



ALBERNI-CLAYOQUOT
REGIONAL DISTRICT

2011 Annual Water System Report



Introduction

This annual water systems report will provide an overview of the ACRD water services. It is our responsibility to the community and to the provincial health authority to share this information. This report is for the public's review.

The Province of British Columbia's Drinking Water Protection Act and the Drinking Water Regulation prescribes the performance of the water suppliers. Examples of some of these are that the supplier must at all times provide potable water and monitor its sources. The Drinking Water Protection Act Section 15 and the Drinking Water Protection Regulation Section 11 outline the basic requirements that pertain to this annual report.

The Province of British Columbia is responsible for public health and the governance is distributed to local health authorities. The ACRD falls under the Vancouver Island Health Authority (VIHA), whose mission is to minimize health risks to the public. VIHA's Drinking Water program assists with safe drinking water to our communities. This is looked after by VIHA's Public Health Engineer and the Environmental Health Officer who evaluates sources, grants permits and performs inspections.

Management

The Environmental Services Department at the ACRD is responsible for the overall management of the water systems.

In Bamfield there is a committee that works with the ACRD in determining the direction and operation of the water system. The committee is made of the Electoral Area "A" Director, Volunteer Fire Department Fire Chief, Chairman of the Advisory Planning Commission and two members at large.

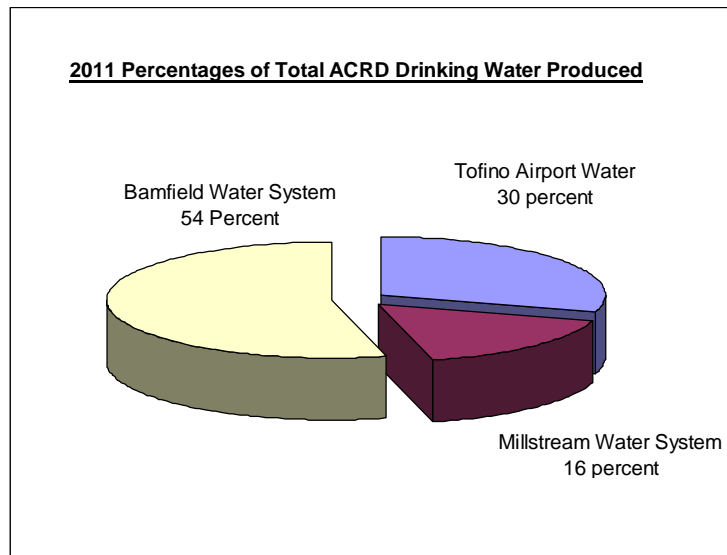
Two contracted water operators run the day to day operations of the Bamfield, Millstream and Tofino Airport Water Systems. They are certified through the Environmental Operator Certificate Program (EOCP) to operate small water systems. All other water systems are monitored by EOCP certified ACRD employees.

Operations

The ACRD regularly performs tests to ensure that the water is meeting all standards. A complete water potability test of the raw water is typically performed every two years. The water system operators regularly check the disinfection and safety of the drinking water and in the systems with chlorine disinfection, the Free Chlorine residual is measured daily. The systems with Ultraviolet Disinfection (UV) are also checked to make sure the light intensity is adequately disinfecting the water.

Monthly water samples are submitted to Vancouver Island Health Authority (VIHA) for monitoring for the purpose of the Drinking Water Protection Act. The water samples are analyzed by the British Columbia Center for Disease Control (BC CDC) for bacteria and specifically Total Coliforms and E. Coli. VIHA's Environmental Health Officer annually checks all permitted drinking water systems

Water mains are regularly flushed and are typically performed during hydrant maintenance. During hydrant maintenance a large quantity of water is discharged creating a higher than normal water velocity that tends to scour the water mains. The scouring removes mineral deposits and sediment that would typically increase chlorine demand.



Total drinking water produced by metered systems

Water Systems Review

The Alberni-Clayoquot Regional District owns and operates seven individually distinct water systems. In order of the highest annual volumes of water produced the water systems names are:

1. Bamfield Community Water System

Bamfield is nestled quietly in a protected inlet on the south shore of Barkley Sound located on the outer west coast of Vancouver Island. Europeans founded a small outpost for fur trading and a fishing community sometime in the late 1800s. Bamfield is divided into two sections, separated by about 200 yards of the Bamfield Inlet. The west side of Bamfield is linked by a waterfront boardwalk that connects all the homes and docks on the harbour side. The east side of Bamfield contains most of the businesses, including a pub, a market and café.

System review:

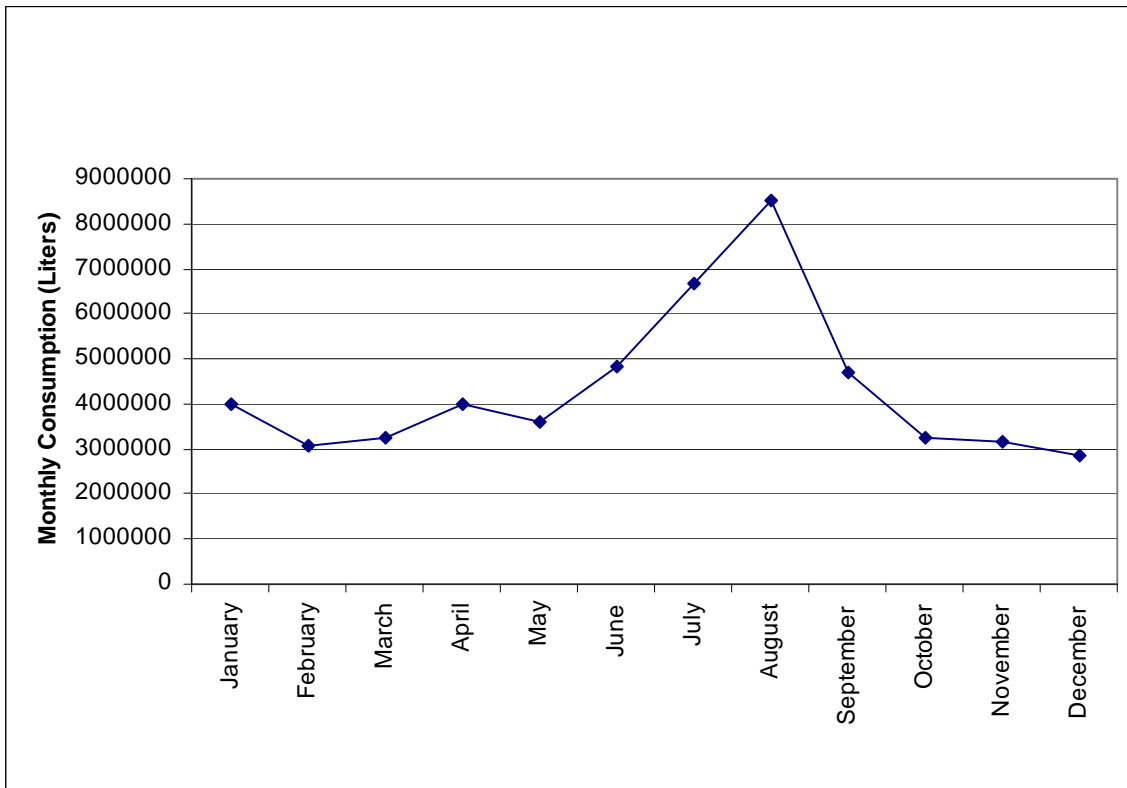
- Water Source: Sugsaw Lake
- Treatment: Fine screen intake
- Disinfection: Chlorine
- Reservoir(s): Two Bolted Steel reservoirs, 47000 & 97000 usg
- Service connections: 207
- Length of mains:
 - Approximately. 4550 meters of 150mm (6 inch)
 - Approximately. 1300 meters of 100mm (4 inch)
 - Approximately. 5175 meters of 50mm (2 inch)
 - Approximately. 325 meters of 25mm (1 inch)
- Water main material: Polyvinyl Chloride (PVC) and Polyethylene (PE)
- Average Daily Flow: 142 cu. meters

The Bamfield Water System was constructed in 1979 and 1980. Before then, water was collected from individual wells, local springs and rain water collection systems. The Bamfield Water System is complex and the largest water system within the ACRD. This complexity is partially due to the various subsurface water lines crossing the inlets in various locations. These marine water lines are challenging to repair, being under water and often under layers of sediment.

The Bamfield water system has experienced distribution leaks caused by dissimilar metals and exposed pipes, which are subject to freezing. During a power outage there is a back up generator which automatically starts providing no disruption to the water supply.

In 2011 the pump house and chlorination building were painted, new roofs were installed and a security fence was erected around the pump house. The Coast Guard site on the west side upgraded their water service to facilitate their school building for the Rigid Hull Inflatable – Operator Training (RHIOT).

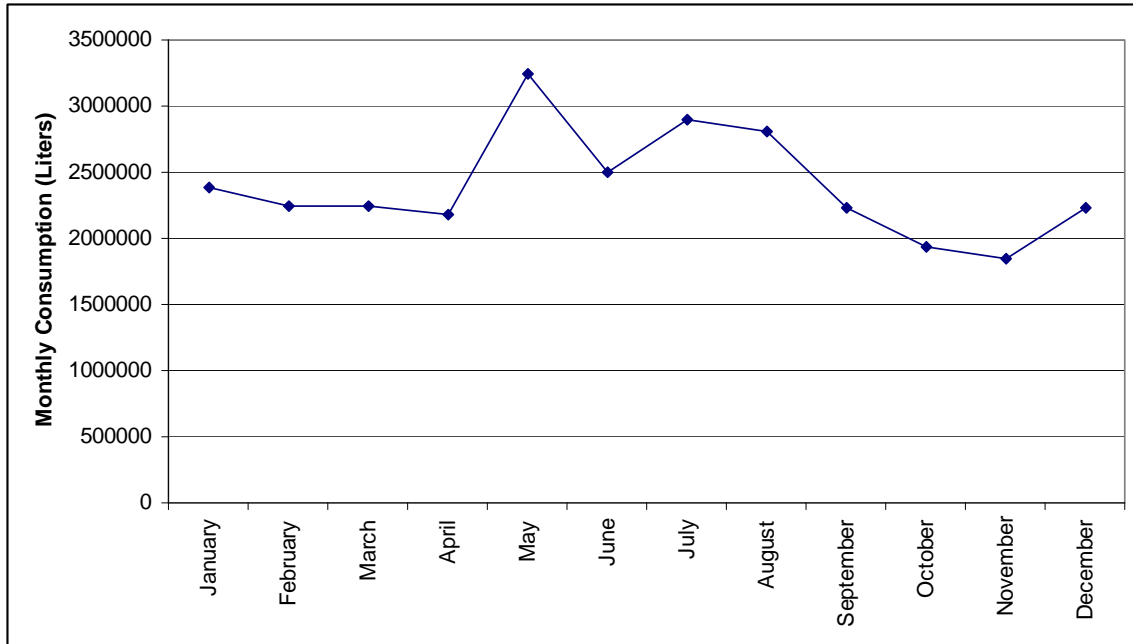
Other slated improvements are rebuilding the floating water intake structure located on Sugsaw Lake and cleaning of the two reservoirs. Also there is a plan to review replacing sections of pipe that have dissimilar metals throughout the distribution network. The Bamfield Water System has a new operator who runs the day to day operation of the system. He also will be involved with working on these improvements.



Bamfield Water Systems 2011 Monthly Consumption

2. Tofino Airport Water System

The Tofino Airport Water System is located within the Long Beach Airport across from Long Beach of the Pacific Rim National Park. The airport is located between the villages of Tofino and Ucluelet, on the west coast of Vancouver Island. The Tofino Airport Water System was originally constructed during World War II to service the military airport and related services. Currently, the supply and treatment system is



Tofino Airport Water Systems 2011 Monthly Consumption

3. Millstream Community Water System

Millstream is a small residential community located approximately 3.5 km north of the District of Ucluelet. The area was originally developed by a logging contractor to provide accommodation for employees and their families. The existing water system was constructed between July and October in 1969. The type of pipe used was asbestos cement (A.C.), which was the current technology at the time. The original wood reservoir was replaced with a metal reservoir in the early 1990's.

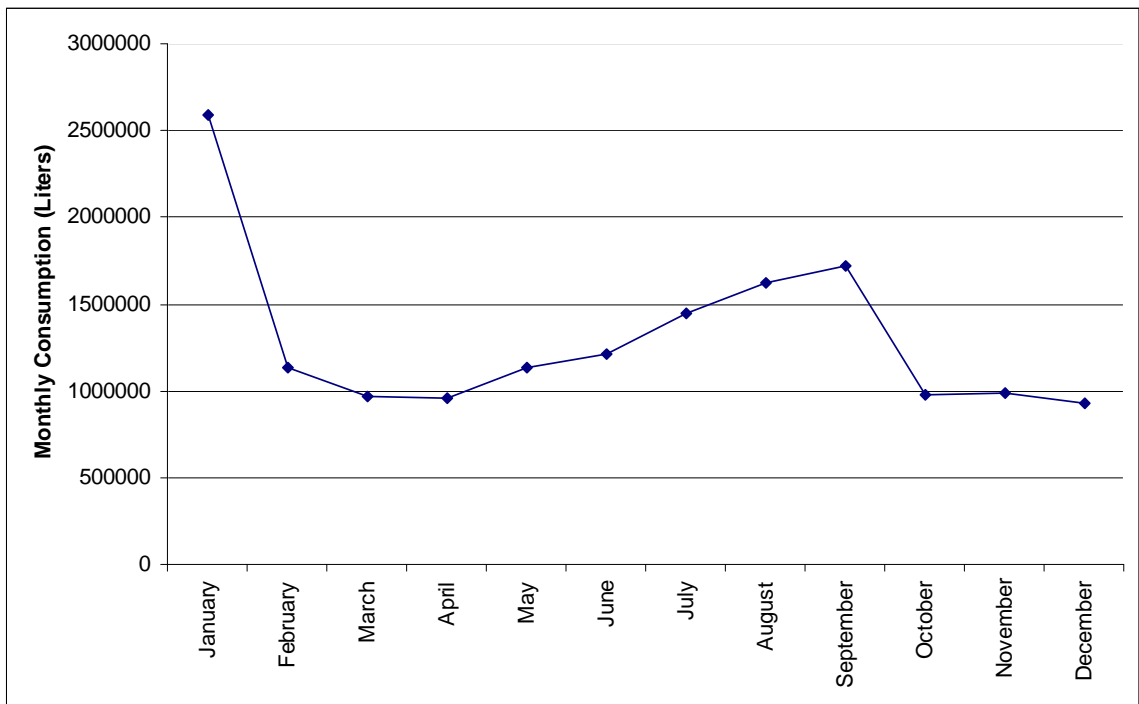
System overview:

- Water Source: Two shallow dug wells, 4.1 and 3.6 meters
- Treatment: None
- Disinfection: Chlorine
- Reservoir: Bolted Steel, (144,300 usg)
- Service connections: 50
- Length of mains: Approximately 3217 feet
- Water main material: Asbestos cement
- Average Daily Flow: 43 cu. meters

In 2011 the leak events were below average. As can be seen in Millstream 2011 Water Consumption Graph, January experienced a significant leak which was repaired. The water mains are mostly Asbestos Cement and are subject to radial fractures and softening over time. There were a few electrical failures that did not effect the operation and were easily corrected.

The reservoir had a few minor leaks which is typical with bolted steel construction. The chlorine feed rate was increased to provide an adequate disinfection level in the reservoir.

The reservoir is scheduled to be drawn down for a thorough inspection and cleaning. Sections of the AC water mains will be reviewed for systematic replacement. A potential connection to the District of Ucluelet's water system will be reviewed for emergency and future use.



Millstream Water Systems 2011 Monthly Consumption

4. Cougar Smith Park Small Water System

Cougar Smith Park is in the Sproat Lake area within the Alberni Valley on central Vancouver Island. The park is located on Faber Road situated approximately 8 miles (13 km) northwest of Port Alberni. It has a bike skills park, baseball diamond, tennis courts and playgrounds.

System overview:

- Water Source: Drilled well to 120 meters (400 feet)
- Treatment: Micro Filtration
- Disinfection: Ultraviolet (UV)
- Reservoir capacity and type: No reservoir
- Service connections: Two connections, one for the caretaker residence and one for the public building
- Length of mains: 144 meters (474 feet)
- Water main material: 1.25 inch Polyethylene
- Average Daily Flow: not metered

The water system infrastructure is located within a building within the park. Within the building are a pressure tank, an ultraviolet light disinfection system and a five micron particulate filter. It then supplies two public washrooms, an irrigation system, a drinking fountain and the caretaker's residence.

This system is being reviewed by the ACRD for its water quality and supply. There is a growing need for additional water for irrigation and further park improvements.

Receiving a VIHA Operating Permit will be the objective for the coming year. To obtain VIHA's approval, upgrades may be required; including finer filtration and a redesign of the treatment system may be needed.

5. Alberni Valley Regional Airport Small Water System

The Alberni Valley Regional Airport is located approximately 7 kilometers west of Port Alberni. A small water system at the Alberni Valley Regional Airport was constructed in 1993 to service the site caretaker's residence and the Airport Terminal Building. The Terminal Building has washroom facilities which are available for the three rented offices and to the public. There is an exterior hose bib that is used for watering plants and washing vehicles.

The microbiological activity in the well water appears to be active during times of high water level. This has been documented this past year and in previous years linking it to higher precipitation in the winter. With VIHA's recommendation and approval the system was equipped with micro filtration and UV disinfection.

A water meter was also installed to record water consumption and provide a baseline in determining future demand.

System overview:

- Water Source: Shallow dug well to 5.5 meters deep (18 feet)
- Treatment: Micro Filtration
- Disinfection: Ultraviolet (UV)
- Reservoir capacity and type: No reservoir
- Service connections: Three connections, two caretaker connections and the airport terminal building
- Length of mains: approximately 350 meters of 38mm (1.5 inch)
- Water main material: Polyethylene pipe
- Average Daily Flow: System not metered

6. Alberni Valley Landfill

The Alberni Valley Landfill is located north west of Port Alberni off of McCoy Lake road.

System overview:

- Water Source: Sproat Lake via Catalyst Paper Water Main.
- Treatment: None
- Disinfection: None (non potable system)
- Reservoir capacity and type: Bolted Steel 970 cu.m. (213,000 I.G.)
- Service connections: Three connections, scale building, work shop, caretakers building
- Length of mains: 1250 m (4100 feet)
- Water main material: Polyvinyl chloride
- Average Daily Flow: Not metered

The Alberni Valley Landfill water system is for non potable water for operational use only and is not meant for public consumption.

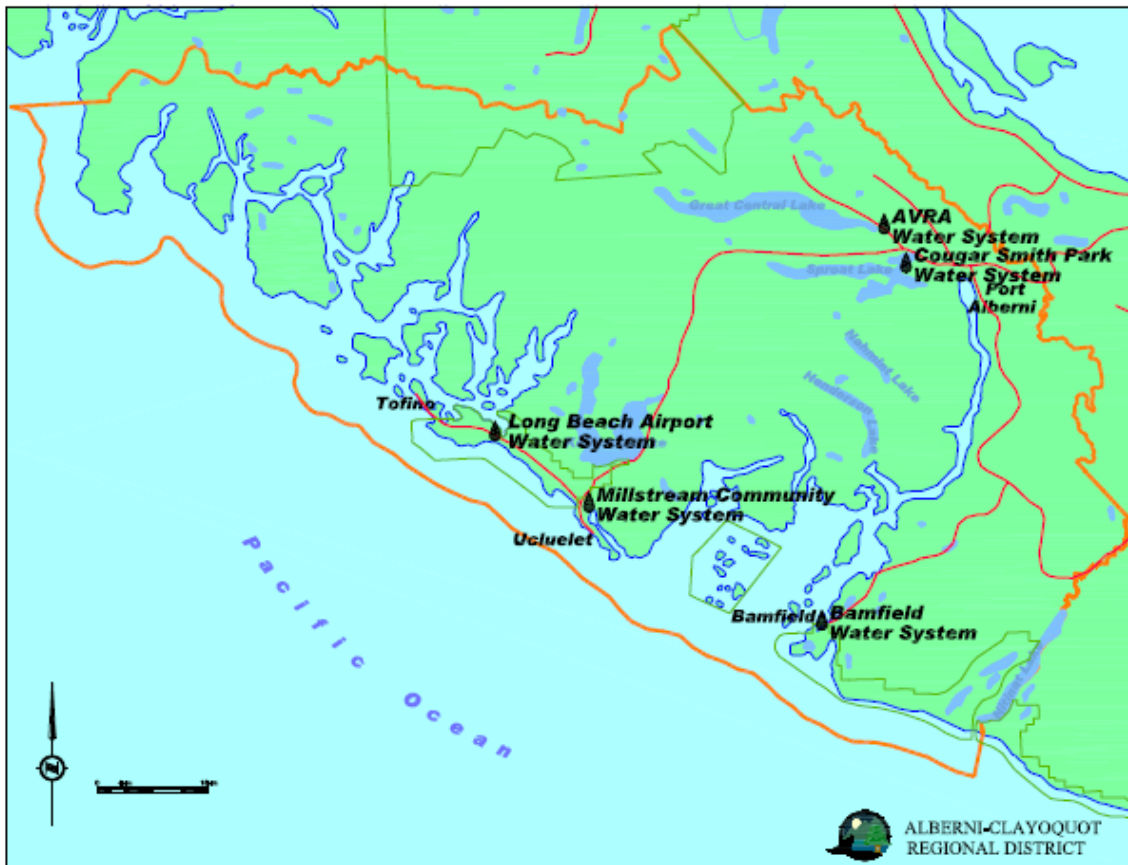
7. West Coast Landfill

The West Coast Landfill is located adjacent to Pacific Rim National Park Reserve, between the Towns of Tofino and Ucluelet.

System overview:

- Water Source: Shallow dug well
- Treatment: None
- Disinfection: None (non potable system)
- Reservoir capacity and type: No reservoir
- Service connections: One connection to the scale building
- Length of mains: Approximately 20 m (65 feet)
- Water main material: Polyethylene
- Average Daily Flow: not metered

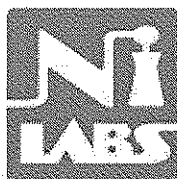
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Alberni Clayoquot Regional District Water System

Appendix A

Certificate of Analysis



North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

Certificate of Analysis

Report To: Regional District of Alberni &
Clayoquot
John Thomas
3008 5th Ave.
Port Alberni, BC V9Y 2E3
V9Y 2E3

Lab Number: 92717
Date Reported: 18 Jan 12
Date Completed: 18 Jan 12
Date Received: 10 Jan 12 10:50

92717-01 Alberni Valley Reg Airport

Sampled By: John
Sampling Date: 9 Jan 12 0:00

Test	Result	Units	Drinking Water Guideline
Fluoride	<0.05	mg/L	1.5 MAC
Chloride	3.0	mg/L	250 AO
Nitrate (N)	0.07	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	<0.5	mg/L	500 AO
T-Aluminium	0.041	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	<0.0002	mg/L	0.010 MAC
T-Barium	0.001	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	0.006	mg/L	5 IMAC
T-Cadmium	<0.00001	mg/L	0.005 MAC
T-Calcium	3.75	mg/L	
T-Chromium	0.0012	mg/L	0.05 MAC
T-Cobalt	0.00006	mg/L	
T-Copper	0.048	mg/L	1.0 AO
T-Iron	0.626	mg/L	0.3 AO
T-Lead	0.0083	mg/L	0.010 MAC
T-Lithium	<0.001	mg/L	
T-Magnesium	0.63	mg/L	
T-Manganese	0.04	mg/L	0.05 AO
T-Molybdenum	<0.0001	mg/L	
T-Nickel	<0.001	mg/L	
T-Phosphorus	<0.01	mg/L	
T-Potassium	<0.1	mg/L	

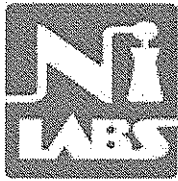
AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC
> = Greater than; < = Less than

Results relate only to samples as submitted. This certificate must not be reproduced, except in its entirety, without written consent from the laboratory.

Canadian Drinking Water Guidelines as listed on Dec. 5th, 2005 and are subject to

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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

92717-01 Alberni Valley Reg Airport

Sampled By: John

Sampling Date: 9 Jan 12 0:00

Test	Result	Units	Drinking Water Guideline
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	3.68	mg/L	
T-Silver	0.00007	mg/L	
T-Sodium	3.3	mg/L	200 AO
T-Strontium	0.014	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	0.0012	mg/L	
T-Titanium	0.002	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC
T-Vanadium	0.0053	mg/L	
T-Zinc	0.014	mg/L	5 AO
Hardness (CaCO ₃)	12	mg/L	
Colour - Apparent	6	Colour units	15 AO
Tannins & Lignins	<0.1	mg/L	0.4 AO
UV Transmittance	98.4	%/cm	
pH	6.2	pH Units	6.5-8.5
Alkalinity	<20	mg/L (CaCO ₃)	
Turbidity	0.9	NTU's	5 AO
Total Dissolved Solids (conductivity ca	29	mg/L	500 AO

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

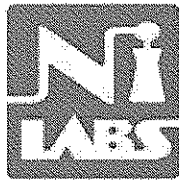
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North Island Laboratories

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Certificate of Analysis

Report To: Regional District of Alberni &
Clayoquot
John Thomas
3008 5th Ave.
Port Alberni, BC V9Y 2E3
V9Y 2E3

Lab Number: 91833
Date Reported: 6 Dec 11
Date Completed: 6 Dec 11
Date Received: 23 Nov 11 10:58

91833-01 Tofino Airport Raw

Sampled By:

Sampling Date: 22 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Coliforms (DES)	>200.5	MPN/100mL	<1
E. coli (DES)	<1.0	MPN/100mL	<1
pH	7.0	pH Units	6.5-8.5
Alkalinity	<20	mg/L (CaCO3)	
Turbidity	6.3	NTU's	5 AO
Total Dissolved Solids (conductivity ca	44	mg/L	500 AO
Fluoride	<0.05	mg/L	1.5 MAC
Chloride	10.1	mg/L	250 AO
Nitrate (N)	<0.05	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	1.9	mg/L	500 AO
T-Aluminium	0.028	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	0.0003	mg/L	0.010 MAC
T-Barium	0.005	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	0.007	mg/L	5 IMAC
T-Cadmium	<0.00001	mg/L	0.005 MAC
T-Calcium	6.06	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	0.00052	mg/L	
T-Copper	0.002	mg/L	1.0 AO
T-Iron	1.29	mg/L	0.3 AO
T-Lead	0.0006	mg/L	0.010 MAC
T-Lithium	<0.001	mg/L	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

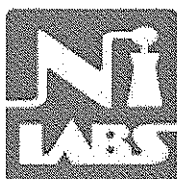
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• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

91833-01 Tofino Airport Raw

Sampled By:

Sampling Date: 22 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
T-Magnesium	1	mg/L	
T-Manganese	0.118	mg/L	0.05 AO
T-Molybdenum	0.0004	mg/L	
T-Nickel	0.003	mg/L	
T-Phosphorus	<0.01	mg/L	
T-Potassium	0.6	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	0.17	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	4.62	mg/L	200 AO
T-Strontium	0.024	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	<0.0001	mg/L	
T-Titanium	<0.001	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC
T-Vanadium	<0.0001	mg/L	
T-Zinc	0.035	mg/L	5 AO
Hardness (CaCO ₃)	19	mg/L	
Colour - Apparent	120	Colour units	15 AO
Tannins & Lignins	0.3	mg/L	0.4 AO
UV Transmittance	70.5	%/cm	

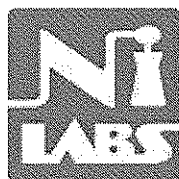
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North Island Laboratories

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Certificate of Analysis

Report To: Regional District of Alberni &
Clayoquot
John Thomas
3008 5th Ave.
Port Alberni, BC V9Y 2E3
V9Y 2E3

Lab Number: 91832
Date Reported: 6 Dec 11
Date Completed: 6 Dec 11
Date Received: 23 Nov 11 10:53

91832-01 Millstream Raw

Sampled By:

Sampling Date: 22 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Coliforms (DES)	2.0	MPN/100mL	<1
E. coli (DES)	<1.0	MPN/100mL	<1
pH	7.3	pH Units	6.5-8.5
Alkalinity	96	mg/L (CaCO3)	
Turbidity	<0.5	NTU's	5 AO
Total Dissolved Solids (conductivity ca	170	mg/L	500 AO
Fluoride	<0.05	mg/L	1.5 MAC
Chloride	13.1	mg/L	250 AO
Nitrate (N)	0.93	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	5.2	mg/L	500 AO
T-Aluminium	<0.005	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	0.0003	mg/L	0.010 MAC
T-Barium	0.002	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	0.032	mg/L	5 IMAC
T-Cadmium	<0.00001	mg/L	0.005 MAC
T-Calcium	32.2	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	0.00003	mg/L	
T-Copper	<0.001	mg/L	1.0 AO
T-Iron	0.01	mg/L	0.3 AO
T-Lead	<0.0001	mg/L	0.010 MAC
T-Lithium	<0.001	mg/L	

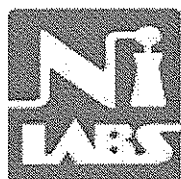
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North Island Laboratories

• 2755 B. Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

91832-01 Millstream Raw

Sampled By:

Sampling Date: 22 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
T-Magnesium	6.18	mg/L	
T-Manganese	<0.005	mg/L	0.05 AO
T-Molybdenum	<0.0001	mg/L	
T-Nickel	<0.001	mg/L	
T-Phosphorus	<0.01	mg/L	
T-Potassium	0.8	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	<0.05	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	11.4	mg/L	200 AO
T-Strontium	0.087	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	<0.0001	mg/L	
T-Titanium	<0.001	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC
T-Vanadium	0.0009	mg/L	
T-Zinc	0.002	mg/L	5 AO
Hardness (CaCO ₃)	110	mg/L	
Colour - Apparent	<5	Colour units	15 AO
Tannins & Lignins	<0.1	mg/L	0.4 AO
UV Transmittance	97.8	%/cm	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

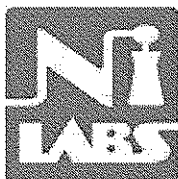
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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

Certificate of Analysis

Report To: Regional District of Alberni &
Clayoquot
John Thomas
3008 5th Ave.
Port Alberni, BC V9Y 2E3
V9Y 2E3

Lab Number: 91955
Date Reported: 8 Dec 11
Date Completed: 8 Dec 11
Date Received: 29 Nov 11 9:42

91955-01 Sugsaw Lake - Bamfield

Sampled By: John Thomas
Sampling Date: 28 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Coliforms (DES)	83.1	MPN/100mL	<1
E. coli (DES)	1.0	MPN/100mL	<1
pH	6.7	pH Units	6.5-8.5
Alkalinity	<20	mg/L (CaCO3)	
Turbidity	<0.5	NTU's	5 AO
Total Dissolved Solids (conductivity ca	20	mg/L	500 AO
Fluoride	<0.05	mg/L	1.5 MAC
Chloride	3.5	mg/L	250 AO
Nitrate (N)	0.05	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	1.5	mg/L	500 AO
T-Aluminium	0.153	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	<0.0002	mg/L	0.010 MAC
T-Barium	0.004	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	0.02	mg/L	5 IMAC
T-Cadmium	<0.00001	mg/L	0.005 MAC
T-Calcium	2.22	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	<0.00002	mg/L	
T-Copper	<0.001	mg/L	1.0 AO
T-Iron	0.094	mg/L	0.3 AO
T-Lead	<0.0001	mg/L	0.010 MAC
T-Lithium	<0.001	mg/L	

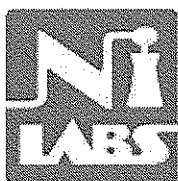
AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC
> = Greater than; < = Less than

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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

91955-01 Sugsaw Lake - Bamfield

Sampled By: John Thomas

Sampling Date: 28 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
T-Magnesium	0.49	mg/L	
T-Manganese	0.013	mg/L	0.05 AO
T-Molybdenum	<0.0001	mg/L	
T-Nickel	<0.001	mg/L	
T-Phosphorus	<0.01	mg/L	
T-Potassium	0.2	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	1.36	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	2.62	mg/L	200 AO
T-Strontium	0.012	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	<0.0001	mg/L	
T-Titanium	0.002	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC
T-Vanadium	0.0002	mg/L	
T-Zinc	0.001	mg/L	5 AO
Hardness (CaCO ₃)	7.6	mg/L	
Colour - Apparent	54	Colour units	15 AO
Tannins & Lignins	1	mg/L	0.4 AO
UV Transmittance	60.5	%/cm	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

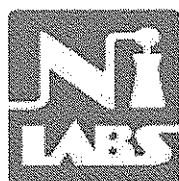
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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

Certificate of Analysis

Report To: Regional District of Alberni &
Clayoquot
John Thomas
3008 5th Ave.
Port Alberni, BC V9Y 2E3
V9Y 2E3

Lab Number: 92003
Date Reported: 12 Dec 11
Date Completed: 12 Dec 11
Date Received: 30 Nov 11 10:39

92003-01 Cougar Smith Park Raw Water

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Coliforms (DES)	<1.0	MPN/100mL	<1
E. coli (DES)	<1.0	MPN/100mL	<1
pH	8.8	pH Units	6.5-8.5
Alkalinity	87	mg/L (CaCO3)	
Turbidity	2.7	NTU's	5 AO
Total Dissolved Solids (conductivity ca	180	mg/L	500 AO
Fluoride	0.53	mg/L	1.5 MAC
Chloride	6.8	mg/L	250 AO
Nitrate (N)	<0.05	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	32.6	mg/L	500 AO
T-Aluminium	0.018	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	0.0085	mg/L	0.010 MAC
T-Barium	0.021	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	3.34	mg/L	5 IMAC
T-Cadmium	0.00001	mg/L	0.005 MAC
T-Calcium	8.69	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	0.00008	mg/L	
T-Copper	<0.001	mg/L	1.0 AO
T-Iron	0.188	mg/L	0.3 AO
T-Lead	0.0002	mg/L	0.010 MAC
T-Lithium	0.01	mg/L	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

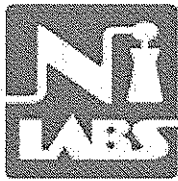
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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

92003-01 Cougar Smith Park Raw Water

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
T-Magnesium	1.03	mg/L	
T-Manganese	<0.005	mg/L	0.05 AO
T-Molybdenum	0.011	mg/L	
T-Nickel	<0.001	mg/L	
T-Phosphorus	0.02	mg/L	
T-Potassium	1.1	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	3.74	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	49.5	mg/L	200 AO
T-Strontium	0.17	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	<0.0001	mg/L	
T-Titanium	<0.001	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC
T-Vanadium	0.0023	mg/L	
T-Zinc	0.002	mg/L	5 AO
Hardness (CaCO ₃)	27	mg/L	
Colour - Apparent	15	Colour units	15 AO
Tannins & Lignins	<0.1	mg/L	0.4 AO
UV Transmittance	95.8	%/cm	

92003-02 C.S.P. Water Treated Treated

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Coliforms (DES)	<1.0	MPN/100mL	<1
E. coli (DES)	<1.0	MPN/100mL	<1
pH	8.8	pH Units	6.5-8.5
Alkalinity	80	mg/L (CaCO ₃)	
Turbidity	<0.5	NTU's	5 AO
Total Dissolved Solids (conductivity ca	180	mg/L	500 AO
Fluoride	0.55	mg/L	1.5 MAC

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

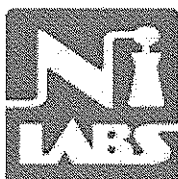
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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

92003-02 C.S.P. Water Treated Treated

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Chloride	7.2	mg/L	250 AO
Nitrate (N)	<0.05	mg/L	10 MAC
Nitrite (N)	<0.05	mg/L	1 MAC
Sulphate	33.0	mg/L	500 AO
T-Aluminium	<0.005	mg/L	0.1 Operational Std.
T-Antimony	<0.0002	mg/L	0.006 MAC
T-Arsenic	0.0083	mg/L	0.010 MAC
T-Barium	0.02	mg/L	1.0 MAC
T-Beryllium	<0.00004	mg/L	
T-Bismuth	<0.001	mg/L	
T-Boron	3.39	mg/L	5 IMAC
T-Cadmium	0.00001	mg/L	0.005 MAC
T-Calcium	8.78	mg/L	
T-Chromium	<0.0004	mg/L	0.05 MAC
T-Cobalt	0.00003	mg/L	
T-Copper	0.003	mg/L	1.0 AO
T-Iron	0.021	mg/L	0.3 AO
T-Lead	0.0023	mg/L	0.010 MAC
T-Lithium	0.011	mg/L	
T-Magnesium	1.05	mg/L	
T-Manganese	<0.005	mg/L	0.05 AO
T-Molybdenum	0.0114	mg/L	
T-Nickel	0.003	mg/L	
T-Phosphorus	0.017	mg/L	
T-Potassium	1.1	mg/L	
T-Selenium	<0.0006	mg/L	0.01 MAC
T-Silicon	3.72	mg/L	
T-Silver	<0.00001	mg/L	
T-Sodium	50.3	mg/L	200 AO
T-Strontium	0.175	mg/L	
T-Thallium	<0.00001	mg/L	
T-Tin	<0.0001	mg/L	
T-Titanium	<0.001	mg/L	
T-Uranium	<0.0004	mg/L	0.02 MAC

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

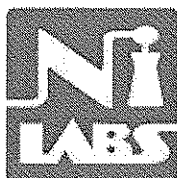
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North Island Laboratories

• 2755 B Moray Avenue, Courtenay, B.C. V9N 8M9 Tel: (250) 338-7786 Fax: (250) 338-7553

92003-02 C.S.P. Water Treated Treated

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
T-Vanadium	0.0021	mg/L	
T-Zinc	0.011	mg/L	5 AO
Hardness (CaCO ₃)	26	mg/L	
Colour - Apparent	<5	Colour units	15 AO
Tannins & Lignins	<0.1	mg/L	0.4 AO
UV Transmittance	98.1	%/cm	

92003-03 C.S.P. Water Pre-Filter

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Suspended Solids	5.0	mg/L	

92003-04 C.S.P. Water Post Filter

Sampled By:

Sampling Date: 29 Nov 11 0:00

Test	Result	Units	Drinking Water Guideline
Total Suspended Solids	<5.0	mg/L	

AO = Aesthetic Objective; MAC = Max. Allowable Concentration; IMAC = Interim MAC

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Appendix B

Facility Sampling History

ALBERNI VALLEY AIRPORT

Facility Location:

7500 AIRPORT Road
Port Alberni

Facility Information:

Facility Type: DWS

Facility Sampling History:

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
Alberni Valley Airport, Airport	12-Dec-2011	4	L1
Alberni Valley Airport, Airport	21-Nov-2011	L1	L1
Alberni Valley Airport, Airport	24-Oct-2011	4	L1
Alberni Valley Airport, Airport	13-Oct-2011	8	L1
Alberni Valley Airport, Airport	26-Sep-2011	L1	L1
Alberni Valley Airport, Airport	8-Aug-2011	L1	L1
Alberni Valley Airport, Airport	19-Jul-2011	L1	L1
Alberni Valley Airport, Airport	20-Jun-2011	L1	L1
Alberni Valley Airport, Airport	16-May-2011	L1	L1
Alberni Valley Airport, Airport	27-Apr-2011	L1	L1
Alberni Valley Airport, Airport	7-Mar-2011	L1	L1
Alberni Valley Airport, Airport	17-Jan-2011	L1	L1
Alberni Valley Airport, Airport	11-Jan-2011	L1	L1

TOFINO AIRPORT WATER SYSTEM

Facility Location:

3008 5th Avenue
Port Alberni

Facility Information:

Facility Type: DWS

Facility Sampling History:

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
Pumphouse/Estowista	7-Dec-2011	L1	L1
Reservoir/pumphouse	7-Dec-2011	L1	L1
Pumphouse/Estowista	16-Nov-2011	L1	L1
Reservoir/pumphouse	16-Nov-2011	L1	L1
Pumphouse/Estowista	18-Oct-2011	L1	L1
Reservoir/pumphouse	18-Oct-2011	L1	L1
Pumphouse/Estowista	20-Sep-2011	L1	L1
Reservoir/pumphouse	20-Sep-2011	L1	L1
Pumphouse/Estowista	24-Aug-2011	L1	L1
Reservoir/pumphouse	24-Aug-2011	L1	L1
Pumphouse/Estowista	20-Jul-2011	L1	L1
Reservoir/pumphouse	20-Jul-2011	L1	L1
Pumphouse/Estowista	22-Jun-2011	L1	L1
Reservoir/pumphouse	22-Jun-2011	L1	L1
Pumphouse/Estowista	24-May-2011	L1	L1
Reservoir/pumphouse	24-May-2011	L1	L1
Pumphouse/Estowista	20-Apr-2011	L1	L1
Reservoir/pumphouse	20-Apr-2011	L1	L1
Pumphouse/Estowista	22-Mar-2011	L1	L1
Reservoir/pumphouse	22-Mar-2011	L1	L1
Pumphouse/Estowista	22-Feb-2011	L1	L1
Reservoir/pumphouse	22-Feb-2011	L1	L1
Pumphouse/Estowista	17-Jan-2011	L1	L1
Reservoir/pumphouse	17-Jan-2011	L1	L1

MILLSTREAM COMMUNITY WATER SYSTEM

Facility Location:

3008 Fifth Street
Port Alberni

Facility Information:

Facility Type: DWC

Facility Sampling History:

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
John Gouweleeuw's Residence	7-Dec-2011	L1	L1
McConnell Residence, 262 Karn Avenue	7-Dec-2011	L1	L1
John Gouweleeuw's Residence	16-Nov-2011	L1	L1
McConnell Residence, 262 Karn Avenue	16-Nov-2011	L1	L1
John Gouweleeuw's Residence	18-Oct-2011	L1	L1
McConnell Residence, 262 Karn Avenue	18-Oct-2011	L1	L1
John Gouweleeuw's Residence	20-Sep-2011	L1	L1
McConnell Residence, 262 Karn Avenue	20-Sep-2011	L1	L1
John Gouweleeuw's Residence	24-Aug-2011	L1	L1
McConnell Residence, 262 Karn Avenue	24-Aug-2011	L1	L1
John Gouweleeuw's Residence	20-Jul-2011	L1	L1
McConnell Residence, 262 Karn Avenue	20-Jul-2011	L1	L1
John Gouweleeuw's Residence	22-Jun-2011	L1	L1
McConnell Residence, 262 Karn Avenue	22-Jun-2011	L1	L1
John Gouweleeuw's Residence	24-May-2011	L1	L1
McConnell Residence, 262 Karn Avenue	24-May-2011	L1	L1
John Gouweleeuw's Residence	20-Apr-2011	L1	L1
McConnell Residence, 262 Karn Avenue	20-Apr-2011	L1	L1
John Gouweleeuw's Residence	21-Mar-2011	L1	L1
McConnell Residence, 262 Karn Avenue	21-Mar-2011	L1	L1
John Gouweleeuw's Residence	22-Feb-2011	L1	L1
McConnell Residence, 262 Karn Avenue	22-Feb-2011	L1	L1
John Gouweleeuw's Residence	8-Feb-2011	L1	L1
McConnell Residence, 262 Karn Avenue	8-Feb-2011	L1	L1
John Gouweleeuw's Residence	18-Jan-2011	L1	L1
McConnell Residence, 262 Karn Avenue	18-Jan-2011	L1	L1

BAMFIELD COMMUNITY WWS

Facility Location:

3008 Fifth Avenue
Bamfield

Facility Information:

Facility Type:

DWC

Facility Sampling History:

<u>Location</u>	<u>Date</u>	<u>Total Coliform</u>	<u>E. Coli</u>
Bamfield Marine Station, Bamfield	14-Dec-2011	L1	L1
Butler Residence, Bamfield	14-Dec-2011	L1	L1
Canadian Coast Guard Post, Bamfield	14-Dec-2011	L1	L1
Pump House Grappler Rd, Bamfield	14-Dec-2011	L1	L1
Bamfield Marine Station, Bamfield	21-Nov-2011	L1	L1
Butler Residence, Bamfield	21-Nov-2011	L1	L1
Canadian Coast Guard Post, Bamfield	21-Nov-2011	L1	L1
Pump House Grappler Rd, Bamfield	21-Nov-2011	L1	L1
Bamfield Marine Station, Bamfield	8-Nov-2011	L1	L1
Butler Residence, Bamfield	8-Nov-2011	L1	L1
Canadian Coast Guard Post, Bamfield	8-Nov-2011	L1	L1
Pump House Grappler Rd, Bamfield	8-Nov-2011	L1	L1
Bamfield Marine Station, Bamfield	27-Oct-2011	A	
Butler Residence, Bamfield	27-Oct-2011	A	
Canadian Coast Guard Post, Bamfield	27-Oct-2011	A	
Pump House Grappler Rd, Bamfield	27-Oct-2011	A	
Bamfield Marine Station, Bamfield	14-Sep-2011	L1	L1
Butler Residence, Bamfield	14-Sep-2011	L1	L1
Canadian Coast Guard Post, Bamfield	14-Sep-2011	L1	L1
Pump House Grappler Rd, Bamfield	14-Sep-2011	L1	L1
Bamfield Marine Station, Bamfield	2-Aug-2011	L1	L1
Butler Residence, Bamfield	2-Aug-2011	L1	L1
Canadian Coast Guard Post, Bamfield	2-Aug-2011	L1	L1
Pump House Grappler Rd, Bamfield	2-Aug-2011	L1	L1
Bamfield Marine Station, Bamfield	12-Jul-2011	L1	L1
Butler Residence, Bamfield	12-Jul-2011	L1	L1
Canadian Coast Guard Post, Bamfield	12-Jul-2011	L1	L1
Pump House Grappler Rd, Bamfield	12-Jul-2011	L1	L1
Bamfield Marine Station, Bamfield	14-Jun-2011	L1	L1
Butler Residence, Bamfield	14-Jun-2011	L1	L1
Canadian Coast Guard Post, Bamfield	14-Jun-2011	L1	L1

Pump House Grappler Rd, Bamfield	14-Jun-2011	L1	L1
Bamfield Marine Station, Bamfield	3-May-2011	L1	L1
Butler Residence, Bamfield	3-May-2011	L1	L1
Canadian Coast Guard Post, Bamfield	3-May-2011	L1	L1
Pump House Grappler Rd, Bamfield	3-May-2011	L1	L1
Bamfield Marine Station, Bamfield	5-Apr-2011	L1	L1
Butler Residence, Bamfield	5-Apr-2011	L1	L1
Canadian Coast Guard Post, Bamfield	5-Apr-2011	L1	L1
Pump House Grappler Rd, Bamfield	5-Apr-2011	L1	L1
Bamfield Marine Station, Bamfield	7-Mar-2011	L1	L1
Butler Residence, Bamfield	7-Mar-2011	L1	L1
Canadian Coast Guard Post, Bamfield	7-Mar-2011	L1	L1
Pump House Grappler Rd, Bamfield	7-Mar-2011	L1	L1
Bamfield Marine Station, Bamfield	7-Feb-2011	L1	L1
Butler Residence, Bamfield	7-Feb-2011	L1	L1
Canadian Coast Guard Post, Bamfield	7-Feb-2011	L1	L1
Pump House Grappler Rd, Bamfield	7-Feb-2011	L1	L1
Bamfield Marine Station, Bamfield	10-Jan-2011	L1	L1
Butler Residence, Bamfield	10-Jan-2011	L1	L1
Canadian Coast Guard Post, Bamfield	10-Jan-2011	L1	L1
Pump House Grappler Rd, Bamfield	10-Jan-2011	L1	L1

Appendix C

Drinking Water Quality Links

Drinking Water Quality Links:

- Guidelines for Canadian Drinking Water Quality
<http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index-eng.php>
- Drinking Water Protection Act:
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_01009_01
- Drinking Water Protection Regulation:
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/10_200_2003
- The Environmental Operators Certificate Program:
<http://www.eocp.org/>
- British Columbia Water and Wastewater Association:
<http://www.bcwwa.org/>
- Vancouver Island Health Authority – Water Quality
<http://www.viha.ca/mho/water/>