Powder Pt	0	0	0	0	10	6.9	0.13	164	0.2	348		
15-Apr	2329 Chain Way	0	0	0	0	9	6.9	0.19	168	0.2	353		0.132
22-Apr	2940 Fairwinds			0	0	10	7	0.14	164	0.2	346		
	Average	0	0	0	0	9.5	6.9	0.13	165.3	0.2	349.3	0.20	0.132
	Maximum	0	0	0	0	10	7	0.19	168	0.2	353	0.2	0.132
	Minimum	0	0	0	0	9	6.9	0.05	164	0.2	346	0.2	0.132

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06-May	2940 Fairwinds Dr	0	0	0	0	11	7	0.2	164	0.2	345	0.56	0.127
21-May	2832 Powder Pt	0	0	0	0	12	6.9	0.13	165	0.2	346		
27-May	2329 Chain Way	0	0	0	0	13	6.9	0.04	163	0.2	341		
	Average	0	0	0	0	12.0	6.9	0.12	164.0	0.2	344.0	0.56	0.127
	Maximum	0	0	0	0	13	7	0.2	165	0.2	346	0.56	0.127
	Minimum	0	0	0	0	11	6.9	0.04	163	0.2	341	0.56	0.127

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04-Jun	2940 Fairwinds Dr	0	0	0	0	12	6.8	0.13	164	0.2	345	0.57	0.247
11-Jun	2832 Powder Pt	0	0	0	0	13	6.8	0.09	121	0.1	254		
17-Jun	2329 Chain Way	0	OG	0	0	13	6.7	0.05	139	0.1	290		
22-Jun	2329 Chain Way	0	0										
24-Jun	2940 Fairwinds Dr	0	0			13	6.8	0.05	132	0.1	278		
	Average	0	0	0	0	12.8	6.8	0.08	139.0	0.1	291.8	0.57	0.247
	Maximum	0	0	0	0	13	6.8	0.13	164	0.2	345	0.57	0.247
	Minimum	0	0	0	0	12	6.7	0.05	121	0.1	254	0.57	0.247

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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

Arbutus Water Analysis - Monthly Report



Date Jul-08	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-Jul	2940 Fairwinds Dr	0	0										
09-Jul	2832 Powder Pt	0	0	0	0	14	6.7	0.18	133	0.1	280	0.42	0.195
15-Jul	2329 Chain Way	0	0	0	0	16	6.7	0.05	133	0.1	280		
22-Jul	2940 Fairwinds Dr			0	0	18	6.7	0.09	134	0.1	281	0.3	0.175
29-Jul	2832 Powder Pt			0	0	14	6.6	0.15	136	0.1	287	0.49	0.203
	Average	0	0	0	0	15.5	6.7	0.12	134.0	0.1	282.0	0.40	0.191
	Maximum	0	0	0	0	18	6.7	0.18	136	0.1	287	0.49	0.203
	Minimum	0	0	0	0	14	6.6	0.05	133	0.1	280	0.3	0.175

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

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Comments:

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Regional District of Nanaimo - Utilities Department

Arbutus Water Analysis - Monthly Report



Date Aug-08	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-Aug	2940 Fairwinds Dr	0	0	0	0	18	6.8	0.11	145	0.1	304	0.28	0.143
12-Aug	2329 Chain Way	0	0	0	0	16	6.7	0.02	137	0.1	288	0.4	0.21
19-Aug	2832 Powder Pt	0	0	0	0	14	6.7	0.1	137	0.1	289		0.2
26-Aug	2329 Chain Way					16	6.6	0.01	134	0.1	282		0.18
	Average	0	0	0	0	16.0	6.7	0.06	138.3	0.1	290.8	0.34	0.1833
	Maximum	0	0	0	0	18	6.8	0.11	145	0.1	304	0.4	0.21
	Minimum	0	0	0	0	14	6.6	0.01	134	0.1	282	0.28	0.143

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Regional District of Nanaimo - Utilities Department

Arbutus 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
Sep-08													
03-Sep	2832 Powder Pt	0	0										
09-Sep	2329 Chain	0	0										
16-Sep	2940 Fairwinds	0	0	0	0	16	6.7	0.05	133	0.1	279	0.28	0.127
	Average	0	0	0	0	16.0	6.7	0.05	133.0	0.1	279.0	0.28	0.127
	Maximum	0	0	0	0	16	6.7	0.05	133	0.1	279	0.28	0.127
	Minimum	0	0	0	0	16	6.7	0.05	133	0.1	279	0.28	0.127

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

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Comments:

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Regional District of Nanaimo - Utilities Department

Arbutus Water Analysis - Monthly Report



Date Oct-08	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-Oct	2832 Powder Pt	0	0	0	0	12	6.8	0.16	132	0.1	278	0.42	0.18
15-Oct	2940 Fairwinds Dr	0	0	0	0	10	6.7	0.05	123	0.1	260		
21-Oct	2329 Chain Way	0	0	0	0	11	7	0.03	130	0.1	275		
29-Oct	2940 Fairwinds Dr			0	0	11	6.8	0.06	117	0.1	248		
	Average	0	0	0	0	11.0	6.8	0.08	125.5	0.1	265.3	0.42	0.18
	Maximum	0	0	0	0	12	7	0.16	132	0.1	278	0.42	0.18
	Minimum	0	0	0	0	10	6.7	0.03	117	0.1	248	0.42	0.18

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

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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

Arbutus 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
04-Nov	2940 Fairwinds Dr	0	0	0	0	11	7	0.06	160	0.2	338	0.54	0.237
12-Nov	2832 Powder Pt	0	0	0	0	13	7	0.09	165	0.2	347		
18-Nov	2329 Chain Way	0	0	0	0	10	6.8	0.06	157	0.2	330		
25-Nov	2940 Fairwinds Dr			0	0	9	6.7	0.12	170	0.2	360		
	Average	0	0	0	0	10.8	6.9	0.08	163.0	0.2	343.8	0.54	0.237
	Maximum	0	0	0	0	13	7	0.12	170	0.2	360	0.54	0.237
	Minimum	0	0	0	0	9	6.7	0.06	157	0.2	330	0.54	0.237

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

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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

Arbutus 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-Dec	2940 Fairwinds Dr	0	0	0	0	10	6.7	0.22	164	0.2	347	0.45	0.187
09-Dec	2832 Powder Pt	0	0	0	0	10	6.8	0.1116	0.2	346			
16-Dec	2329 Chain Way	0	0										
	Average	0	0	0	0	10.0	6.8	0.17	82.1	173.1	347.0	0.45	0.187
	Maximum	0	0	0	0	10	6.8	0.22	164	346	347	0.45	0.187
	Minimum	0	0	0	0	10	6.7	0.1116	0.2	0.2	347	0.45	0.187

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

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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.

APPENDIX C

EMERGENCY RESPONSE PLAN

* Emergency Response Plan not included in Public Copy.