City of Parksville

2011 ANNUAL WATER REPORT

June 2012

Engineering and Operations Department

TABLE OF CONTENTS

1.0 Introduction:

All water suppliers, under their Operating Permit and conditions, are required to provide an annual report to their users with information such as explanation of water source, water test results, maintenance programs and improvements to the water system. The following document summarizes these requirements. City of Parksville operating conditions are shown in Appendix F.

This report has been submitted to the Vancouver Island Health Authority and is posted on the City of Parksville Website. www.Parksville.ca.

2.0 Parksville Water System:

The City of Parksville has approximately 4500 water connections serving over 11,000 permanent and seasonal residents as well as supplying water to the Regional District of Nanaimo - Nanoose Bay Peninsula system in the summer months.

These users get their drinking water from 3 sources.

- Englishman River Intake
- Springwood Well Field
- Railway Well Field

The water is treated using either liquid or gaseous chlorine and stored in 4 reservoirs at either end of the City.

2.1 Groundwater Wells:

The City's groundwater is pumped from a confined quadra sands aquifer that runs underground alongside the railway tracks from Trill Drive to the City's boundary in the southwest. The City currently has 18 production wells ranging from 0.9 l/s (12 IGPM) to 10.3 l/s (136 IGPM).
See **Appendix A** for Well locations.

Well Name	Well Depth (m)	Production (l/s, Igpm)
Springwood Well #1	31.9	0.9, 12
Springwood Well #2	10.4	Off Line
Springwood Well #3	25.3	1.3, 18
Springwood Well #4	9.8	Off Line
Springwood Well #5	31.0	6.0, 80
Springwood Well #6	31.1	6.7, 88
Springwood Well #7	40.2	9.1, 120
Springwood Well #8	39.4	10.3, 136
Springwood Well #10	25.6	9.0, 118
Springwood Well #11	30.6	7.0, 92
Railway Well#1	30.7	5.0, 66
Railway Well#2	32.2	5.3, 70
Railway Well#3	25.2	2.5, 33
Railway Well#4	22.5	1.7, 22
Railway Well#5	36.3	7.3, 97
Railway Well#6	36.7	6.2, 83
Railway Well#7	34.2	4.1, 55
Railway Well #8	28.6	4.5, 60
Trill Well#8	25.1	Off Line

2.2 River Intake:

Between May and October the City pumps water from the Englishman River at a maximum rate of 159 l/s (2100 IGPM) to keep up with summer demands. The water in the Englishman river is partially supplied from the Arrowsmith Dam. The Ministry of Environment, Fisheries and The Arrowsmith Water Service (AWS) developed an operating rule curve in an effort to conserve reservoir storage water for critical fisheries rearing periods. A minimum flow is released into the river based on this curve between June 1st and October 31st. (See **Appendix B**)

2.3 Arrowsmith Dam:

The City of Parksville, The Regional District of Nanaimo, and The Town of Qualicum are partners in the Arrowsmith Water Service (AWS). The dam is located at Arrowsmith Lake approximately 19km south of Parksville. It was commissioned in September 2000. The dam has a capacity of 9,000,000 m3 and is operated and maintained by City of Parksville staff. Water is released to the Englishman river through 2 pipes, a 900 mm and a 600 mm with flows and lake levels monitored by the City's Supervisory Control and Data Acquisition (SCADA) system.

See **Appendix B** for Arrowsmith Dam Lakes Levels 2011.

2.4 Reservoirs:

Water that has been pumped either from the ground or from the river is stored in 5 reservoirs. Reservoirs numbers 1, 2 and 4 are located in the Springwood Water Compound on Despard Road. These 3 are concrete with 2 being partially below ground and one above. Storage capacities are:

- Reservoir #1 - 616 m^3 (135,500 Imp. gal).
- Reservoir #2 - 2023 m^3 (445,000 Imp. gal)
- Reservoir #4 - 4559 m^3 (1,000,000 Imp. gal).

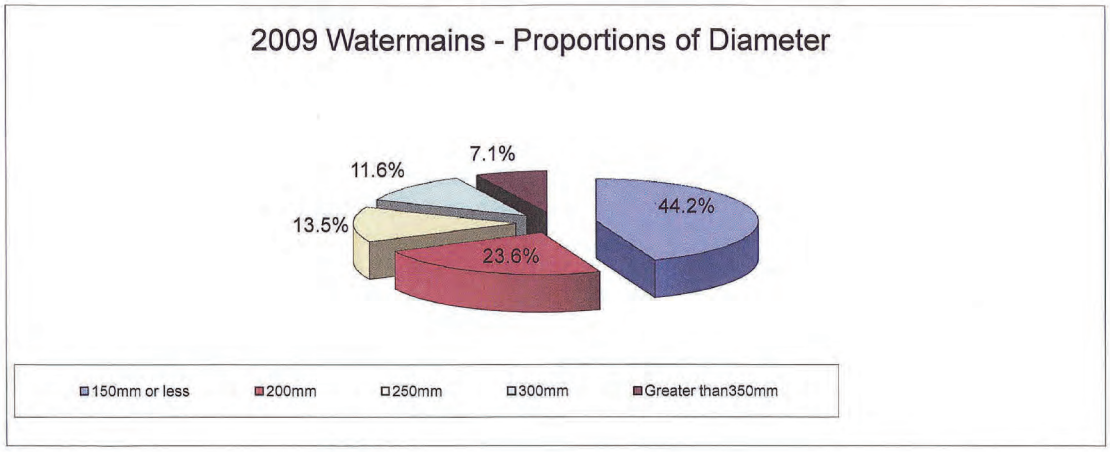
There are 2 additional reservoirs at the Top Bridge Park area, numbers 3 and 5. Reservoir #5 is a glass fused steel tank, Reservoir #3 is a steel tank although currently not in use. Storage capacities are:

- Reservoir #3 - 671m^3 (148,000 Imp. gal.)
- Reservoir #5 - 4300 m^3 (950,000 Imp. gal).

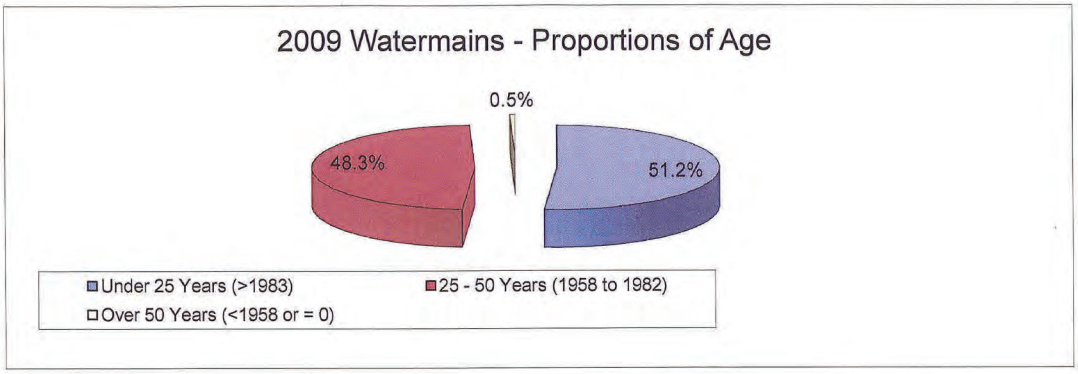
3.0 Distribution System:

The distribution system consists of 54 km of PVC (plastic) pipe, 8.3 km of Ductile Iron pipe and 32 km of AC (Asbestos Cement) pipe. Sizes range from 4" to 14".
There are 468 fire hydrants and one Pressure Reducing Valve (PRV).

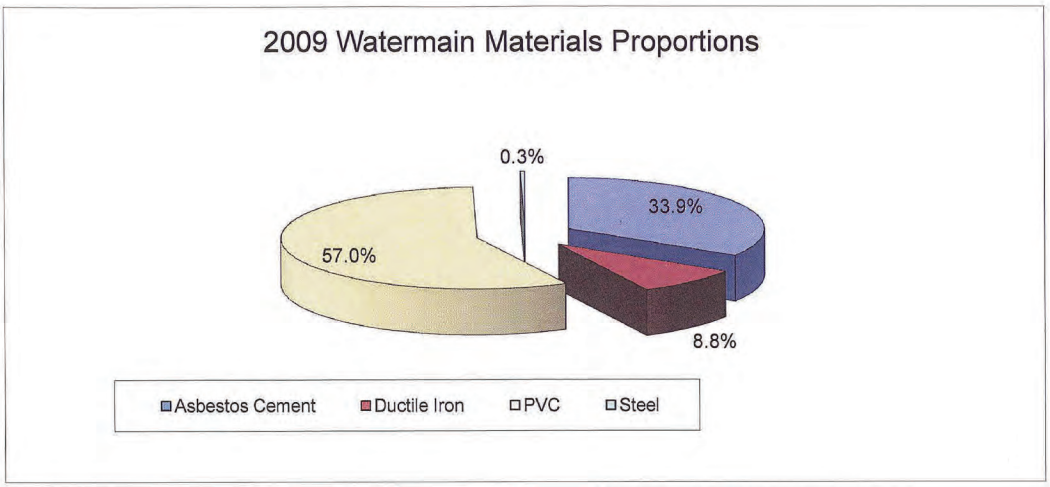
Like all municipalities, the infrastructure is aging and water mains are being replaced through capital improvements. The following shows the size, age and material of the mains in the Parksville Water System in 2009. Some of these pipes have been replaced since 2009 but 2011 data has not yet been graphed.



2009 Watermains Proportions of Diameter				
Diameter	No Pipes	Distance (km)	Percentage	Type
150mm or less	559	41.960	44.2%	Distribution Mains
200mm	336	22.467	23.6%	67.8%
250mm	166	12.830	13.5%	Supply Mains
300mm	142	11.000	11.6%	32.2%
Greater than350mm	80	6.757	7.1%	
Total:	**1283**	**95.014**	**km**	



2009 Watermains Proportions of Age			
Age	No Pipes	Distance (km)	Percentage
Under 25 Years (>1983)	696	48.676	51.2%
25 - 50 Years (1958 to 1982)	559	45.862	48.3%
Over 50 Years (<1958 or = 0)	28	0.476	0.5%
Total:	**1283**	**95.014**	**km**



2009 Watermains Proportions of Materials		
Material Types	Distance (km)	Percentage
Asbestos Cement	32.184	33.9%
Ductile Iron	8.318	8.8%
PVC	54.186	57.0%
Steel	0.327	0.3%
Total:	**95.014**	**km**

3.1 Pressure Zones:

The City is divided into 2 pressure zones. A low pressure and a high pressure. The low pressure is a gravity fed system based on the elevation of Reservoir #4 and Reservoir #5. A top water level of 73.74m above sea level (geodetic) gives a range of 55 psi to 85 psi throughout the system, depending on the geographic location.

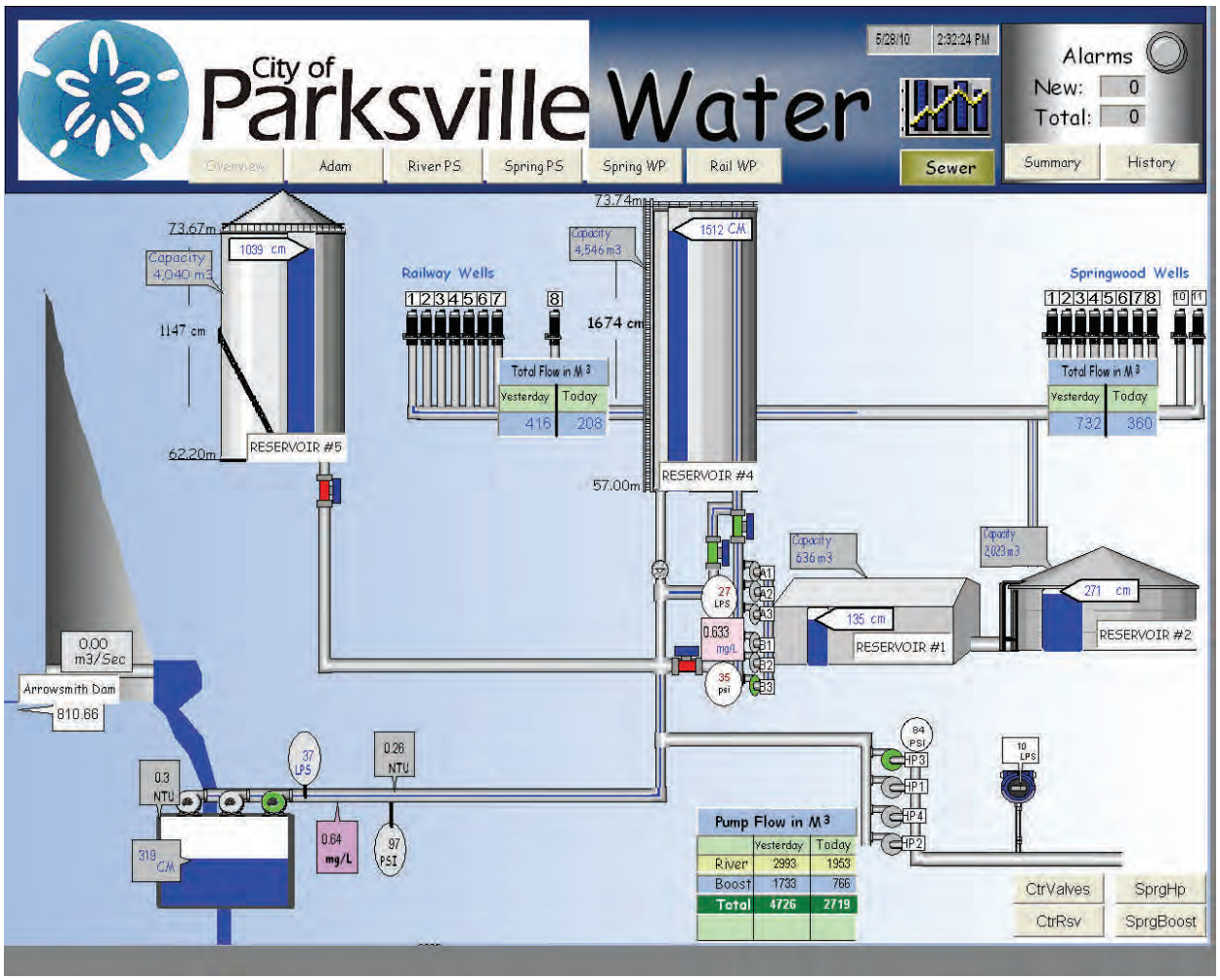
The high pressure system initially was developed for higher elevation regions of the city that didn't have sufficient pressures or flows to meet fire fighting flows. This high pressure zone has been expanded to areas furthest from the pump stations that lose pressure and flow due to line losses. In order to maintain a balance between high and low pressures but still keep a safe pressure in the lower areas, a PRV was installed to drop the pressure from 80psi to 60psi.

The high pressure water in this zone is supplied from 4 pumps, a 15hp, 2-40hp and a 100 hp. These pumps are controlled through the SCADA system that automatically watches flows and switches on however many pumps it needs to meet the flow requirements.

See **Appendix C** for Map of Pressure Zone Boundaries.

4.0 SCADA (Supervisory Control and Data Acquisition):

The water system and sewer pump stations are controlled by a computerized control system called SCADA. This system allows the Operators to monitor reservoir levels, the on/off status and flows of pumps, and monitor chlorine residuals. The operator can change set points and monitor the system remotely. Alarms are automatically called out to City staff that monitor the system 24 hours a day, 7 days a week.



5.0 Water Sampling and Testing

5.1 Bacteriological

As required by the Vancouver Island Health Authority (VIHA), City staff take weekly bacteriological samples to be tested for Total Coliforms and e-Coli Bacteria. There are 16 dedicated sampling sites throughout the city.

See **Appendix D** for 2011 test results (L1 means Less than 1 - Acceptable)

5.2 Full Spectrum Analysis

In addition to weekly sampling throughout the distribution system, the City also sends samples from the source waters once per year, in the Fall, for a full spectrum analysis. As seen in Appendix E, parameters such as metals (iron, manganese) conventional parameters (pH, Turbidity, Hardness) and disinfection byproducts (Trihalomethane) are tested.

The source water is aesthetically acceptable as set by the "Guidelines for Canadian Drinking Water Summary Table". Aesthetic qualities apply to certain substances or characteristics such as high Iron content which will stain fixtures red or Manganese which will stain black.
Hardness in the water comes from calcium carbonate (CaCO3). The river water is considered "Soft" under the guidelines and the Well water is "Moderate". Hardness levels above 500 mg/l are normally considered unacceptable.
All parameters meet the Canadian Drinking Water Guidelines.

See **Appendix E** for the 2011 Full Spectrum Analysis of the Parksville Water System Source Water. Note: The water tested is in it's Raw form before any type of treatment.

6.0 Water Quality Complaints

The Engineering and Operations Department had very few water quality complaints throughout 2011. Most were in the high pressure zone related to “brown or dirty” water. A majority of these complaints were on dead end lines during periods of high flows. City of Parksville crews flushed the mains through a hydrant or flushout at a spot closest to the dead end and the problems were cleared up.

There were occasional complaints about the taste of chlorine in the water. Chlorine residuals are tested weekly throughout the system and are kept at a safe level. Besides recommending a filter to remove the chlorine within the home, there is not much we can do about it.

There were a few hardness related complaints mostly contributed to new homeowners from other municipalities who are used to different water composition. There were also a few concerns about calcium build up in washing machines and dishwashers although the water is only considered “Moderately Hard” on the Hardness Scale. This rating drops throughout the summer when the river supply is mixed with the well supply. The river water is considered “Soft”.

7.0 Englishman River Water Service Joint Venture Agreement

In June 2011, the partners in the Arrowsmith Water Service (AWS) renewed a revised AWS joint venture agreement. The agreement now addresses governance and funding of the bulk water service without referencing participation in the next phase of capital infrastructure. This change addresses Qualicum Beach's interest in not wishing to cost share in the water intake, treatment plant and distribution infrastructure at this time.

Voting of the AWS management board follows a weighted vote system rather than a unanimous vote system to better reflect a governance model that is similar to a regional district governance structure.

The Englishman River Water Service joint venture agreement parallels and complements the Arrowsmith Water Service joint venture agreement; it has only the City of Parksville and the Regional District of Nanaimo as joint venture participants.

The Englishman River Water Service joint venture agreement describes the infrastructure (intake and treatment plant) that will be cost shared by its two joint venture participants, and contains language that gives the option for the Town of Qualicum Beach to join the agreement in the future. While the Town of Qualicum Beach would not be a signatory to the Englishman River joint venture agreement, under the AWS Agreement the town would have the option to "buy in" to this infrastructure at a future date. Qualicum Beach would have the right to do so due to the rights it possesses as a joint venture partner on the AWS water licence for the Englishman River and as joint owner of the Arrowsmith Lake dam and related infrastructure.

Englishman River Water Service joint venture agreement (percentages of interest).

- City of Parksville 74%
- Regional District of Nanaimo 26%

For more information visit www.arrowsmithwaterservice.ca

8.0 Routine Maintenance Program

8.1 Distribution

- Water mains are flushed using a unidirectional flushing program
- Air relief valves are cleaned
- Fireline meters are cleaned
- Fire Hydrants are completely disassembled and inspected on a 2 year rotation
- Paint and brush out around hydrants as needed
- All irrigation backflow prevention devices tested and repaired if needed

8.2 Wells

- Daily security check of all wells
- Rehabilitation of 1-2 wells per year
- Pumps and motors replaced as necessary
- Filling chlorine tank on Springwood Well #1 as needed
- Annual water sampling

8.3 River Intake

- Winter maintenance of chlorination system while off line
- Weekly blowing of air lines through intake screens
- Daily checks of pump flows and chlorine levels
- Monthly calibration of turbidity analyzers

8.4 Reservoirs

- Daily security check of tanks and compounds
- Yearly cleaning of Reservoir #1 and 2.
- Clean Reservoir #4 and 5 using divers every 5 years.
- Sustaining valves cleaned monthly

8.5 Pump Stations

- Daily checks of pumps and chlorination system
- Security checks of compounds
- Bi-Annual calibration of chlorine analyzers and turbidimeters

9.0 2011 Improvements:

- Purchased a new chlorine control valve and regulator for River Pump Station
- Upgrades SCADA HMI computer
- Installed 2 new security cameras at Arrowsmith Lake
- Continue to replace old style flush outs at dead ends to improve flows while flushing
- Rebuilt sewer lift station pump
- Replace chlorine analyzer

10.0 2011 Capital Projects:

- Started McMillan Street upgrades: water, sewer, storm, hydro
- Water treatment plant piloting.
- Purchased property for future water treatment plant
- One year of raw water quality analysis starting September 2011

11.0 2012 Capital Projects and Improvements:

- Continue upgrading SCADA data historian
- Continue with well rehabilitation on aging wells
- Starting a water meter change out program
- Continue developing the cross connection program
- Upgrade Springwood wells communication lines
- Continuing to replace aging water mains for better distribution.
- As per the Drinking Water Protection Act, the 4321 rule affecting surface water supplies is being addressed through the Arrowsmith Water Service and the Englishman River Water Service with an engineering study looking at an updated river intake and water treatment plant.
- Complete McMillan Street water/ sewer upgrades
- Design of Temple Street water / sewer upgrades.

12.0 Cross Connection Control Program

In May 2006 the City of Parksville developed a draft cross connection control program as is currently working on the implementation of it.

The cross connection program will be implemented in a manner that will address high and severe hazard water use processes first. These include Industrial, Commercial and Institutional (ICI) users. Each ICI user will be assessed as to the potential risk to the water system. An approved backflow device will have to be installed.

All City owner facilities were assessed and appropriate backflow installed. A tracking program called Backflow Prevention Maintenance Software was installed to track devices around the City and produce letters reminding businesses of when testing is due.

City staff remain watchful of potential cross connections in the fields and report problems back to Cross Connection Control Coordinator.

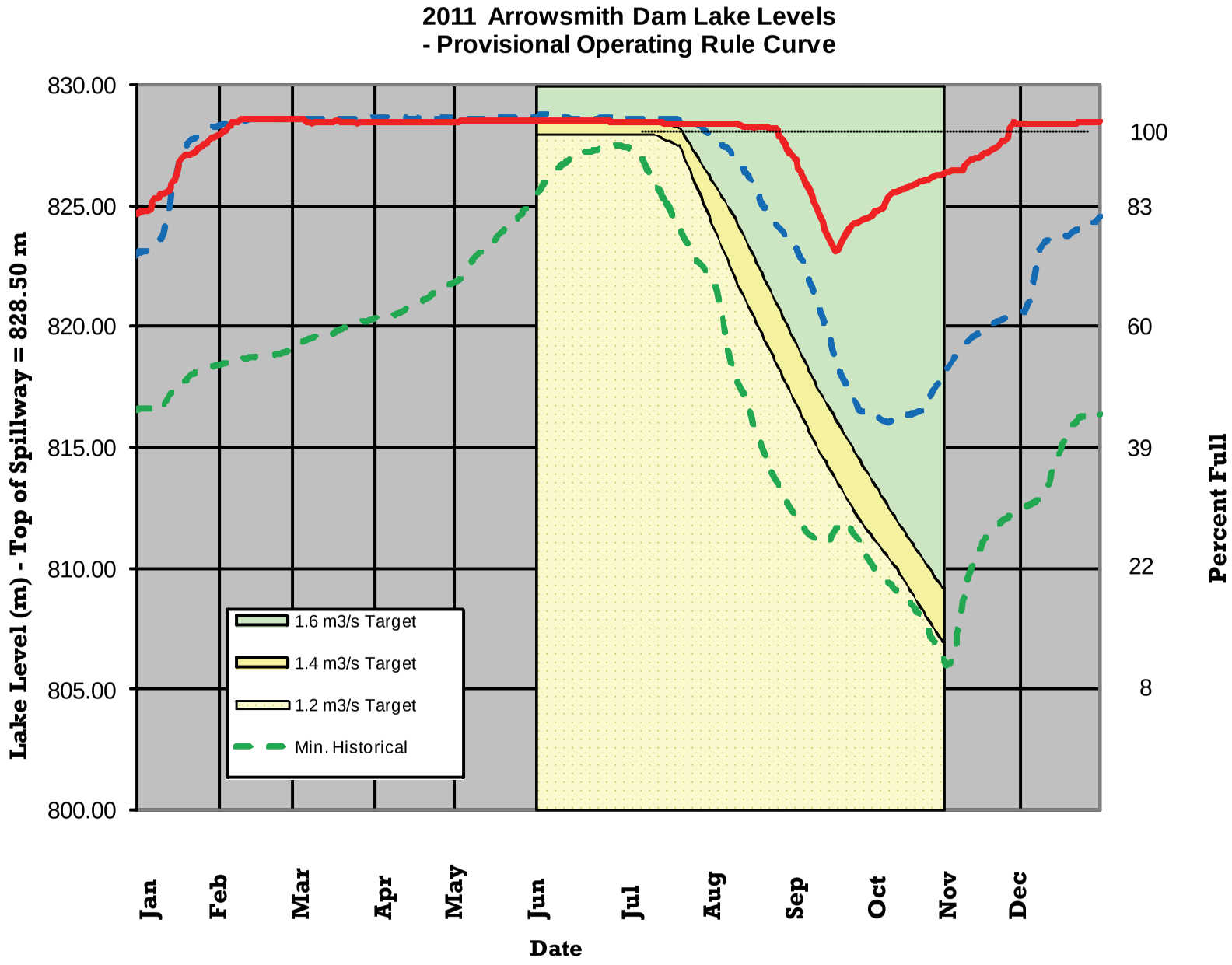
Double Check Valve Assembly

13.0 Emergency Response Plan

The City of Parksville has an Emergency Response Plan pertaining to the water system available for public viewing at the Engineering and Operations Department. This document outlines the strategies to deal with events such as contamination of water supply, pump failures and turbidity events. This plan continues to be updated.

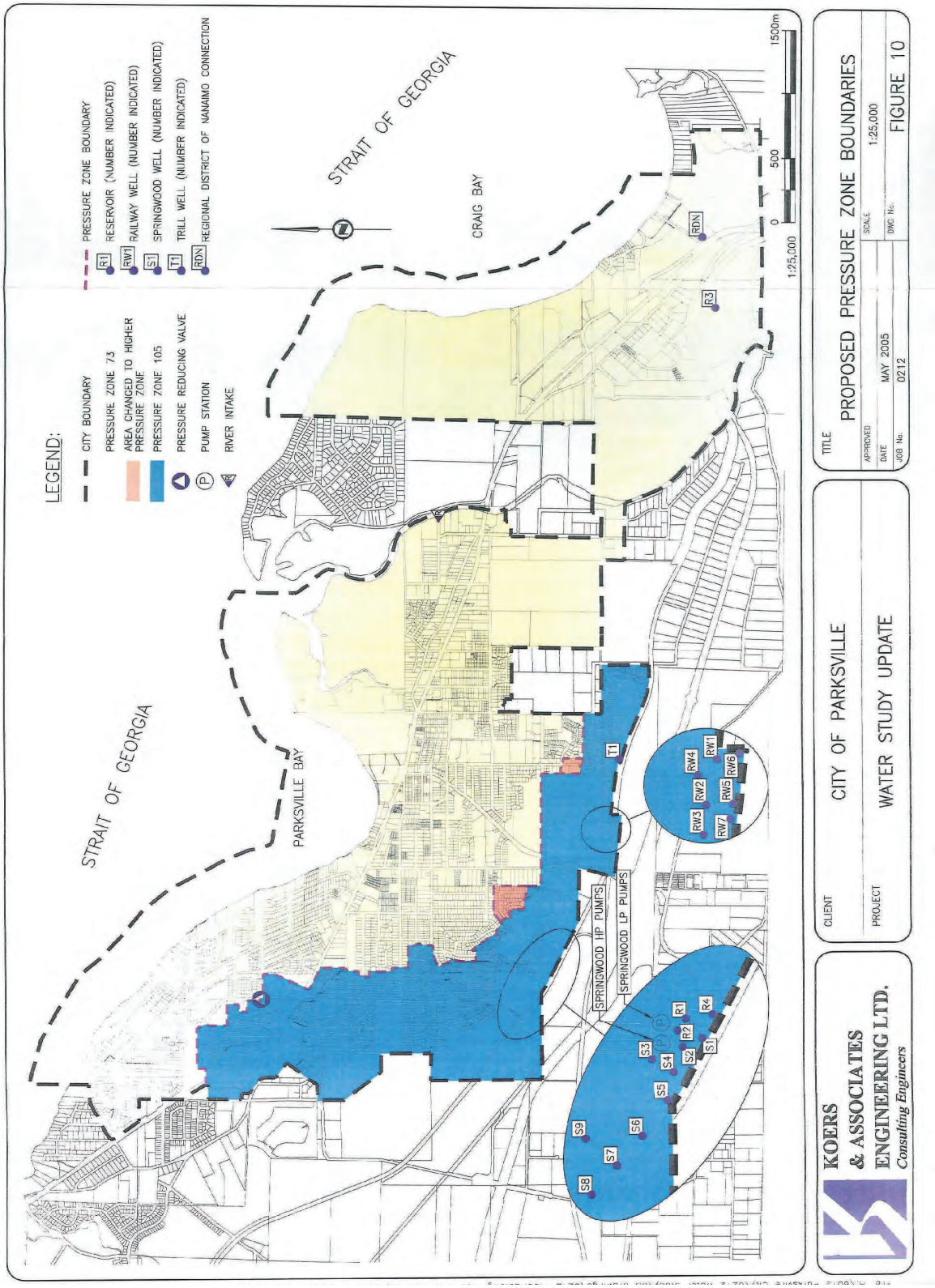
Water Source Locations Map

Arrowsmith Dam Lake Levels 2011



APPENDIX B

Map of Pressure Zone Boundaries



2011 Bacteriological Results

Water Sample Range Report

Vancouver Island Health Authority

Central Island

Facility Name: PARKSVILLE, WWS
Facility Type: DWT
Date Range: Jan 1 2011 to Dec 31 2011
Date Created: Jan 13 2012

Sampling Site	Date Collected	Total Coliform	E. Coli	Fecal Coliform
401 S. Moiliet Street, Parksville BC, Despard & Moilliet, Dist. site, Monthly				
	04-Jan-2011	L1	L1	
	02-Feb-2011	L1	L1	
	22-Mar-2011	L1	L1	
	26-Apr-2011	L1	L1	
	25-May-2011	L1	L1	
	21-Jun-2011	L1	L1	
	20-Jul-2011	L1	L1	
	24-Aug-2011	L1	L1	
	27-Sep-2011	L1	L1	
	25-Oct-2011	L1	L1	
	29-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
Harbour Homes, Parksville BC, Top of Corfield, Parksville , Dist. site, Monthly				
	18-Jan-2011	L1	L1	
	22-Feb-2011	L1	L1	
	09-Mar-2011	L1	L1	
	13-Apr-2011	L1	L1	
	25-May-2011	L1	L1	
	15-Jun-2011	L1	L1	
	26-Jul-2011	L1	L1	
	24-Aug-2011	L1	L1	
	27-Sep-2011	L1	L1	
	25-Oct-2011	L1	L1	
	22-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
1247 Arbutus Road, Parksville BC, Parksville				

2011 Bacteriological Results

MHP/Utility Building, Parksville, Dist. site, Monthly				
	11-Jan-2011	L1	L1	
	15-Feb-2011	L1	L1	
	01-Mar-2011	L1	L1	
	05-Apr-2011	L1	L1	
	03-May-2011	L1	L1	
	07-Jun-2011	L1	L1	
	05-Jul-2011	L1	L1	
	02-Aug-2011	L1	L1	
	06-Sep-2011	L1	L1	
	04-Oct-2011	L1	L1	
	01-Nov-2011	L1	L1	
	06-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
330 Park View, Parksville BC, 330 Park View, Parksville, Dist. site, Monthly				
	25-Jan-2011	L1	L1	
	08-Feb-2011	L1	L1	
	09-Mar-2011	L1	L1	
	13-Apr-2011	L1	L1	
	03-May-2011	L1	L1	
	07-Jun-2011	L1	L1	
	05-Jul-2011	EST 520	L1	
	12-Jul-2011	L1	L1	
	02-Aug-2011	L1	L1	
	06-Sep-2011	L1	L1	
	04-Oct-2011	L1	L1	
	01-Nov-2011	L1	L1	
	06-Dec-2011	L1	L1	
	Total Positive:	**1**	**0**	**0**
1390 Herring Gull Way, Parksville BC, Works Yard, Parksville, Dist. site, Monthly				
	04-Jan-2011	L1	L1	
	02-Feb-2011	L1	L1	
	09-Mar-2011	L1	L1	
	13-Apr-2011	L1	L1	
	11-May-2011	L1	L1	
	21-Jun-2011	L1	L1	
	12-Jul-2011	L1	L1	
	09-Aug-2011	L1	L1	
	13-Sep-2011	L1	L1	
	11-Oct-2011	L1	L1	
	08-Nov-2011	L1	L1	

2011 Bacteriological Results

	14-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
613 Chinook Avenue, Parksville BC, 613 Chinook Avenue, Parksville , Dist. site, Monthly				
	25-Jan-2011	L1	L1	
	15-Feb-2011	L1	L1	
	16-Mar-2011	L1	L1	
	19-Apr-2011	L1	L1	
	11-May-2011	L1	L1	
	07-Jun-2011	L1	L1	
	05-Jul-2011	L1	L1	
	02-Aug-2011	L1	L1	
	06-Sep-2011	L1	L1	
	04-Oct-2011	L1	L1	
	01-Nov-2011	L1	L1	
	06-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
193 East Island Highway, Parksville BC, Community Park, Parksville BC, Dist. site, Monthly				
	04-Jan-2011	L1	L1	
	02-Feb-2011	L1	L1	
	01-Mar-2011	L1	L1	
	05-Apr-2011	L1	L1	
	25-May-2011	L1	L1	
	21-Jun-2011	L1	L1	
	12-Jul-2011	L1	L1	
	09-Aug-2011	L1	L1	
	13-Sep-2011	L1	L1	
	11-Oct-2011	L1	L1	
	08-Nov-2011	L1	L1	
	14-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
Daffodil at Camas, Parksville BC, Daffodil at Camas, Parksville, Dist. site, Monthly				
	11-Jan-2011	L1	L1	
	15-Feb-2011	L1	L1	
	01-Mar-2011	L1	L1	
	05-Apr-2011	L1	L1	
	17-May-2011	L1	L1	
	29-Jun-2011	L1	L1	

2011 Bacteriological Results

	12-Jul-2011	L1	L1	
	09-Aug-2011	L1	L1	
	13-Sep-2011	L1	L1	
	11-Oct-2011	L1	L1	
	08-Nov-2011	L1	L1	
	14-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
271 Chestnut Street, Parksville BC, 271 Chestnut Street, Parksville, Dist. site, Monthly				
	18-Jan-2011	L1	L1	
	08-Feb-2011	L1	L1	
	16-Mar-2011	L1	L1	
	26-Apr-2011	L1	L1	
	31-May-2011	L1	L1	
	15-Jun-2011	L1	L1	
	26-Jul-2011	L1	L1	
	16-Aug-2011	L1	L1	
	21-Sep-2011	L1	L1	
	19-Oct-2011	L1	L1	
	15-Nov-2011	L1	L1	
	14-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
851 Temple, 851 TEMPLE (beside), Dist. site, Monthly				
	11-Jan-2011	L1	L1	
	02-Feb-2011	L1	L1	
	09-Mar-2011	L1	L1	
	13-Apr-2011	L1	L1	
	31-May-2011	L1	L1	
	29-Jun-2011	L1	L1	
	12-Jul-2011	L1	L1	
	09-Aug-2011	L1	L1	
	13-Sep-2011	L1	L1	
	11-Oct-2011	L1	L1	
	08-Nov-2011	L1	L1	
	14-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
378 Kingsley Street, Wheeler, Top of Kingsley, Dist. site, Monthly				
	25-Jan-2011	L1	L1	
	22-Feb-2011	L1	L1	
	29-Mar-2011	L1	L1	
	19-Apr-2011	L1	L1	

2011 Bacteriological Results

	11-May-2011	L1	L1	
	07-Jun-2011	L1	L1	
	05-Jul-2011	L1	L1	
	02-Aug-2011	L1	L1	
	06-Sep-2011	L1	L1	
	04-Oct-2011	L1	L1	
	01-Nov-2011	L1	L1	
	06-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
Englishman River Intake, River Pump Station, Dist. site, Monthly				
	11-Jan-2011	L1	L1	
	08-Feb-2011	L1	L1	
	16-Mar-2011	L1	L1	
	19-Apr-2011	L1	L1	
	17-May-2011	L1	L1	
	29-Jun-2011	L1	L1	
	20-Jul-2011	L1	L1	
	16-Aug-2011	L1	L1	
	21-Sep-2011	L1	L1	
	19-Oct-2011	L1	L1	
	15-Nov-2011	3.1	L1	
	14-Dec-2011	L1	L1	
	Total Positive:	**1**	**0**	**0**
450 Wisteria, across from 450 Wisteria, Dist. site, Monthly				
	04-Jan-2011	L1	L1	
	08-Feb-2011	L1	L1	
	01-Mar-2011	L1	L1	
	05-Apr-2011	L1	L1	
	17-May-2011	L1	L1	
	15-Jun-2011	L1	L1	
	26-Jul-2011	L1	L1	
	16-Aug-2011	L1	L1	
	21-Sep-2011	L1	L1	
	19-Oct-2011	L1	L1	
	15-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
, 136 Memorial, Dist. site, Monthly				
	25-Jan-2011	L1	L1	
	22-Feb-2011	L1	L1	
	29-Mar-2011	L1	L1	
	19-Apr-2011	L1	L1	
	31-May-2011	L1	L1	

2011 Bacteriological Results

Water Sample Range Report for PARKSVILLE, WWS

	29-Jun-2011	L1	L1	
	26-Jul-2011	L1	L1	
	24-Aug-2011	L1	L1	
	27-Sep-2011	L1	L1	
	25-Oct-2011	L1	L1	
	22-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
Island Highway, by Temple, Island Highway, by Temple, Dist. site, Monthly				
	18-Jan-2011	L1	L1	
	15-Feb-2011	L1	L1	
	22-Mar-2011	L1	L1	
	26-Apr-2011	L1	L1	
	25-May-2011	L1	L1	
	21-Jun-2011	L1	L1	
	20-Jul-2011	L1	L1	
	24-Aug-2011	L1	L1	
	27-Sep-2011	L1	L1	
	25-Oct-2011	L1	L1	
	29-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**
770 Soriel, 770 Soriel , Dist. site, Monthly				
	03-May-2011	L1	L1	
	15-Jun-2011	L1	L1	
	20-Jul-2011	L1	L1	
	16-Aug-2011	L1	L1	
	21-Sep-2011	L1	L1	
	19-Oct-2011	L1	L1	
	15-Nov-2011	L1	L1	
	20-Dec-2011	L1	L1	
	Total Positive:	**0**	**0**	**0**

Result Values: **E - estimated** **L - less than** **G - greater than**

2011 Bacteriological Results

Water Sample Range Report for PARKSVILLE, WWS

Samples that contain total coliform:	2	1.06% of total
Samples that contain e. coli:	0	0.00% of total
Samples that contain fecal coliform:	0	0.00% of total
Number of positive samples in last 30 days:	0/16	
Total number of samples:	189	

Comments:

Environmental Health Officer
Jan 13 2012

FOR FURTHER INFORMATION PLEASE CALL: Wrathall, Bill (250) 947-8222 Parksville

Operator

City of Parksville
1116 Herring Gull Way
Parksville, BC
V9P 2H3

(250) 248-5412

Full Spectrum Analysis –Well Water

Maxxam

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Your P.O. #: 00188
Your C.O.C. #: 18000201, 1800020101

Attention: Scott Churko
City of Parksville
Engineering and Operations Dpt
PO Box 1390
Parksville, BC
Canada V9P 2H3

Report Date: 2011/10/19

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B194469
Received: 2011/10/04, 09:00

Sample Matrix: Water
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	1	2011/10/04	2011/10/05	BBY6SOP-00026, BBY0SOP-00002	SM2320B
Chloride by Automated Colourimetry	1	N/A	2011/10/05	BBY6SOP-00011	SM-4500-Cl-
Colour (True)	1	N/A	2011/10/05	BBY6SOP-00021	SM-2120B
Total Coliforms & E.coli Potable W- MF	1	N/A	2011/10/04	BRN SOP 00363 R2.0	Based on SM-9222
Conductance - water	1	N/A	2011/10/05	BBY6SOP-00026	SM-2510B
Fluoride	1	N/A	2011/10/05	BBY6SOP-00038	SM - 4500 F C
Hardness Total (calculated as CaCO3)	1	N/A	2011/10/19		
Na, K, Ca, Mg, S by CRC ICPMS (total)	1	N/A	2011/10/19	BBY7SOP-00002	EPA 200.8
Elements by CRC ICPMS (total)	1	N/A	2011/10/18	BBY7SOP-00002	EPA 200.8
Nitrate + Nitrite (N)	1	N/A	2011/10/05	BBY6SOP-00010	USEPA 353.2
Nitrite (N) by CFA	1	N/A	2011/10/05	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	1	N/A	2011/10/07	BBY6SOP-00010	Based on EPA 353.2
pH Water	1	N/A	2011/10/05	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	1	N/A	2011/10/05	BBY6SOP-00017	SM4500-SO42
Total Dissolved Solids (Filt. Residue)	1	2011/10/07	2011/10/07	BBY6SOP-00033	SM 2540C
Turbidity	1	N/A	2011/10/05	BBY6SOP-00027	SM - 2130B

* Results relate only to the items tested.

Encryption Key

Maxxam
19 Oct 2011 12:24:17 -07:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

RAOUL JAIN, BBY Customer Service
Email: RJain@maxxam.ca
Phone# (604) 639-2618

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Maxxam

Success Throu

Maxxam Job #: B194469
Report Date: 2011/10/19

City of Parksville

Your P.O. #: 00188

DRINKING WATER PACKAGE (WATER)

Maxxam ID		BS3362		
Sampling Date		2011/10/03 09:00		
	Units	NEW INTAKE	RDL	QC Batch
ANIONS				
Nitrite (N)	mg/L	<0.005	0.005	5240664
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	26.4	0.5	5233239
Nitrate (N)	mg/L	<0.02	0.02	5233744
Misc. Inorganics				
Fluoride (F)	mg/L	0.02	0.01	5237823
Alkalinity (Total as CaCO3)	mg/L	23	0.5	5237455
Alkalinity (PP as CaCO3)	mg/L	<0.5	0.5	5237455
Bicarbonate (HCO3)	mg/L	28	0.5	5237455
Carbonate (CO3)	mg/L	<0.5	0.5	5237455
Hydroxide (OH)	mg/L	<0.5	0.5	5237455
Anions				
Dissolved Sulphate (SO4)	mg/L	<0.5	0.5	5242566
Dissolved Chloride (Cl)	mg/L	8.9	0.5	5242404
MISCELLANEOUS				
True Colour	Col. Unit	5	5	5240295
Nutrients				
Nitrate plus Nitrite (N)	mg/L	<0.02	0.02	5240545
Physical Properties				
Conductivity	uS/cm	76	1	5237475
pH	pH Units	7.41		5237476
Physical Properties				
Total Dissolved Solids	mg/L	58	10	5252318
Turbidity	NTU	0.5	0.1	5238357

RDL = Reportable Detection Limit

Maxxam

Success Through Sc

Maxxam Job #: B194469
Report Date: 2011/10/19

City of Parksville

Your P.O. #: 00188

DRINKING WATER PACKAGE (WATER)

Maxxam ID		BS3362		
Sampling Date		2011/10/03 09:00		
	Units	NEW INTAKE	RDL	QC Batch
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	34	3	5274082
Total Antimony (Sb)	ug/L	<0.5	0.5	5274082
Total Arsenic (As)	ug/L	0.1	0.1	5274082
Total Barium (Ba)	ug/L	6	1	5274082
Total Boron (B)	ug/L	<50	50	5274082
Total Cadmium (Cd)	ug/L	<0.01	0.01	5274082
Total Chromium (Cr)	ug/L	<1	1	5274082
Total Cobalt (Co)	ug/L	<0.5	0.5	5274082
Total Copper (Cu)	ug/L	0.7	0.2	5274082
Total Iron (Fe)	ug/L	77	5	5274082
Total Lead (Pb)	ug/L	<0.2	0.2	5274082
Total Manganese (Mn)	ug/L	6	1	5274082
Total Mercury (Hg)	ug/L	<0.05	0.05	5274082
Total Molybdenum (Mo)	ug/L	<1	1	5274082
Total Nickel (Ni)	ug/L	<1	1	5274082
Total Selenium (Se)	ug/L	<0.1	0.1	5274082
Total Silver (Ag)	ug/L	<0.02	0.02	5274082
Total Uranium (U)	ug/L	<0.1	0.1	5274082
Total Vanadium (V)	ug/L	<5	5	5274082
Total Zinc (Zn)	ug/L	<5	5	5274082
Total Calcium (Ca)	mg/L	8.72	0.05	5234536
Total Magnesium (Mg)	mg/L	1.11	0.05	5234536
Total Potassium (K)	mg/L	0.14	0.05	5234536
Total Sodium (Na)	mg/L	3.82	0.05	5234536
Total Sulphur (S)	mg/L	<3	3	5234536
Microbiological Param.				
E. coli	CFU/100mL	14	1	5234820
Total Coliforms	CFU/100mL	180	1	5234820

RDL = Reportable Detection Limit

Full Spectrum Analysis—Raw River Water

Maxxam

Success Through Science®

Your P.O. #: 000292
Your C.O.C. #: 21621704, 2162170401

Attention: Scott Churko
City of Parksville
Engineering and Operations Dpt
PO Box 1390
Parksville, BC
Canada V9P 2H3

Report Date: 2011/12/01

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B1B3663
Received: 2011/11/23, 08:25

Sample Matrix: DRINKING WATER
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	3	2011/11/23	2011/11/23	BBY6SOP-00026, BBY0SOP-00002	SM2320B
Alkalinity - Water	1	2011/11/23	2011/11/24	BBY6SOP-00026, BBY0SOP-00002	SM2320B
Chloride by Automated Colourimetry	4	N/A	2011/11/25	BBY6SOP-00011	SM-4500-Cl-
Colour (True)	4	N/A	2011/11/23	BBY6SOP-00021	SM-2120B
Conductance - water	3	N/A	2011/11/23	BBY6SOP-00026	SM-2510B
Conductance - water	1	N/A	2011/11/24	BBY6SOP-00026	SM-2510B
Fluoride	4	N/A	2011/11/28	BBY6SOP-00038	SM - 4500 F C
Hardness Total (calculated as CaCO3)	4	N/A	2011/12/01		
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2011/12/01	BBY7SOP-00002	EPA 200.8
Elements by CRC ICPMS (total)	4	N/A	2011/11/30	BBY7SOP-00002	EPA 200.8
Nitrate + Nitrite (N)	4	N/A	2011/11/24	BBY6SOP-00010	USEPA 353.2
Nitrite (N) by CFA	4	N/A	2011/11/24	BBY6SOP-00010	EPA 353.2
Nitrogen - Nitrate (as N)	4	N/A	2011/11/25	BBY6SOP-00010	Based on EPA 353.2
pH Water	3	N/A	2011/11/23	BBY6SOP-00026	SM-4500H+B
pH Water	1	N/A	2011/11/24	BBY6SOP-00026	SM-4500H+B
Sulphate by Automated Colourimetry	4	N/A	2011/11/25	BBY6SOP-00017	SM4500-SO42
Total Dissolved Solids (Filt. Residue)	4	2011/11/24	2011/11/24	BBY6SOP-00033	SM 2540C
Turbidity	4	N/A	2011/11/23	BBY6SOP-00027	SM - 2130B

* Results relate only to the items tested.

Encryption Key

Maxxam
01 Dec 2011 12:11:38 -08:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

RAOUL JAIN, BBY Customer Service
Email: RJain@maxxam.ca
Phone# (604) 639-2618

Maxxam

Success Through Sci

Maxxam Job #: B1B3663
Report Date: 2011/12/01

City of Parksville

Your P.O. #: 000292

DRINKING WATER PACKAGE (DRINKING WATER)

Maxxam ID		CE7781	CE7782	CE7783	CE7784		
Sampling Date		2011/11/21 09:10	2011/11/21 09:00	2011/11/21 09:35	2011/11/21 09:25		
	Units	**SPRINGWOOD WELL #5**	**SPRINGWOOD WELL #6**	**RAILWAY WELL #3**	**RAILWAY WELL #5**	**RDL**	**QC Batch**
ANIONS							
Nitrite (N)	mg/L	0.008	<0.005	<0.005	<0.005	0.005	5392288
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	127	152	115	167	0.50	5387217
Nitrate (N)	mg/L	0.719	1.37	0.739	1.24	0.020	5387838
Misc. Inorganics							
Fluoride (F)	mg/L	0.037	0.036	0.044	0.047	0.010	5399957
Alkalinity (Total as CaCO3)	mg/L	128	137	88.7	126	0.50	5388623
Alkalinity (PP as CaCO3)	mg/L	<0.50	<0.50	<0.50	<0.50	0.50	5388623
Bicarbonate (HCO3)	mg/L	156	167	108	153	0.50	5388623
Carbonate (CO3)	mg/L	<0.50	<0.50	<0.50	<0.50	0.50	5388623
Hydroxide (OH)	mg/L	<0.50	<0.50	<0.50	<0.50	0.50	5388623
Anions							
Dissolved Sulphate (SO4)	mg/L	4.80	9.16	5.00	7.40	0.50	5394978
Dissolved Chloride (Cl)	mg/L	19	16	33	43	0.5	5394916
MISCELLANEOUS							
True Colour	Col. Unit	<5	<5	<5	<5	5	5389118
Nutrients							
Nitrate plus Nitrite (N)	mg/L	0.727	1.37	0.739	1.24	0.020	5392286
Physical Properties							
Conductivity	uS/cm	303	330	284	382	1.0	5388627
pH	pH Units	7.90	7.59	7.86	7.90		5388629
Physical Properties							
Total Dissolved Solids	mg/L	160	172	152	200	10	5390912
Turbidity	NTU	2.12	<0.10	0.32	<0.10	0.10	5386680

RDL = Reportable Detection Limit

Maxxam

Success Through Scier

Maxxam Job #: B1B3663
Report Date: 2011/12/01

City of Parksville

Your P.O. #: 000292

DRINKING WATER PACKAGE (DRINKING WATER)

Maxxam ID		CE7781	CE7782	CE7783	CE7784		
Sampling Date		2011/11/21 09:10	2011/11/21 09:00	2011/11/21 09:35	2011/11/21 09:25		
	Units	SPRINGWOOD WELL #5	SPRINGWOOD WELL #6	RAILWAY WELL #3	RAILWAY WELL #5	RDL	QC Batch
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	<3.0	<3.0	<3.0	<3.0	3.0	5408486
Total Antimony (Sb)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5408486
Total Arsenic (As)	ug/L	0.23	0.29	0.23	0.38	0.10	5408486
Total Barium (Ba)	ug/L	6.0	6.2	5.6	22.7	1.0	5408486
Total Boron (B)	ug/L	<50	<50	<50	<50	50	5408486
Total Cadmium (Cd)	ug/L	<0.010	<0.010	<0.010	<0.010	0.010	5408486
Total Chromium (Cr)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5408486
Total Cobalt (Co)	ug/L	<0.50	<0.50	<0.50	<0.50	0.50	5408486
Total Copper (Cu)	ug/L	0.85	0.54	6.87	4.93	0.20	5408486
Total Iron (Fe)	ug/L	173	13.5	106	59.3	5.0	5408486
Total Lead (Pb)	ug/L	<0.20	<0.20	0.23	1.82	0.20	5408486
Total Manganese (Mn)	ug/L	17.4	7.6	13.1	7.0	1.0	5408486
Total Mercury (Hg)	ug/L	<0.050	<0.050	<0.050	<0.050	0.050	5408486
Total Molybdenum (Mo)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5408486
Total Nickel (Ni)	ug/L	<1.0	<1.0	<1.0	<1.0	1.0	5408486
Total Selenium (Se)	ug/L	<0.10	<0.10	<0.10	0.24	0.10	5408486
Total Silver (Ag)	ug/L	<0.020	<0.020	<0.020	<0.020	0.020	5408486
Total Uranium (U)	ug/L	0.14	0.21	0.12	0.34	0.10	5408486
Total Vanadium (V)	ug/L	<5.0	<5.0	<5.0	<5.0	5.0	5408486
Total Zinc (Zn)	ug/L	15.5	<5.0	6.5	<5.0	5.0	5408486
Total Calcium (Ca)	mg/L	28.7	34.6	25.6	38.3	0.050	5388096
Total Magnesium (Mg)	mg/L	13.5	15.9	12.5	17.3	0.050	5388096
Total Potassium (K)	mg/L	0.808	0.874	0.678	0.924	0.050	5388096
Total Sodium (Na)	mg/L	9.09	9.61	6.06	11.3	0.050	5388096
Total Sulphur (S)	mg/L	<3.0	<3.0	<3.0	<3.0	3.0	5388096

RDL = Reportable Detection Limit

Full Spectrum Analysis

APPENDIX E

Water System Operating Conditions

VANCOUVER ISLAND health authority

APPENDIX A

WATER SYSTEM OPERATING CONDITIONS FOR

PARKSVILLE, WWS

1116 Herring Gull Way

Parksville, BC, V9P 2H3

1. Compliance with Operating Permit Terms and Conditions do not relieve the operator of other legislated responsibilities and obligations.

2. Water system operators must be familiar with the relevant legislation such as:
   The *Drinking Water Protection Act* , ([SBC 2001] Chapter 9)
   The *Drinking Water Protection Regulation* (B.C. Reg. 200/2003 O.C. 508/2003.

3. The operator must ensure that the water system is in compliance with any and all lawful direction of the Drinking Water Officer. This includes any correspondence to further explain or alter the above operating terms and conditions. Proposed changes to the operating permit initiated by the Drinking Water Officer will allow an opportunity for input by the water supplier as per section 8 of the Act.

The specific terms and conditions are listed below as:

Condition 1.

The water system owner shall provide a residual level of disinfectant within the water distribution system. It is recommended that the level of residual disinfectant measured at any point within the distribution system be at least 0.20 mg/L, measured as *free* chlorine.

The maximum residual disinfectant concentration, measure as *free* chlorine shall not exceed 4.0 mg/L, or as combined chlorine shall not exceed 3.0 mg/L, anywhere in the distribution system. This does not apply in situations where watermains are being superchlorinated during their installation, repair or routine maintenance.

Condition 2.

Conduct a chemical analysis of raw water from each well in accordance with the list of parameters specified in the VIHA Guidelines for Approval of a Waterworks System at a frequency of no less than once every **5 years.**

Health Protection and Environmental Services

Parksville	(250) 248-2044	Fax: (250) 248-8624	Port Alberni	(250) 724-1281	Fax: (250) 724-4376
Nanaimo	(250) 755-6215	Fax: (250) 755-3372	Courtenay	(250) 334-5450	Fax: (250) 334-5466

Our Vision: Healthy People, Healthy Island Communities, Seamless Service

Water System Operating Conditions

Condition 3.

Develop and implement a wellhead protection plan to ensure that the drinking water source is protected in to the future. The wellhead protection plan should establish management strategies to avoid contamination of, or activities, which may degrade the quality of the drinking water source. The details of the wellhead protection plan and timing of the implementation of the program shall be established in consultation with the local Environmental Health Officer.

The wellhead protection plan should be based on the publication "Well Protection Tool Kit", Ministry of Environment, Lands and Parks, Ministry of Health and Ministry of Municipal Affairs; Issued by: Water Stewardship Division. ISBN 0-7726-5566-9.
http://www.env.gov.bc.ca/wsd/plan_protect_sustain/groundwater/wells/well_protection/wellprotect.html

Condition 4.

Develop and implement a Cross-Connection Control Program. The details of the cross-connection program and timing of implementation of the program shall be established in consultation with the local Environmental Health Officer.

Condition 5.

Provide continuous on-line turbidity monitoring of raw water for the Englishman River during drawing periods (May through October as applicable) and ensure the Emergency Response Plan includes appropriate action for turbidity events as detailed in the *"Decision Tree for Responding to a Turbidity Event in Unfiltered Drinking Water"*.

Condition 6.

In accordance with VIHA 4321 treatment policy for the Englishman River water source, provide finished water quality using technology that will achieve the following performance standard; a 4-log removal/inactivation of viruses, a 3-log removal/inactivation of Giardia cysts and Cryptospordium oocysts, provide two treatment processes and produce finished water with less that 1 NTU turbidity.

In consultation with, and in reference to the City of Parksville letter dated February 4, 2009 (Your file 5600-10-AWS), the City of Parksville is required to meet the following implementation plan:

May, 2009: Obtain the services of a professional engineering firm to develop a conceptual plan and preliminary design for a water intake and treatment facility.
November, 2010: Conceptual plan and preliminary design is completed.
December, 2013: Detailed design of the new intake and treatment facility is completed.
January, 2015: Construction for the water intake and treatment facility commences with completion scheduled for December 31, 2016.

Date: April 24, 2009

B. Wrenn