

DECOURCEY

Water Service Area Annual Report 2010

Prepared by:



REGIONAL DISTRICT OF NANAIMO
Water Services Department
June 2011



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1.0 Introduction

The following annual report describes the Decourcey Water Service Area and summarizes the water quality and production data from 2010. 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 2011.

2.0 Decourcey Water Service Area

The Decourcey Water Service Area was established in 1998 in a rural area south of Nanaimo and comprises two properties on Bissel Road and three properties on Pylades Drive. The water source for the Decourcey Water Service Area comes from one groundwater well located nearby. The water supply is stored in one reservoir and is chlorinated manually. A portable generator is available in the event of a power outage. A map of the Decourcey Water Service Area is provided in Appendix A for reference.

2.1 Groundwater Wells

One groundwater production well is present at 3284 Bissel Road, Cedar, B.C.

Well / Name	Well Depth	Wellhead Protection In-Place	Treated/Untreated with Chlorine
#1	61.0 m	Yes	Treated

2.2 Reservoirs

One steel above-ground reservoir is present at 3280 Bissel Road and has a capacity of 136 m³ (30,000 imperial gallons).

2.3 Distribution System

The water distribution system in Decourcey is composed entirely of 150mm PVC watermains (0.7 km). Four fire hydrants are located in the water service area.



Decourcey Water Storage Reservoir

3.0 Water Sampling and Testing Program

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

Timing	Location	Tests
Weekly	RDN (in-house) Laboratory	Total coliforms, E.coli Temperature, pH, Conductivity Chlorine residual, Salinity, TDS
Health Dept. (monthly, or as-required)	BC Centre for Disease Control	Total coliforms, E.Coli
Monthly	North Island Labs	Chloride, Fluoride Total Iron and Manganese
Quarterly	North Island Labs	Tri-halomethanes
Annual Source Water Testing	North Island Labs	Complete potability testing of raw well water (every Fall)
Annual System Water Testing	North Island Labs	Complete potability testing of distribution system (every Spring)

4.0 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 Environmental/Water section, under “Water Service Areas” then “WaterSmart 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.

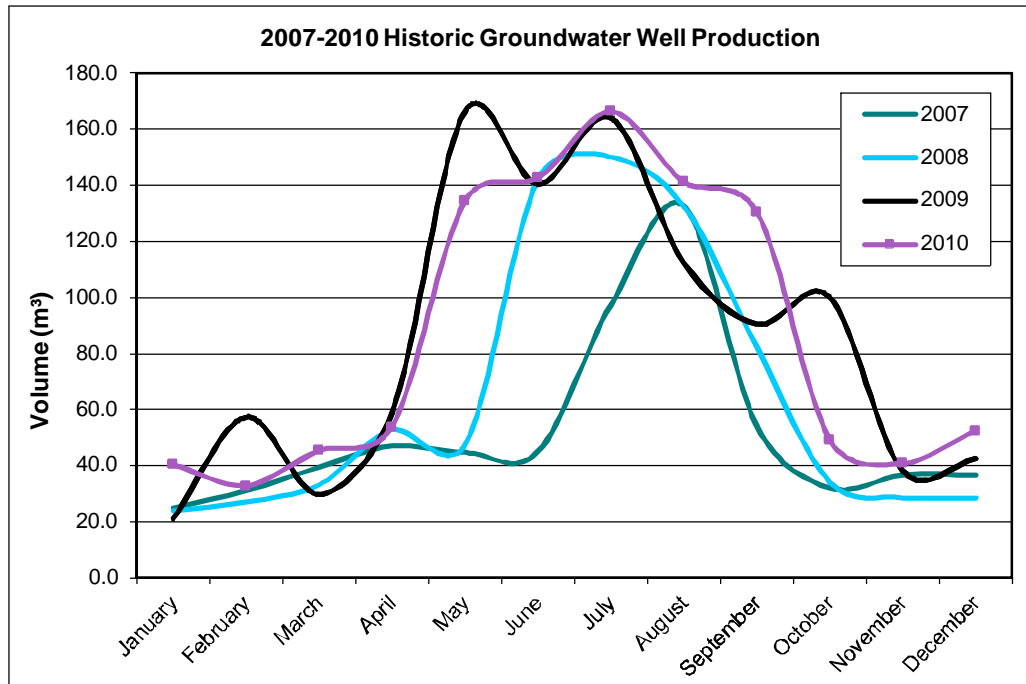
The Conductivity and Chloride levels in the Decourcey water system are generally increasing year to year. In 2011, a letter will be sent to all water system users encouraging year-round water conservation in order to reduce or reverse the potential for saltwater intrusion.

5.0 Water Quality Inquiries and Complaints

Very few complaints and inquiries were received from the Decourcey water service area, and were typically related to power outages.

6.0 Groundwater Production and Consumption

The monthly groundwater production in the Decourcey system for the past 4 years is shown in the chart below. Groundwater production in 2010 was average in comparison to previous years.



Consumption

In the Fall/Winter of 2010, the average usage per home in Decourcey was 0.45 cubic metres per day (99 imperial gallons). In the summer, the average water usage was 0.93 cubic metres per day (205 imperial gallons). Based on these figures, the annual consumption per capita is estimated to be 230 L/day (based on 2.4 people/household). This consumption is 25% less than the RDN system average of 305 L/day/capita for 2010.

7.0 Maintenance Program

A weekly pump station inspection is carried out to reduce or eliminate the risk of contamination and system failure, and to ensure the consistent application of chlorine for treatment purposes. Water mains are flushed once annually in the Spring. Fire hydrants are serviced once per year (either 'A-level' or 'B-level' maintenance) in the Fall.

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

8.0 Water Service Area Projects

8.1 2010 Completed Studies & Projects

- Updated the outdoor sprinkling regulations;
- Completed annual B-service fire hydrant maintenance;
- Prepared a Draft Cross Connection Control Bylaw;
- Carried out a comprehensive water conservation campaign (Team WaterSmart);
- Updated and improved the RDN website at www.rdn.bc.ca;
- Updated the Emergency Response Plan;
- Utilized the Auto E-message service to notify member residents of water service disruptions and upcoming maintenance activities;
- Applied the low-flush toilet incentive;
- Maintained a high level of water quality;
- Maintained excellent customer complaint and service request response times;
- Continued quality control through regular testing and monitoring of our water systems; and,
- Completed additional educational programs.

8.2 2011 Proposed Projects & Upgrades

- Send an information letter to Decourcey water system users to encourage conservation;
- Drain and clean the Decourcey water storage reservoir;
- Complete the Cross Connection Control Bylaw, and establish a procedure for reviewing commercial and industrial properties for water system risks.

9.0 Emergency Response Plan

The Regional District Emergency Response Plan (ERP) contains procedures and contact information to efficiently respond to water system emergencies such as contamination of water supply, loss of supply, and pump failure. The ERP was reviewed and updated in 2010, and copies are available on our website, at each RDN office, in each pumphouse, and in each Water Services vehicle. A copy of the ERP is also attached to this report in Appendix C.

10.0 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 Service Areas nearby was undertaken. A database of commercial customers in the Regional District of Nanaimo 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.

In 2010, a Draft Cross Connection Control Bylaw was prepared and is anticipated to be finalized in 2011. Additionally, the program in 2011 will include:

- A formal survey of existing and potential Cross Connections, and
- An audit of RDN-owned facilities in each water service area.

11.0 Closing

An annual report for the year 2011 will be prepared and submitted to the Vancouver Island Health Authority in the Spring of 2012. Annual reports are also available on our website at www.rdn.bc.ca in the Environmental/Water section, under "Water Service Areas" then "WaterSmart Communities".

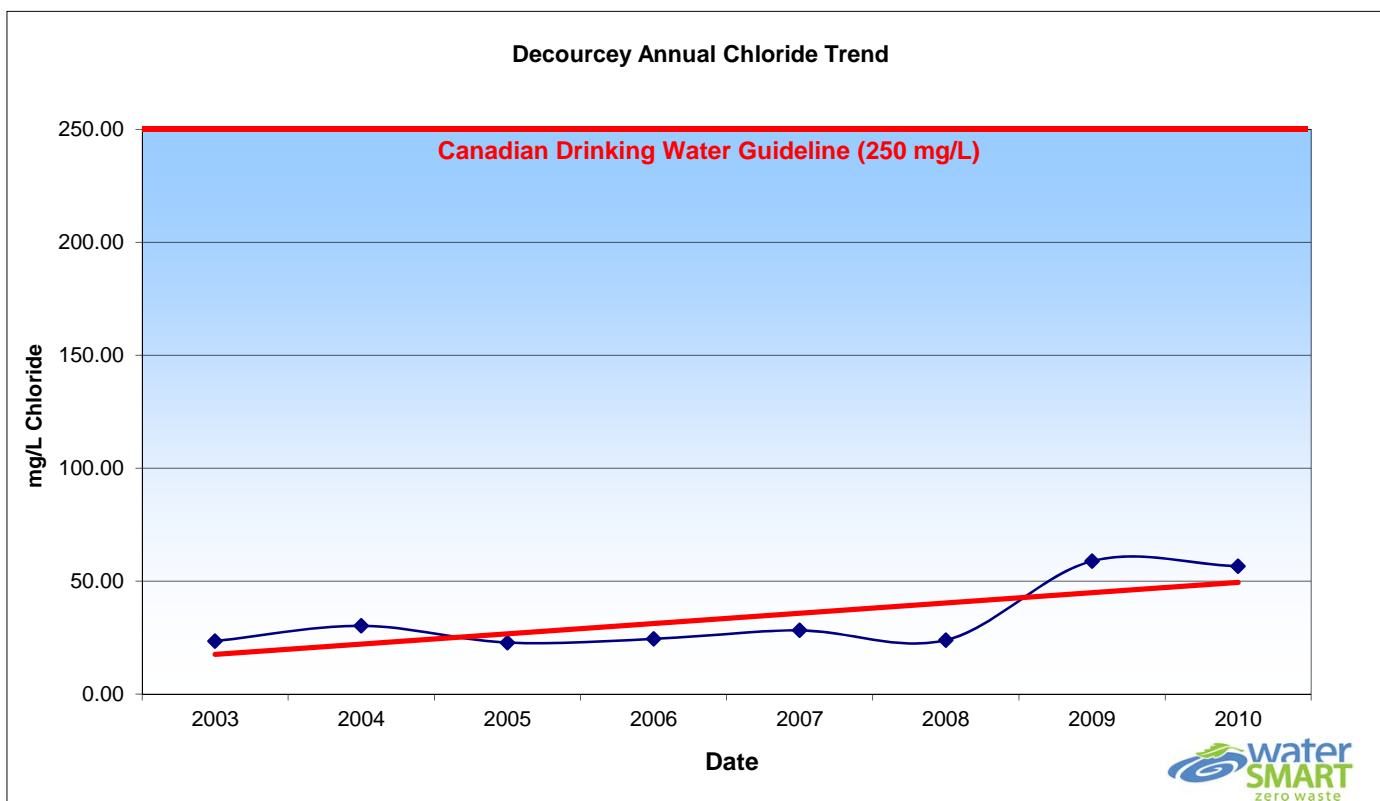
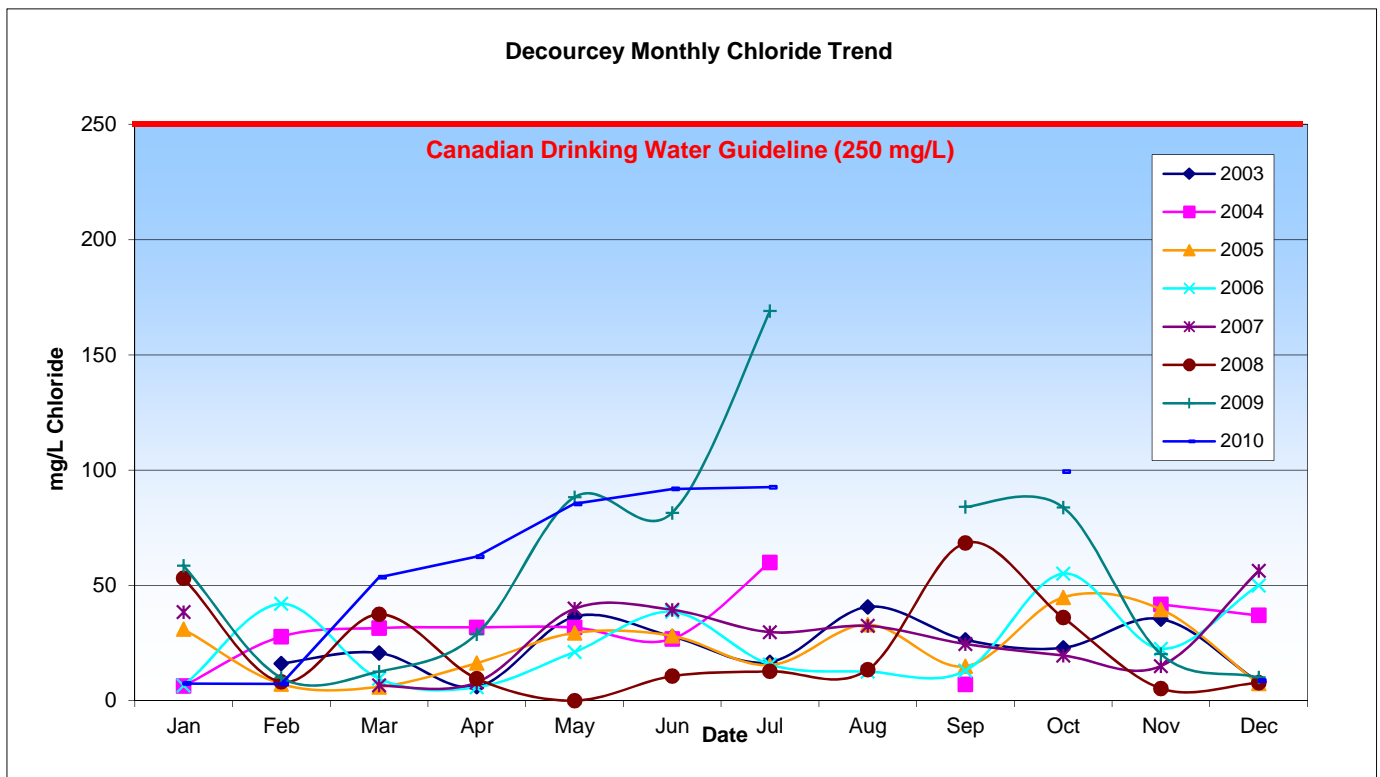
APPENIDX A

**MAP OF DECOURCEY
WATER SERVICE AREA**

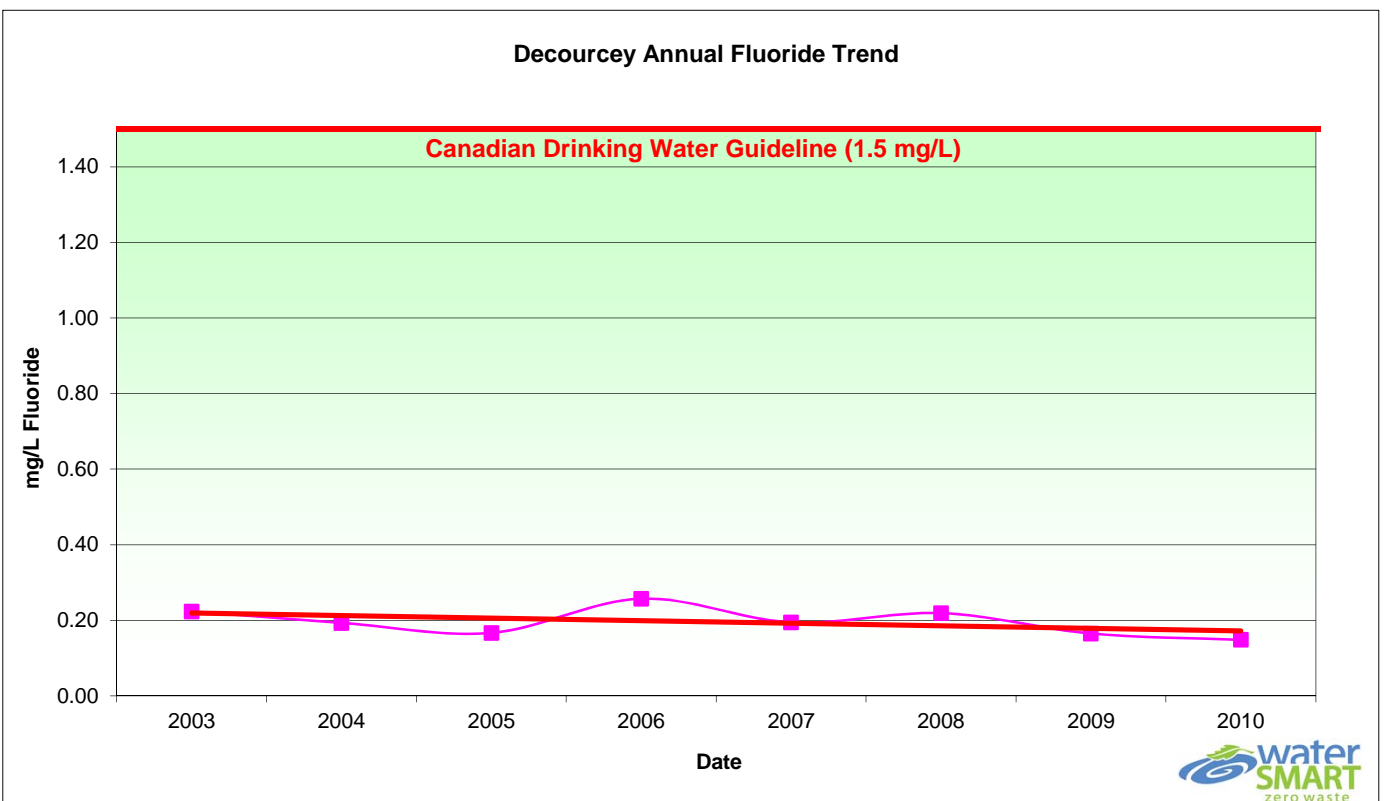
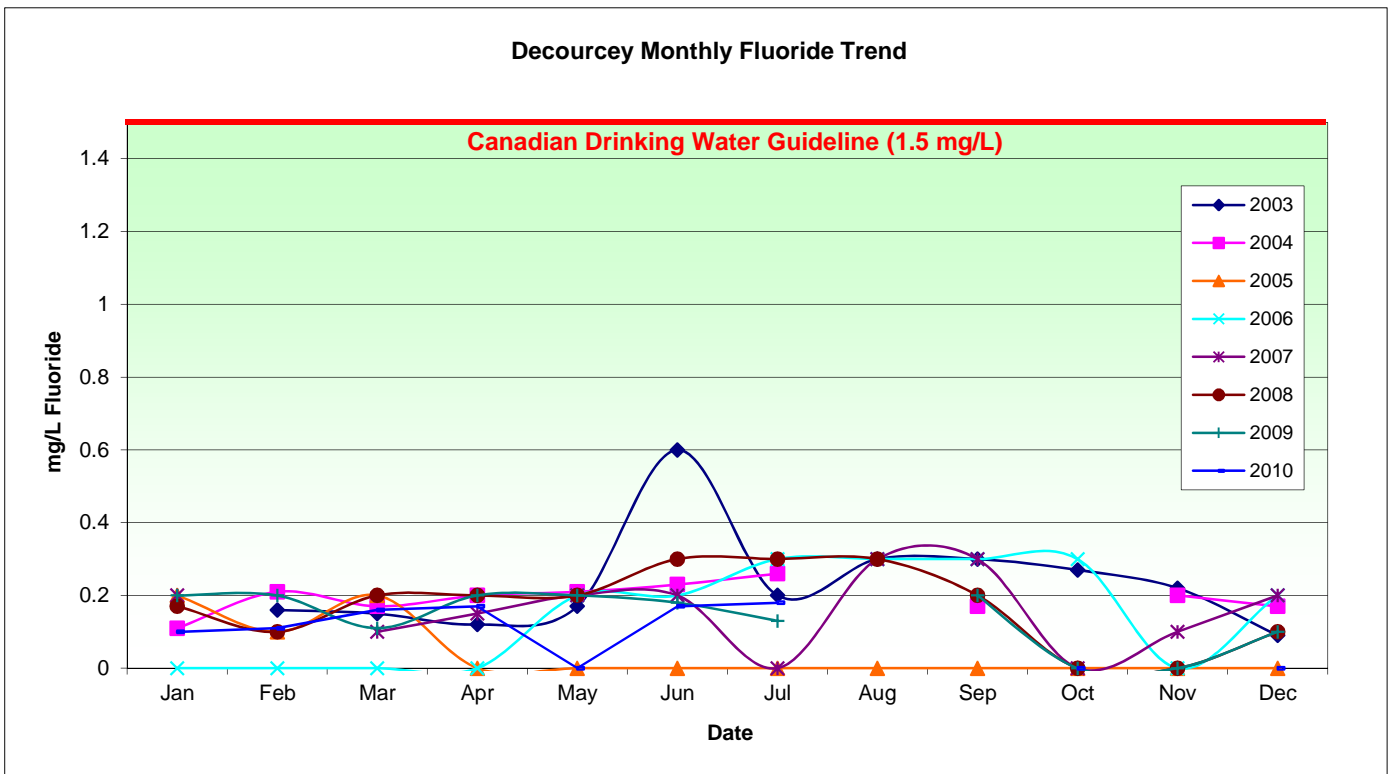
APPENDIX B

WATER QUALITY TESTING RESULTS

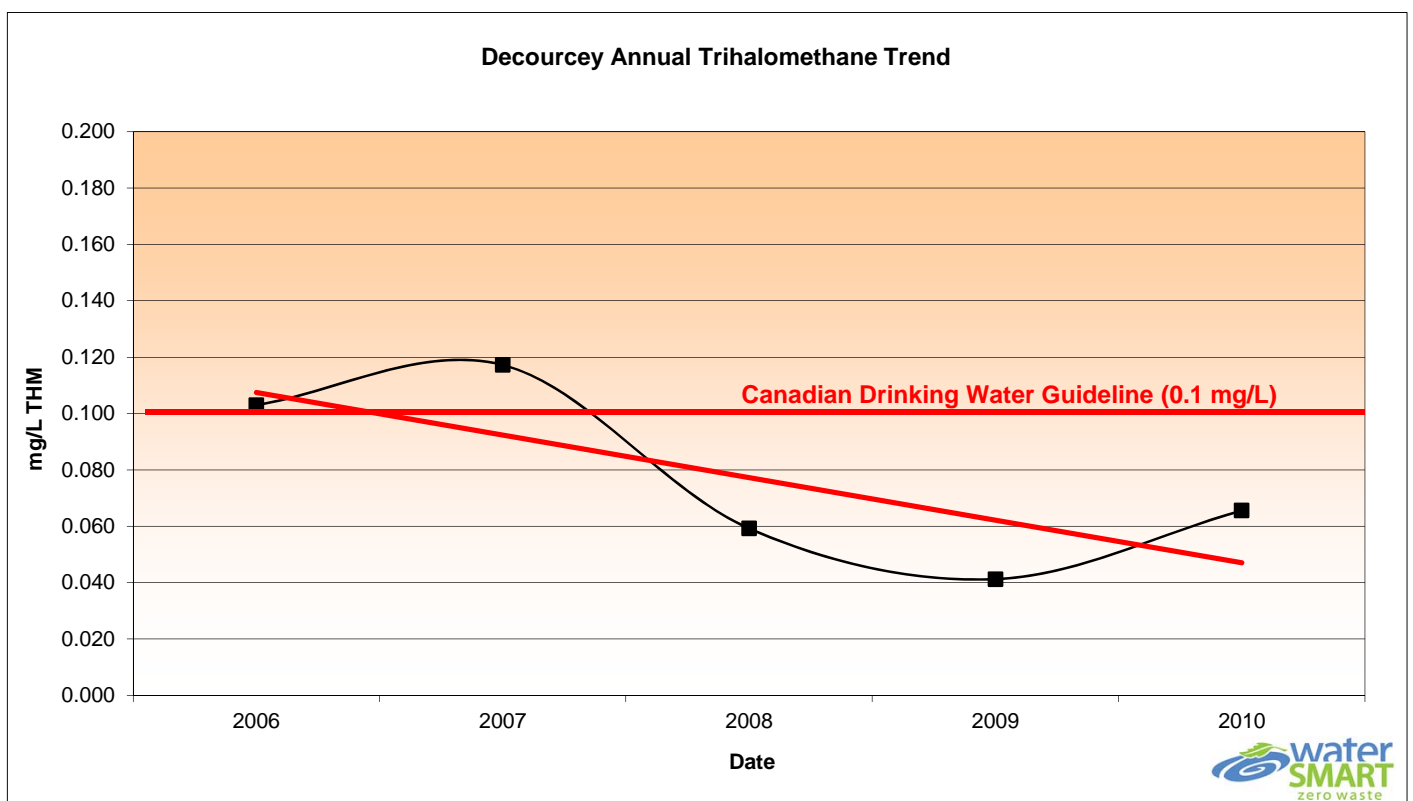
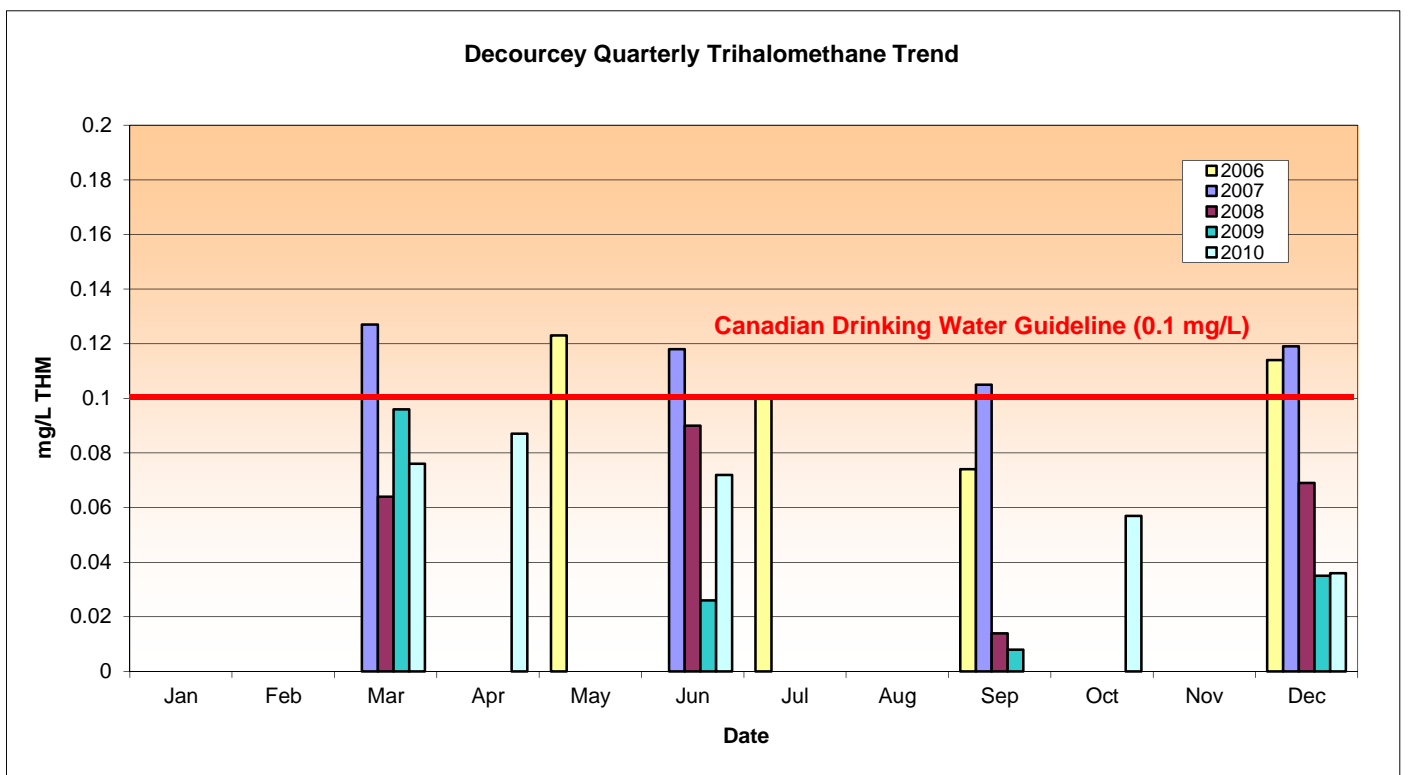
Date	Chloride (mg/L)								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Jan		6.4	31.0	6.5	38.4	53.1	58.5	7.4	
Feb	16.06	27.8	7.2	42.0		8.1	9.9	7.2	
Mar	20.71	31.5	6.0	9.5	6.6	37.5	12.6	53.5	
Apr	6.06	31.8	16.3	5.8	7.9	9.6	28.9	62.5	
May	36.4	31.7	29.4	21.1	39.9	<2.0	88.3	85.4	
Jun	27.8	26.8	28.1	38.5	39.4	10.6	81.5	91.8	
Jul	16.7	60	15.4	15.7	29.7	12.7	169.0	92.6	
Aug	40.7		33.0	12.6	32.4	13.4			
Sep	26.4	7	14.9	13.0	24.6	68.4	84.1		
Oct	22.9		44.8	55.1	19.6	36	83.8	99.4	
Nov	35.4	41.7	39.6	22.5	15.0	5.3	20.2		
Dec	8.2	37	7.4	50	56.3	7.7	10.1	8.7	
Avg	23.39	30.17	22.76	24.36	28.16	23.85	58.81	56.50	



Date	Fluoride (mg/L)								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Jan		0.11	0.2	<1.0	0.2	0.2	0.20	0.1	
Feb	0.16	0.21	0.1	<1.0		0.1	0.20	0.1	
Mar	0.15	0.17	0.2	<1.0	0.1	0.2	0.11	0.2	
Apr	0.12	0.2	<1.0	<1	0.2	0.2	0.20	0.2	
May	0.17	0.21	<0.1	0.2	0.2	0.2	0.20	<1.0	
Jun	0.6	0.23	<1.0	0.2	0.2	0.3	0.18	0.2	
Jul	0.2	0.26	<1.0	0.3	<0.1	0.3	0.13	0.2	
Aug	0.3		<0.1	0.3	0.3	0.3			
Sep	0.3	0.17	<0.1	0.3	0.3	0.2	0.20		
Oct	0.27		<1.0	0.3	<1.0	<1.0	<1.0	<1.0	
Nov	0.22	0.2	<1.0	<1.0	0.1	<0.1	<0.1		
Dec	0.09	0.17	<1.0	0.2	0.2	0.1	0.10	<1.0	
Avg	0.22	0.19	0.17	0.26	0.2	0.2	0.2	0.15	



Date	Trihalomethanes (mg/L)								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Jan									
Feb									
Mar					0.127	0.064	0.096	0.076	
Apr								0.087	
May				0.123					
Jun					0.118	0.09	0.026	0.072	
Jul				0.101					
Aug									
Sep				0.074	0.105	0.014	0.008		
Oct								0.057	
Nov									
Dec				0.114	0.119	0.069	0.035	0.036	
Avg				0.103	0.117	0.059	0.041	0.066	





Decourcey Distribution Water Analysis Results

Location: 2418 Pylades Drive

Canadian Drinking Water Guidelines Package

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

Red font indicates non-compliance with Canadian Drinking Water Guidelines



Parameters	Water Quality Guidelines				1999	2000	2001	06-Mar 2002	23-Apr 2003	2004	20-Apr 2005	17-May 2006	22-May 2007	26-May 2008	11-May 2009	17-May 2010
	Units	CDWG	BCAWQG													
Color	CU	15	</=15	AO				2	3	7	<5	<5	10	<5	<5	<5
Conductivity	uS		700	MAC				521	527	529	543	569	563	584	592	643
TDS	mg/L	500	</=500	AO				267	307	320	310	353	322	338	318	424
Hardness (CaCO3)	mg/L	80-100	</=500	AO				37.5	34.7	36	39	37	40	37	42	40
pH	pH units	6.5-8.5	6.5-8.5	AO				7.49	7.69	7.8	7.7	7.9	7.8	8.03	7.9	7.8
Turbidity	NTU's	5	1	MAC				<.05	0.16	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Alkalinity	mg/L							199	227	200	210	210	200	190	190	190
Chloride	mg/L	250	</=250	AO				33.04	33.4	28.2	35.4	38.6	41.9	47.6	55.8	68.7
Fluoride	mg/L	1.5	1.5	MAC				0.19	0.15	<1	<1.0	1.8	<1	<1.0	<1.0	<1.0
Sulfate	mg/L	500	</=500	AO				28.98	23.6	32.6	20.5	22.3	20.8	19.6	20.3	20.3
Nitrate	mg/L	10	10	MAC				0.03	0.05	<0.1	<0.1	0.04	<0.1	<0.1	0.1	<0.1
Nitrite	mg/L	1						<.006	<0.01	<0.1	<0.1	<0.01	<0.1	<0.1	<0.1	<0.1
T-Aluminum	mg/L		0.2	MAC				<.009	0.011	0.008	0.006	<0.005	<0.005	<0.05	<0.005	0.012
T-Antimony	mg/L		0.006	MAC				<.006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002
T-Arsenic	mg/L	0.025	0.025	IMAC				<.01	0.0003	0.0002	0.0007	0.0004	0.0003	0.002	0.0004	0.0006
T-Barium	mg/L	1.0	1	MAC				0.0126	0.013	0.009	0.02	0.031	0.019	0.02	0.02	0.016
T-Boron	mg/L	5.0	5	MAC				0.019	0.153	0.144	0.14	0.12	0.121	0.1	0.176	0.115
T-Cadmium	mg/L	0.005						<.0006	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.0003	<0.00001	<0.00001
T-Calcium	mg/L							11.7	10.8	11.5	12	11.8	12.4	11.5	13	12.6
T-Chromium	mg/L	0.05	0.05	MAC				<.0009	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.003	<0.0004	<0.0004
T-Copper	mg/L	1.0	</=1	MAC				0.005	0.005	0.005	0.01	0.013	0.013	0.02	0.013	0.008
T-Iron	mg/L	0.3	</=0.3	AO				0.026	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.03	<0.01
T-Lead	mg/L	0.01	0.01	MAC				0.004	0.0004	0.0003	0.0006	0.0006	0.0006	<0.0005	0.0004	0.0002
T-Lithium	mg/L														0.015	0.017
T-Magnesium	mg/L		</=700	AO				2.02	1.9	1.8	2.1	1.9	2.2	2	2.37	2.17
T-Manganese	mg/L	0.05	</=0.05	AO				0.0051	0.006	<0.005	<0.005	<0.005	<0.005	0.006	0.002	0.0031
T-Mercury	mg/L	0.001	0.001	MAC				<.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.01	<0.01	<0.01
T-Nickel	mg/L														<0.001	<0.001
T-Phosphorus	mg/L														<0.01	0.014
T-Potassium	mg/L							0.8	0.5	0.7	0.8	0.6	0.6	0.6	0.7	0.9
T-Selenium	mg/L	0.01	0.01	MAC				<.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.003	0.0008	<0.0006
T-Silver	mg/L														<0.00001	<0.00001
T-Sodium	mg/L	200	</=200	AO				111	114	111	108	6.7	112	126	126	130
T-Uranium	mg/L	0.1	0.1	MAC				<.02	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.002	<0.0004	<0.0004
T-Zinc	mg/L	5	<5	AO				0.0494	0.042	0.071	0.108	0.115	0.116	0.099	0.092	0.069
Total Coliform	cfu/100ml	<1	<1	cfu/100ml				n/a	n/a	<1	<1	<1	<1	<1.0	<1.0	<1.0
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml				n/a	n/a	<1	<1	<1	<1			
E.coli	cfu/100ml	<1	<1	cfu/100ml								<1	<1	<1.0	<1.0	<1.0
Tannins & Lignins								<.1	n/a	n/a	n/a	n/a	n/a			
Trihalomethanes	mg/l	0.1		MAC				n/a	n/a	n/a	n/a	0.123				



Decourcey Raw Water Analysis Results
Canadian Drinking Water Guidelines Package
Decourcey Well: Between 3274 & 3284 Bisell Road



MAC=Maximum Acceptable Concentration IMAC= Interim Maximum Acceptable Concentration AO= Aesthetic Objective
 CDWG= Canadian Drinking Water Guidelines BCAWQG= British Columbia Approved Water Quality Guidelines
Red font indicates non-compliance with Canadian Drinking Water Guidelines

Parameter	Water Quality Guidelines				16-Oct	22-Oct	26-Oct	24-Oct	24-Oct	22-Oct	14-Oct	14-Oct	17-May	25-Oct
	Units	CDWG	BCAWQG		2002	2003	2004	2005	2006	2007	2008	2009	2010	2010
Color	CU	15	<=15	AO	5	10	<5	<5	<5	10	8	7	<5	<5
Conductivity	µS		700	MAC	564	226	408	611	514	433	558	737	710	765
Total Dissolved Solids	mg/L	500	<=500	AO	327	120	220	327	300	270	370	398	426	428
Hardness (CaCO3)	mg/L	80-100	<=500	AO	35.7	82	44	23	13	43	18	49	43	47
pH	pH units	6.5-8.5	6.5-8.5	AO	7.6	6.56	7.3	7.9	8.1	7.38	8.3	7.7	7.5	7.4
Turbidity	NTU's	5	1	MAC	<0.05	0.56	0.6	0.7	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
Alkalinity	mg/L				224	90	200	230	230	170	230	210	200	200
Chloride	mg/L	250	<=250	AO	6	5	8.4	44.8	22.5	19.6	36	83.8	85.4	99.4
Fluoride	mg/L	1.5	1.5	MAC	0.21	<0.6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	500	<=500	AO	29.74	11.5	11.2	20.2	10.6	14.1	13	22.9	22.2	26.2
Nitrate (N)	mg/L	10	10	MAC	<0.01	0.6	0.1	<0.1	<0.1	0.3	<0.1	<0.1	<0.1	<0.1
Nitrite (N)	mg/L	1			<0.01	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
T-Aluminum	mg/L	0.1	0.2	MAC	0.007	0.03	0.031	0.061	0.015	0.013	0.001	<0.005	0.012	<0.005
T-Antimony	mg/L	0.006	0.006	MAC	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
T-Arsenic	mg/L	0.025	0.025	IMAC	0.0003	<0.0002	0.0003	0.0004	0.0003	0.0002	0.0004	0.0018	0.0007	0.0008
T-Barium	mg/L	1.0	1	MAC	0.01	0.005	0.006	0.006	0.003	0.006	0.003	0.011	0.009	0.01
T-Boron	mg/L	5.0	5	MAC	0.132	0.02	0.166	0.187	0.234	0.105	0.193	0.143	0.121	0.143
T-Cadmium	mg/L	0.005			<0.0001	0.00001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
T-Calcium	mg/L				11	26.1	14.4	7.4	4.2	13.6	5.74	15.1	13.3	14.6
T-Chromium	mg/L	0.05	0.05	MAC	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	0.0008	<0.0004	<0.0004	0.0008
T-Copper	mg/L	1.0	<=1	MAC	0.001	0.009	0.007	0.026	0.007	0.011	0.008	0.002	0.001	0.002
T-Iron	mg/L	0.3	<=0.3	AO	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.04	<0.01	<0.010	<0.010
T-Lead	mg/L	0.01	0.01	MAC	0.0009	0.0014	0.0007	0.0011	0.0003	0.0007	0.0002	0.0001	0.0003	0.0001
T-Lithium	mg/L											0.018	0.017	0.019
T-Magnesium	mg/L		<=700	AO	2	4.1	1.9	1.1	0.5	2.1	0.94	2.69	2.38	2.52
T-Manganese	mg/L	0.05	<=0.05	AO	0.085	0.009	0.008	0.009	<0.005	<0.005	0.0005	0.0106	0.0125	0.046
T-Mercury	mg/L	0.001	0.001	MAC	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.01	<0.01	<0.01	<0.00001
T-Nickel	mg/L											<0.001	<0.001	<0.001
T-Phosphorus	mg/L											0.03	0.018	<0.01
T-Potassium	mg/L				0.6	<0.4	<0.4	<0.4	<0.4	0.4	0.2	0.9	0.9	0.9
T-Selenium	mg/L	0.01	0.01	MAC	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	0.0002	0.0008	<0.0006	<0.0006	<0.0006
T-Silver	mg/L											<0.00001	<0.00001	<0.00001
T-Sodium	mg/L	200	<=200	AO	125	13.7	81.2	124	116	76.6	113	160	140	142
T-Uranium	mg/L	0.1	0.1	MAC	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0004
T-Zinc	mg/L	5	<5	AO	0.003	0.032	0.022	0.019	0.014	0.035	0.011	0.013	0.005	0.007
Total Coliform	cfu/100ml	<1	<1	cfu/100ml			*11	<1	<1	*360	<1	<1	<1.0	<1.0
Fecal Coliform	cfu/100ml	<1	<1	cfu/100ml			<1	<1	<1	*7	<1	<1		
E.coli	cfu/100ml	<1	<1	cfu/100ml					<1	*7	<1	<1	<1.0	<1.0

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

*Resampled and had <1 for all Coliforms



Regional District of Nanaimo - Water Services Department

Decourcey Water Analysis - 2010 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Jan-10	2418 Pylades					6	7.5	0.02	316	0.3	655	0.02	0.004
11-Jan-10	2418 Pylades			0	0	7	7.0	0.02	318	0.3	663		
19-Jan-10	2418 Pylades	0	0	0	0	7	6.9	0.02	313	0.3	655		
27-Jan-10	2418 Pylades			0	0	7	7.2	0.02	317	0.3	660		
	Average	0	0	0	0	6.8	7.2	0.02	316.0	0.3	658.3	0.02	0.004
	Maximum	0	0	0	0	7	7.5	0.02	318	0.3	663	0.02	0.004
	Minimum	0	0	0	0	6	6.9	0.02	313	0.3	655	0.02	0.004

Red font indicates non-compliance with Canadian Drinking Water Guidelines

Aesthetic Objective for Iron is • 0.3 mg/L

Aesthetic Objective for Manganese is • 0.05mg/L

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

Yellow Column Coliform tests are completed by Health Department

Blue column 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 - Water Services Department

Decourcey Water Analysis - 2010 Monthly Report



Date	Sample Location (Address)	Health Department		In-House									
		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
8-Feb-10	2418 Pylades	0	0	0	0	8	7.4	0.01	311	0.3	650	0.04	0.004
16-Feb-10	2418 Pylades			0	0	8	7.4	0.02	306	0.3	637		
22-Feb-10	2418 Pylades			0	0	7	7.2	0.03	305	0.3	640		
	Average	0	0	0	0	7.7	7.3	0.02	307.3	0.3	642.3	0.04	0.004
	Maximum	0	0	0	0	8	7.4	0.03	311	0.3	650	0.04	0.004
	Minimum	0	0	0	0	7	7.2	0.01	305	0.3	637	0.04	0.004

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1-Mar-10	2418 Pylades	0	0	0	0	7	7.4	0.02	301	0.3	627	0.02	0.007
8-Mar-10	2418 Pylades			0	0	8	6.9	0.03	298	0.3	625		
23-Mar-10	2418 Pylades			0	0	9	7.2	0.03	298	0.3	622		
29-Mar-10	2418 Pylades			0	0	8	7.1	0.02	293	0.3	610		
	Average	0	0	0	0	8.0	7.2	0.03	297.5	0.3	621.0	0.02	0.007
	Maximum	0	0	0	0	9	7.4	0.03	301	0.3	627	0.02	0.007
	Minimum	0	0	0	0	7	6.9	0.02	293	0.3	610	0.02	0.007

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6-Apr-10	2418 Pylades			0	0								
12-Apr-10	2418 Pylades	0	0	0	0	9	6.9	0.02	290	0.3	604	0.04	0.003
19-Apr-10	2418 Pylades			0	0	9	6.8	0.02	286	0.3	597		
26-Apr-10	2418 Pylades			0	0	10	6.9	0.02	279	0.3	583		
	Average	0	0	0	0	9.3	6.9	0.02	285.0	0.3	594.7	0.04	0.003
	Maximum	0	0	0	0	10	6.9	0.02	290	0.3	604	0.04	0.003
	Minimum	0	0	0	0	9	6.8	0.02	279	0.3	583	0.04	0.003

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Date	Sample Location (Address)	Health Department		In-House									
		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-May-10	2418 Pylades			0	0	12	6.8	0.01	290	0.2	591	0.02	0.004
11-May-10	2418 Pylades			0	0	12	6.9	0.02	296	0.3	618		
17-May-10	2418 Pylades	0	0	0	0	12	7.1	0.02	294	0.3	612		
25-May-10	2418 Pylades			0	0	n/a	7.1	0.01	307	0.3	640		
	Average	0	0	0	0	12.0	7.0	0.02	296.8	0.3	615.3	0.02	0.004
	Maximum	0	0	0	0	12	7.1	0.02	307	0.3	640	0.02	0.004
	Minimum	0	0	0	0	12	6.8	0.01	290	0.2	591	0.02	0.004

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		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
19-Jun-10	2458 Pylades			0	0								
21-Jun-10	2418 Pylades	0	0	0	0		7.6	0.01	340	0.3	705		
28-Jun-10	2458 Phlades			0	0		7.6	0.02	344	0.3	713		
	Average	0	0	0	0	#DIV/0!	7.6	0.02	342.0	0.3	709.0	#DIV/0!	#DIV/0!
	Maximum	0	0	0	0	0	7.6	0.02	344	0.3	713	0	0
	Minimum	0	0	0	0	0	7.6	0.01	340	0.3	705	0	0

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		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
5-Jul-10	2458 Pylades			0	0		7.5	0.02	351	0.4	730	0.01	0.008
12-Jul-10	2458 Pylades			0	0		7.7	0.06	350	0.3	727		
19-Jul-10	2458 Pylades	0	0	0	0		7.5	0.02	349	0.4	730		
26-Jul-10	2458 Pylades			0	0		7.6	0.01	352	0.4	732		
	Average	0	0	0	0	#DIV/0!	7.6	0.03	350.5	0.4	729.8	0.01	0.008
	Maximum	0	0	0	0	0	7.7	0.06	352	0.4	732	0.01	0.008
	Minimum	0	0	0	0	0	7.5	0.01	349	0.3	727	0.01	0.008

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		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
3-Aug-10	2458 Pylades			0	0		7.6	0.02	354	0.4	736	0.02	0.017
10-Aug-10	2458 Pylades	0	0	0	0	17	7.5	0.02	357	0.4	744		
16-Aug-10	2458 Pylades			0	0		7.2	0.02	364	0.4	770		
23-Aug-10	2458 Pylades			0	0	17	7.8	0.01	358	0.4	746		
30-Aug-10	2458 Pylades			0	0	17	7.3	0.01	361	0.4	749		
	Average	0	0	0	0	17.0	7.5	0.02	358.8	0.4	749.0	0.02	0.017
	Maximum	0	0	0	0	17	7.8	0.02	364	0.4	770	0.02	0.017
	Minimum	0	0	0	0	17	7.2	0.01	354	0.4	736	0.02	0.017

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		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
7-Sep-10	2458 Pylades			0	0	16	7.3	0.02	352	0.4	760	0.02	0.014
13-Sep-10	2458 Pylades			0	0	15	7.5	0.03	360	0.4	763		
20-Sep-10	2458 Pylades	0	0	0	0		7.4	0.01	359	0.4	748		
28-Sep-10	2458 Pylades			0	0		7.6	0.01	359	0.4	744		
	Average	0	0	0	0	15.5	7.5	0.02	357.5	0.4	753.8	0.02	0.014
	Maximum	0	0	0	0	16	7.6	0.03	360	0.4	763	0.02	0.014
	Minimum	0	0	0	0	15	7.3	0.01	352	0.4	744	0.02	0.014

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		Fecal Coliform *	Total Coliform *	Fecal Coliform *	Total Coliform *	Temp. (°C)	pH	Free Chlorine Residual (mg/L)	Total Dissolved Solids (mg/L)	Salinity (%)	Conductivity (µS/cm)	Total Iron (mg/L)	Manganese (mg/L)
4-Oct-10	2458 Pylades			0	0	15	7.4	0.01	359	0.4	745	0.02	0.009
12-Oct-10	2458 Pylades	0	0	0	0	14	7.6	0.02	356	0.4	740		
18-Oct-10	2459 Pylades			0	0		8	0.02	354	0.4	741		
25-Oct-10	2458 Pylades			0	0		7.8		357	0.4	752		
	Average	0	0	0	0	14.5	7.7	0.02	356.5	0.4	744.5	0.02	0.009
	Maximum	0	0	0	0	15	8	0.02	359	0.4	752	0.02	0.009
	Minimum	0	0	0	0	14	7.4	0.01	354	0.4	740	0.02	0.009

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1-Nov-10	2458 Pylades			0	0	12	7.8	0.01	365	0.4	755	0.03	0.003
8-Nov-10	2458 Pylades			0	0	11	7.7	0	360	0.4	779		
15-Nov-10	2458 Pylades	0	0	0	0	10	7.5	0.02	357	0.4	744		
22-Nov-10	2458 Pylades			0	0	8	7.7	0.05	348	0.3	745		
29-Nov-10	2458 Pylades			0	0	7	7.6	0.03	358	0.4	741		
	Average	0	0	0	0	9.6	7.7	0.02	357.6	0.4	752.8	0.03	0.003
	Maximum	0	0	0	0	12	7.8	0.05	365	0.4	779	0.03	0.003
	Minimum	0	0	0	0	7	7.5	0	348	0.3	741	0.03	0.003

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6-Dec-10	2458 Pylades	0	0	0	0	6	7.4	0.01	353	0.4	742	0.06	0.024
13-Dec-10	2458 Pylades			0	0		7.6	0.02	354	0.4	736		
20-Dec-10	2459 Pylades			0	0		7.3	0.01	361	0.4	750		
29-Dec-10	2459 Pylades			0	0		7.5	0.01	349	0.4	745		
	Average	0	0	0	0	6.0	7.5	0.01	354.3	0.4	743.3	0.06	0.024
	Maximum	0	0	0	0	6	7.6	0.02	361	0.4	750	0.06	0.024
	Minimum	0	0	0	0	6	7.3	0.01	349	0.4	736	0.06	0.024

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APPENDIX C

EMERGENCY RESPONSE PLAN

EMERGENCY RESPONSE PLAN

REGIONAL DISTRICT
OF
NANAIMO

WATER SYSTEMS

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Prime Responsibilities

- Provide safe drinking water.
- Provide potable water for sanitation purposes.
- Provide water for fire suppression.
- Prevent unnecessary loss of stored water.
- Restore the integrity of the entire water system as soon as possible.
- Maintain integrity and quality of supply.

Emergency Response and Recovery Actions

- Analyze the type and severity of the emergency.
- Provide emergency assistance to save lives.
- Reduce the probabilities of additional injuries or damage.
- Provide situational reporting to appropriate agencies as required.
- Perform emergency repairs based on priority demand.
- Return system to normal levels. (recovery)
- Evaluate response and preparedness plan.
- Revise plan as necessary.
- Provide maps, notices, and direction necessary for water recovery.

Communication Check List

In an emergency it will be important to contact the key people shown below. This will help reduce confusion and assist in ensuring any important messaging is done so correctly and quickly.

IF REQUIRED, CONTACT P.E.P or V.I.H.A. BEFORE MAKING THE FOLLOWING CONTACTS AS PER THE EMERGENCY PLANS

RDN Priority Contacts

MANAGER OF WATER SERVICES	MIKE DONNELLY <i>(250) 390-6560</i>
G.M. REGIONAL & COMMUNITY UTILITIES	JOHN FINNIE <i>(250) 390-6560</i>
COMMUNICATIONS COORDINATOR.....	ADRIENNE MERCER <i>(250) 390-4111</i>
EMERGENCY COORDINATOR.....	JANI THOMAS <i>(250) 713-2057(cell)</i>

Key Communication Options

Management Support

- Contact Electoral Area Director
- Contact the local radio station and provide a brief message if public health and safety are at risk. Follow up with a press release.

Field Staff Support

- Post notices on household front doors.
- Attach warning signs to existing Water Sprinkling Regulation signs in each community.
- Put up roadside signage at the entrance to the community.

Administrative Support

- Provide information message on the RDN web site.
- Review after hours office and voice mail messaging.
- Provide notification to other RDN staff.

Emergency Contact Numbers

Personnel Contacts

<i>Name</i>	<i>Position</i>	<i>Phone</i>
Dave	Chief Operator	(250) 248-4914
Randy	Operator II	(250) 248-4914
Heather	Operator III	(250) 248-4914
Brian	Operator III	(250) 248-4914
Brad	Operator II	(250) 248-4914
Lyndon	Operator II	(250) 248-4914
Mike Donnelly	Manager of Water Services	(250) 390-6560
Deb Churko	Engineering Technologist	(250) 390-6560
Jack Eubank	Bylaw Officer	(250) 390-6560
John Finnie	General Manager	(250) 390-6560

Electoral Area Directors

<i>Electoral Area</i>	<i>Director</i>	<i>Phone</i>	<i>email address</i>
A	Joe Burnett	722-2656	quailanding@shaw.ca
B	Gisele Rudischer	247-8795	giselerudischer@gmail.com
C	Maureen Young	754-5896	Maureen_young@shaw.ca
E	George Holme	468-7237	gholme@shaw.ca
F	Lou Biggemann	248-9078	lwb@shaw.ca
G	Joe Stanhope	248-6401	jstanhope@shaw.ca
H	Dave Bartram	757-9737	dwbartram@shaw.ca

Government Agency Contacts

Ministry of Environment	Nanaimo	(250) 751-3100
Department of Fisheries and Oceans	Nanaimo	754-0230
Provincial Emergency Preparedness (PEP) and Dangerous Goods Spills	Victoria	1-800-663-3456
Environmental Health Office	Parksville	947-8222
Bill Wrathall, Env. Health Officer	Parksville	947-8222
Environmental Health Office	Nanaimo	755-6215
Murray Sexton, Public Health Engineer	Nanaimo	755-6293
Medical Health Officer	Nanaimo	740-6988
		<i>or after hours</i> 1-800-204-6166
City of Parksville Public Works	Parksville	248-5412
Town of Qualicum Beach Public Works	Qualicum Beach	752-6921
District of Lantzville	Lantzville	390-4006

Emergency

Hospital	- Nanaimo	754-2141
	- Parksville phone number (Nanaimo hospital)	248-2332
Ambulance	- Parksville	911 or 248-3511
	- Nanaimo	911 or 758-8181
Police	- Parksville	911 or 248-6111
	- Nanaimo	911 or 754-2345
Fire Department	- Parksville	911 or 248-3242
	- Nanoose Bay	911 or 468-7141
	- Qualicum Beach	911 or 752-6921
	- Cedar	911 or 722-3122

Priority Services

BC Hydro (Qualicum Beach number)	(250) 752-8012 or
BC Hydro– Derek Leik 755-4734	1-888-769-3766
Telus	811-2323 or
Telus- Paul McGrath cell 248-0983	741-7713 or 741-7716
Teresen Gas	248-4880
Shaw Cable (Nanaimo)	754-5571
CP Rail	1-800-716-9132
French Creek Pollution Control Centre	248-5794
Chlorine Manufacturer (Brentagg)	1-800-661-1830

Community Contacts

District 69 School Board Office	248-4241
Nanoose Bay School	468-7414
Nanoose Children's Centre	468-1784
Nanoose Place	468-5339
Nanoose Post Office	468-7722
Naval Base (Department of National Defense)	756-5021 or 468-5004

Excavation Services

Shoreline Equipment (Doug Penny)	468-7759 or 755-9502 (cell)
Lundine Backhoe Service (Jim Lundine)	752-6808 or 951-1508 (cell)

Electrical Contractors

Canem Electric	468-1887
East Isle Power (Harvey Sommerfeld)	821-0415 or 954-7463 (cell)
TC Trades (Tom Frenette)	756-0077 or 250-668-0078

Other Services

Plumbing Services (Maci Motor – Pump Repair)	(250) 248-4423
Bulk water supply (BC Water Service)	954-3628
Bottled water supply (Water Pure & Simple)	752-1373
EPCOR (Parksville)	951-2460
Sand and Gravel (Ozero)	752-1482
Sand and Gravel (Luissier & Sons)	468-9994
Pump Trucks (Action Tank Service)	248-3833
Pump Trucks and Toilet Rentals (A-1 Septic)	248-4438
Portable Washrooms (Coast Toilet Rentals)	753-7552
Running Water Enterprises (Water Hauling Service)	947-5197
Woods Water Hauling	758-2677
Fyfe’s Well and Water Services	752-4986 or 248-0830 (cell)

Suppliers

Four Star Waterworks (piping)	954-3546
Hwy Four Rentals (equipment & pumps)	248-1100
Iritex Pumps and Irrigation – (pumps)	248-7028
Windsor Plywood (miscellaneous building supplies)	752-3122
Albertsons Hardware (miscellaneous building supplies)	248-6888
Robinson Rentals	753-2465
United Rentals	758-3911

Media Services

Adrienne Mercer, RDN Communications Coordinator	1-877-607-4111 or 713-1075 (cell)
Radio Station (CKWV) Nanaimo and Parksville	758-1131
TV Station (CHEK)	383-2435
Newspaper (PQ News and The Weekender)	248-4341
The Oceanside Star	954-0600
Nanaimo Daily News / Harbour City Star	729-4212

Emergency Response Plans

Contamination of Source (Spills, Accidents, Vandalism)

Actions: Shut down pump
Notify Provincial Emergency Program (PEP)
Notify Health Unit
Notify all users if necessary under direction of Health Unit
Contact government agencies for advice and assistance
Contact local media for public service announcements
Post signs and deliver notices to homes and businesses. (See attached samples)
Arrange alternate source if necessary – i.e., bottled or bulk water
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environmental Health Department)
Provincial Emergency Preparedness, Police, Ministry of Environment
All schools and community centres – see *“Priority Contacts” List*
RCMP if there has been vandalism

Loss of Source – Loss Of Reservoir or Supply Lines

Actions: Ensure pumps are shut off. (To protect pump)
Notify all users
Contact government agencies for advice and assistance
Arrange alternate source – i.e., bottled water, bulk water, storage tank
Advise RDN supervisory personnel if necessary

Contacts: Local Health Unit (Environmental Health Department) and Ministry of Environment

Flood Conditions

Actions: Notify all users regarding the potential for water contamination, loss of pump, power, etc. Users should be advised to store some drinking water in advance, and to boil any suspect water for two minutes or disinfect with chlorine when flood conditions exist
Phone government contacts
Contact local media for public service announcement when customers can not be reached by phone
Post signs or deliver notices if necessary. (See attached samples)
Arrange alternate source if possible – i.e. bottled water, bulk hauler or storage tank
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environment Health Department), Provincial Emergency Preparedness, and Ministry of Environment

Broken Water Main

Actions: Shut pump off when backflow conditions have been prevented
Call for repairs as required – i.e. excavator, backhoe
Notify all users of interruption of service
Advise local Public Health office
Arrange alternate source if necessary
Advise RDN supervisory personnel

Contacts: Advise local Public Health office. (Environmental Health Department)

Chlorination Failure

Actions: Advise local Public Health Office
Shut off well pumps. Monitor reservoir levels.
Notify all users to boil water for two minutes or take other disinfection procedures in accordance with recommendations of local health officials
Post signs or deliver notices if necessary. (See attached samples)
Arrange chlorinator repairs
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environmental Health Officer)
Chlorinator manufacturer

Pump Failure

Actions: Notify all users of interruption of service
Call for repairs: pump manufacturer if necessary
Advise local Public Health office (if interruption not short term)
Arrange alternate source if necessary – bottled or bulk water, etc.
Advise RDN supervisory personnel if necessary

Contacts: Local Health Unit (Environmental Health Department)

Power Failure

Actions: Call BC Hydro. Find out when power will be restored
Start back-up generator or arrange to get one
Notify all users about interruption of service if backup not capable of maintaining supply
Post signs or deliver notices if necessary. (See attached samples)
Advise local Public Health Office
Arrange alternate source if necessary – bottled or bulk water, etc.
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environmental Health Department)

Backflow or Back Siphonage

Actions: Advise Medical Health Officer at local Health unit
Notify all users to boil water for two minutes or take other disinfection procedures in accordance with recommendations of local health officials
Purge and disinfect lines as directed, after corrections have been made
Post signs or deliver notices if necessary. (See attached samples)
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environmental Health Department)

Bacteria Count (RDN Lab)

Actions: Advise Medical Health Officer at local Health unit
Follow procedures in accordance with recommendations of local health officials
Post signs or deliver notices if necessary. (See attached samples)
Advise RDN supervisory personnel

Contacts: Local Health Unit (Environment Health Department)

APPENDICES

Boil Water Advisory Notice	10
Boil Water Order Notice	11
Unfit for Drinking Notice	12
Service Interruption Notice	13

sample

NOTICE

Boil Water Advisory

Effective date: _____

Please note that all water used for domestic purposes (drinking, cooking, etc.) should be boiled before consumption. The boiling should be at a rolling boil and for a minimum of one minute.

RDN Water Services staff are continually monitoring the water supply system and will provide updates as they become available.

Watch for information updates at www.rdn.bc.ca (WaterSmart) and listen to your local radio station for more information.

This advisory will be in effect until further notice.

For further information contact the

Regional District of Nanaimo at:
1-877-607-4111 or 1-250-390-4111
Water Services Field Office: 1-250-248-4914

Sample **NOTICE**
Boil Water Order

Effective date: _____

Please note that all water used for domestic purposes (drinking, cooking, etc.) should be boiled before consumption. The boiling should be at a rolling boil and for a minimum of two minutes.

RDN Water Services staff are continually monitoring the water supply system and will provide updates as they become available.

Watch for information updates at www.rdn.bc.ca (WaterSmart) and listen to your local radio station for more information.

This order will be in effect until further notice.

For further information contact the

Regional District of Nanaimo at:
1-877-607-4111 or 1-250-390-4111
Water Services Field Office: 1-250-248-4914

WARNING

sample

**This Water is
Considered
Unfit for Drinking
or Domestic Use**

Effective date: _____

For further information contact the

Regional District of Nanaimo at:

1-877-607-4111 or 1-250-390-4111

Water Services Field Office: 1-250-248-4914

Sample

NOTICE

Water Supply Service Interruption

Effective date: _____

Please be advised that your water service may be interrupted or off for periods during the day.

When service is resumed, the water may be discoloured. This is due to disturbed deposits in the pipes and is not harmful.

This advisory will be in effect until further notice.

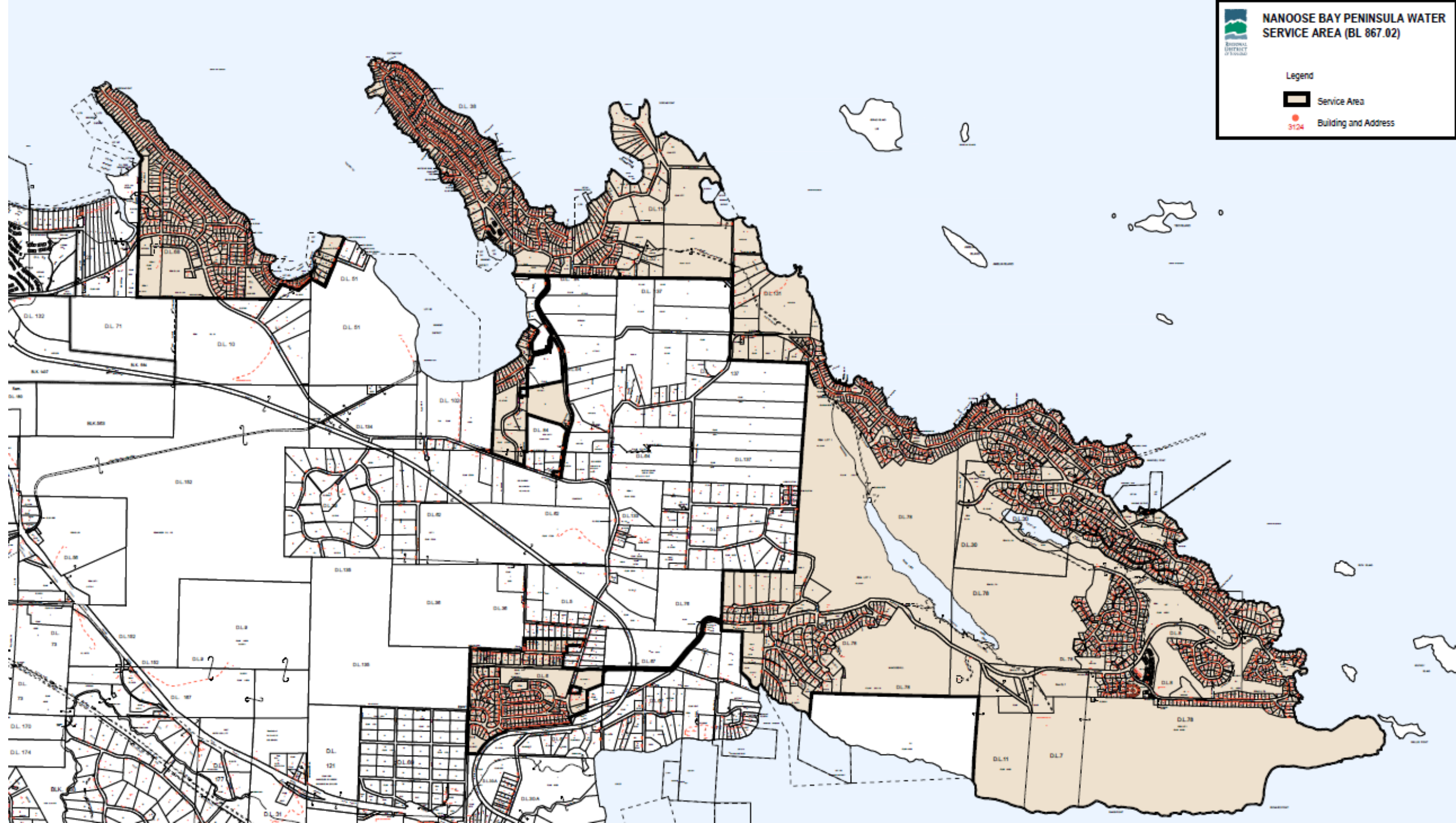
For further information contact the

Regional District of Nanaimo at:
1-877-607-4111 or 1-250-390-4111
Water Services Field Office: 1-250-248-4914

MAPS

Water Service Areas

Nanoose Bay Peninsula Water Service Area	Map 1
Neighbourhoods: Madrona/Wall Beach	Map 2
Fairwinds	Map 3
Arbutus Park	Map 4
West Bay	Map 5
Driftwood	Map 6
French Creek Water Service Area	Map 7
Surfside Water Service Area	Map 8
San Pareil Water Service Area	Map 9
Englishman River Water Service Area	Map 10
Melrose Water Service Area	Map 11
Decourcey Water Service Area	Map 12
Whiskey Creek Water Service Area	Map 13

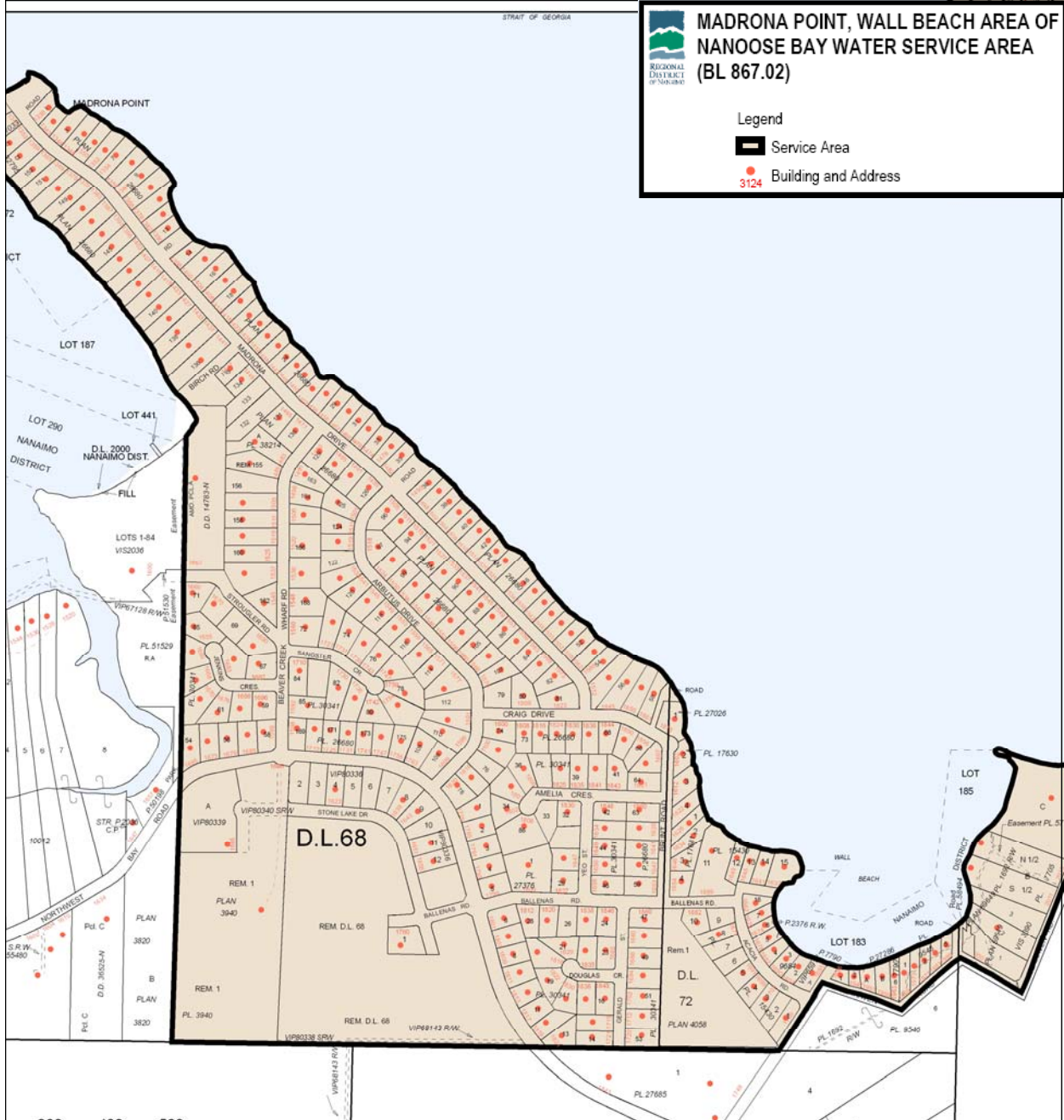



NANOOSE BAY PENINSULA WATER SERVICE AREA (BL 867.02)

Legend

- Service Area
- Building and Address



MAP 1 NANOOSE BAY PENINSULA



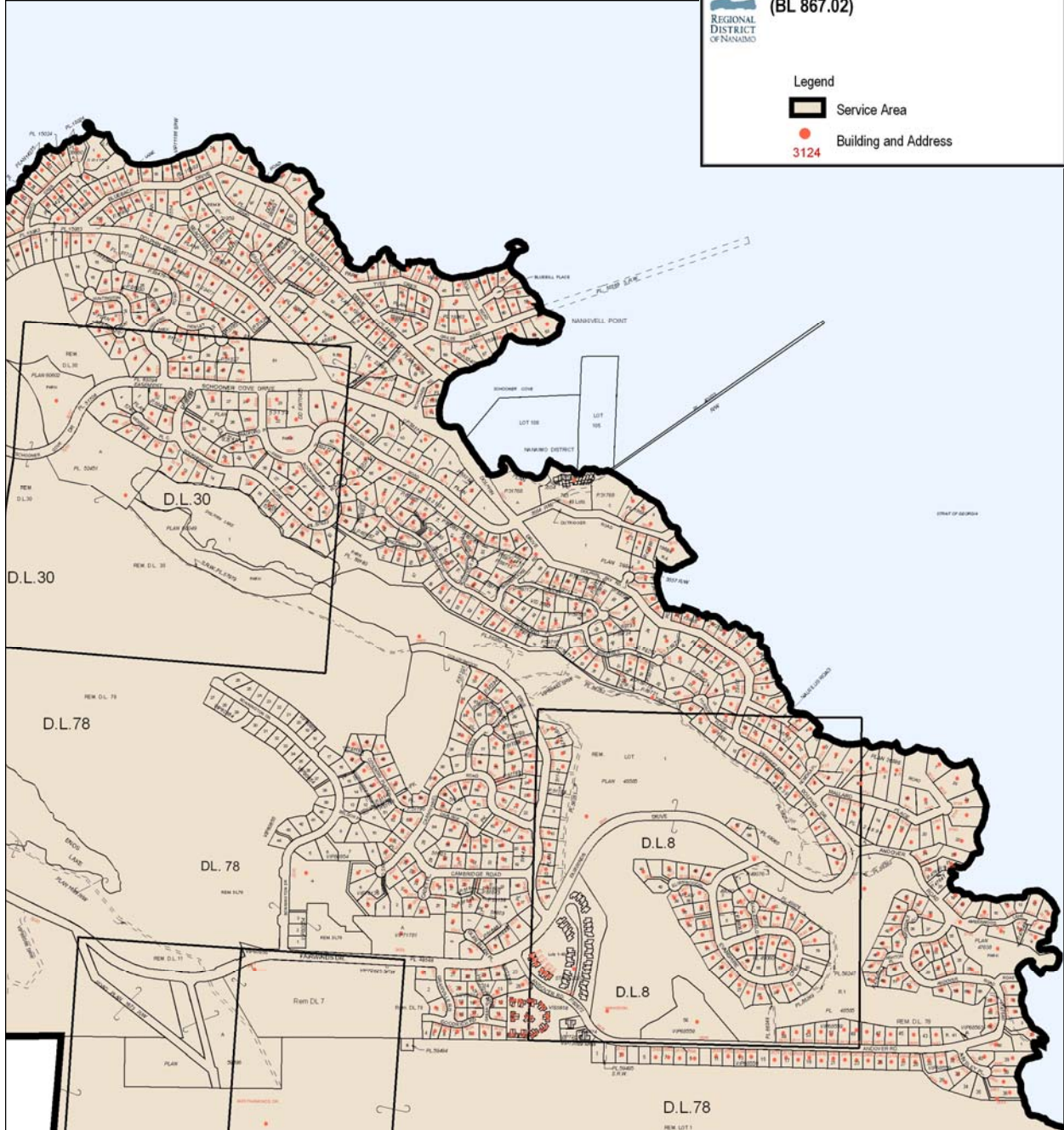


FAIRWINDS AREA OF NANOOSE BAY
WATER SERVICE AREA
(BL 867.02)

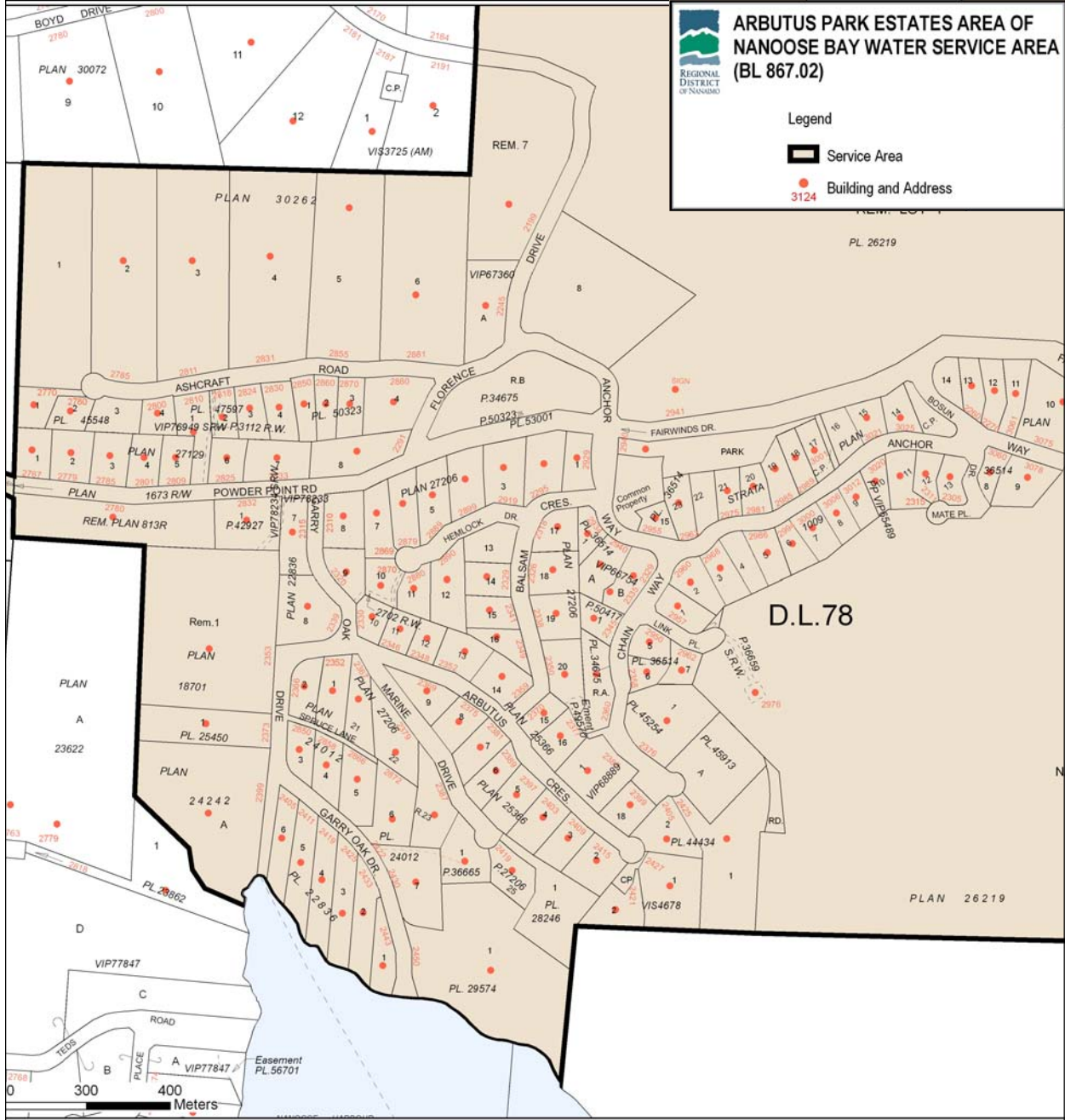
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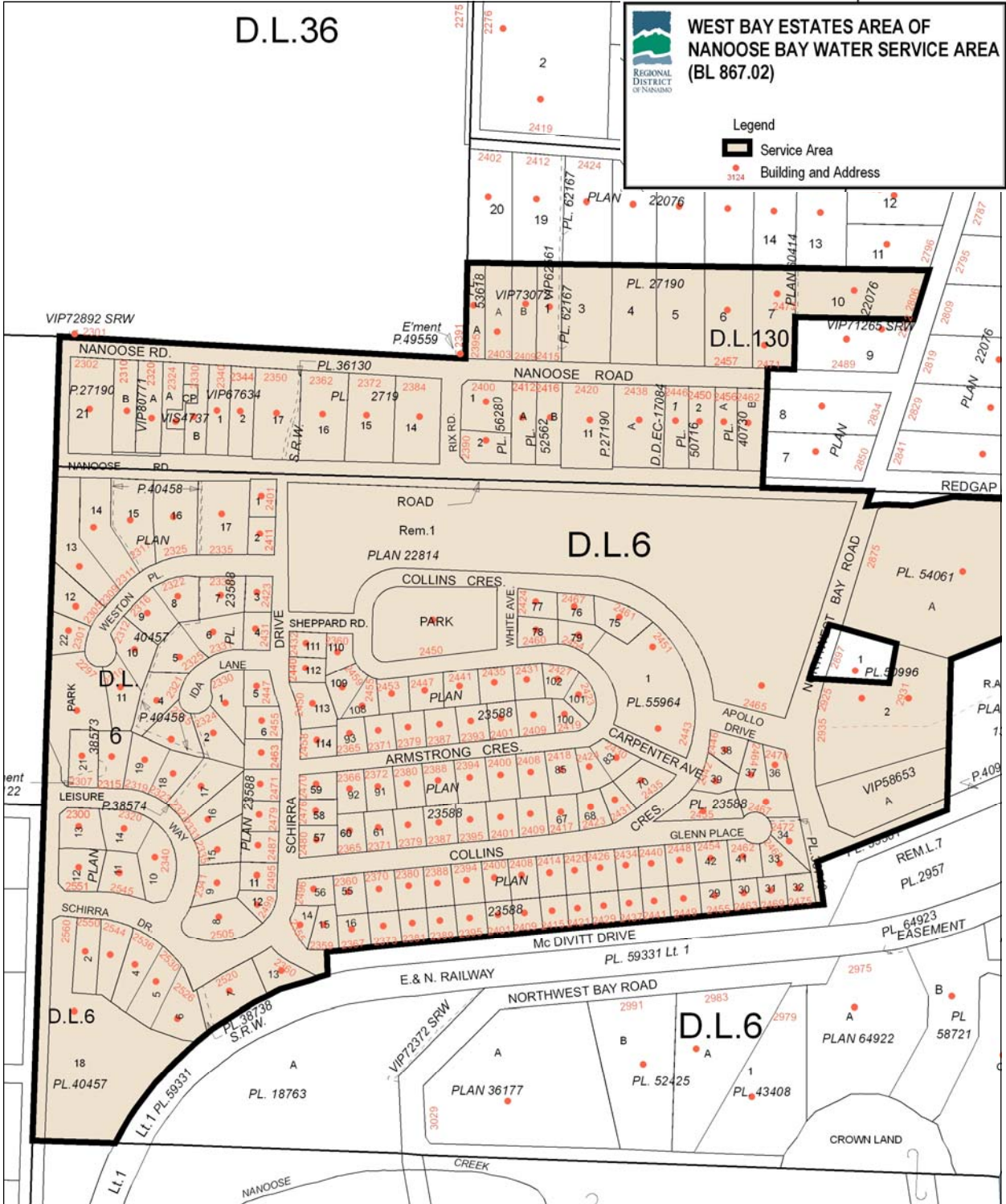
-  Service Area
-  Building and Address

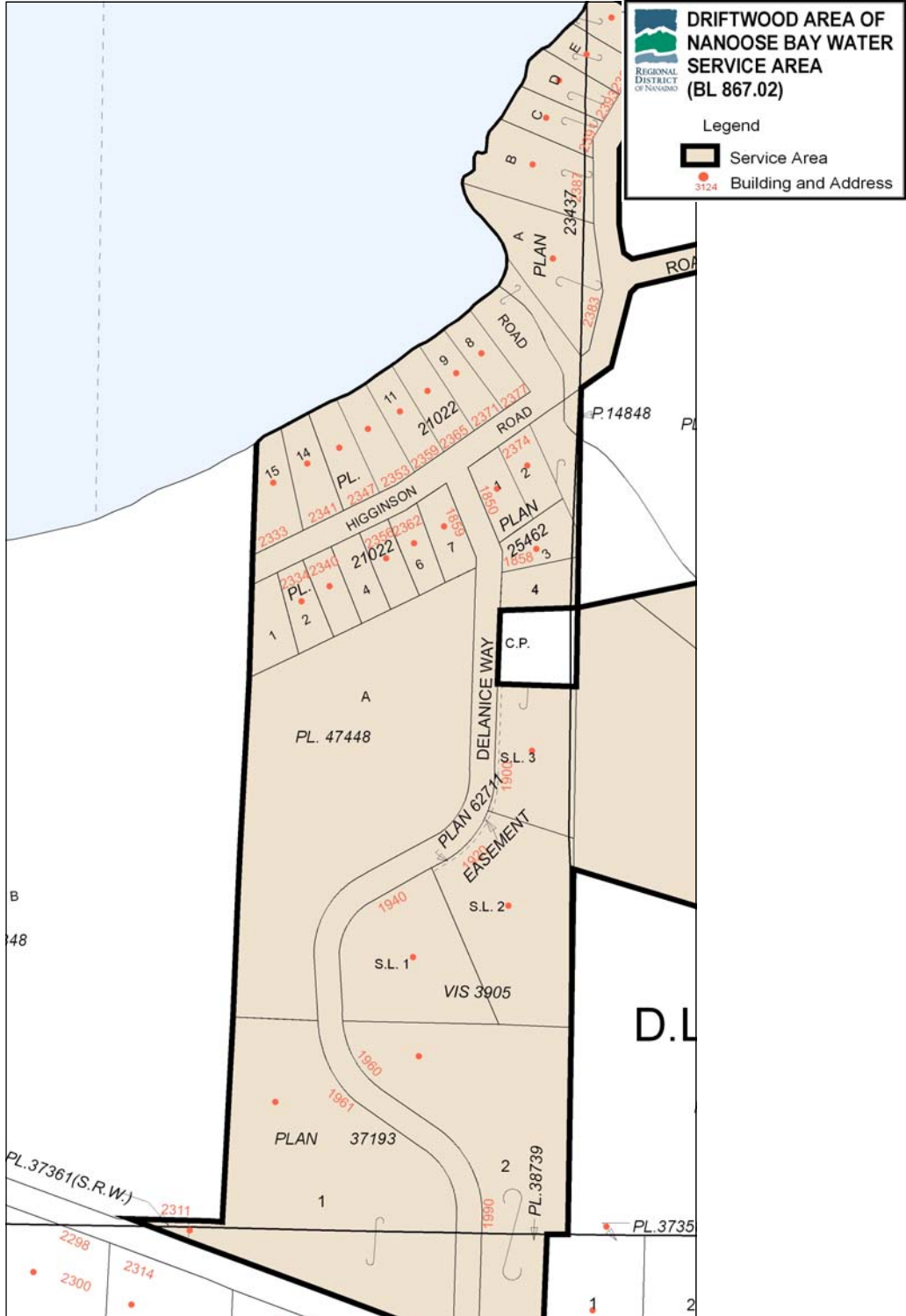
3124



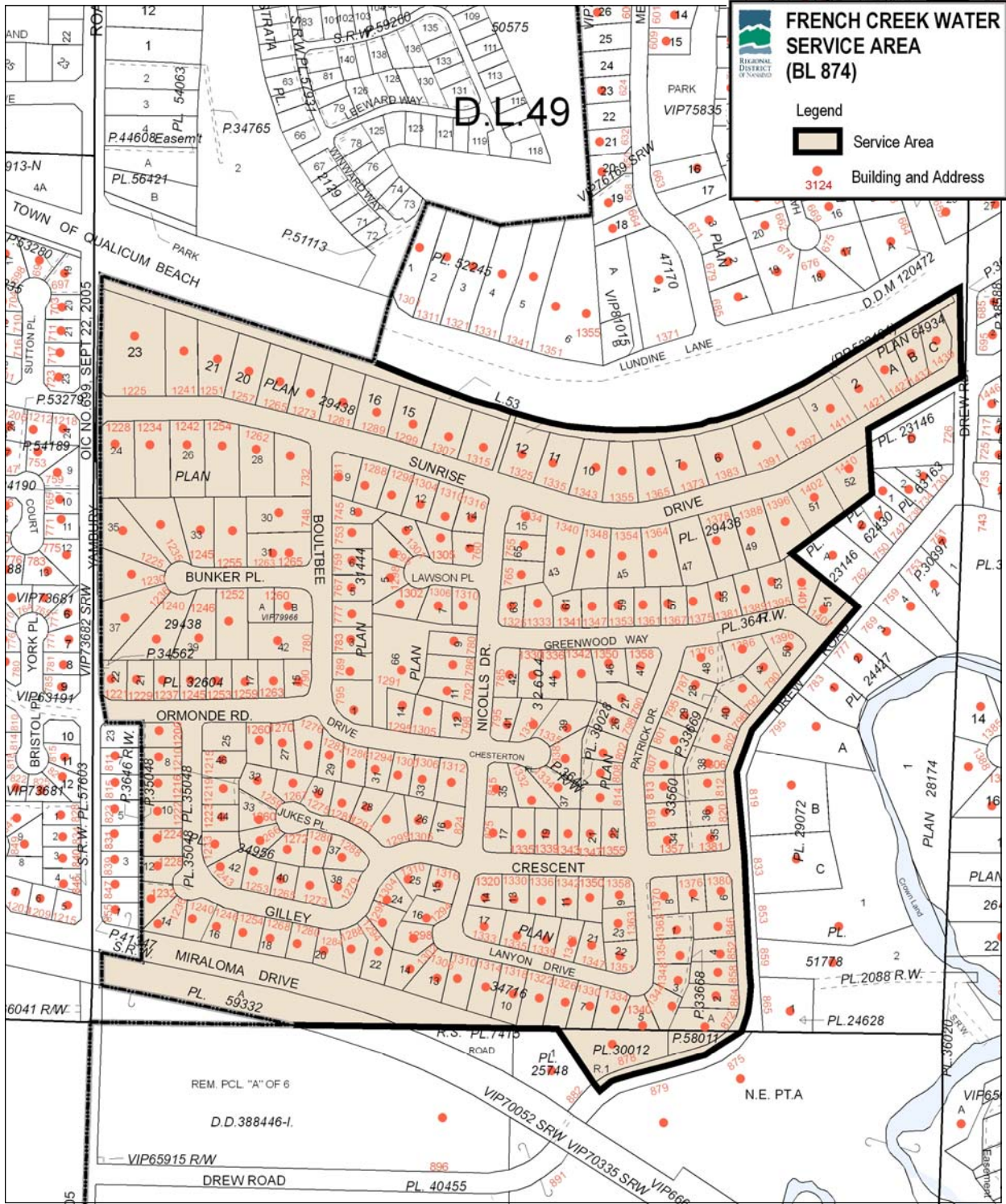
MAP 3 FAIRWINDS







MAP 6 DRIFTWOOD



MAP 7 FRENCH CREEK

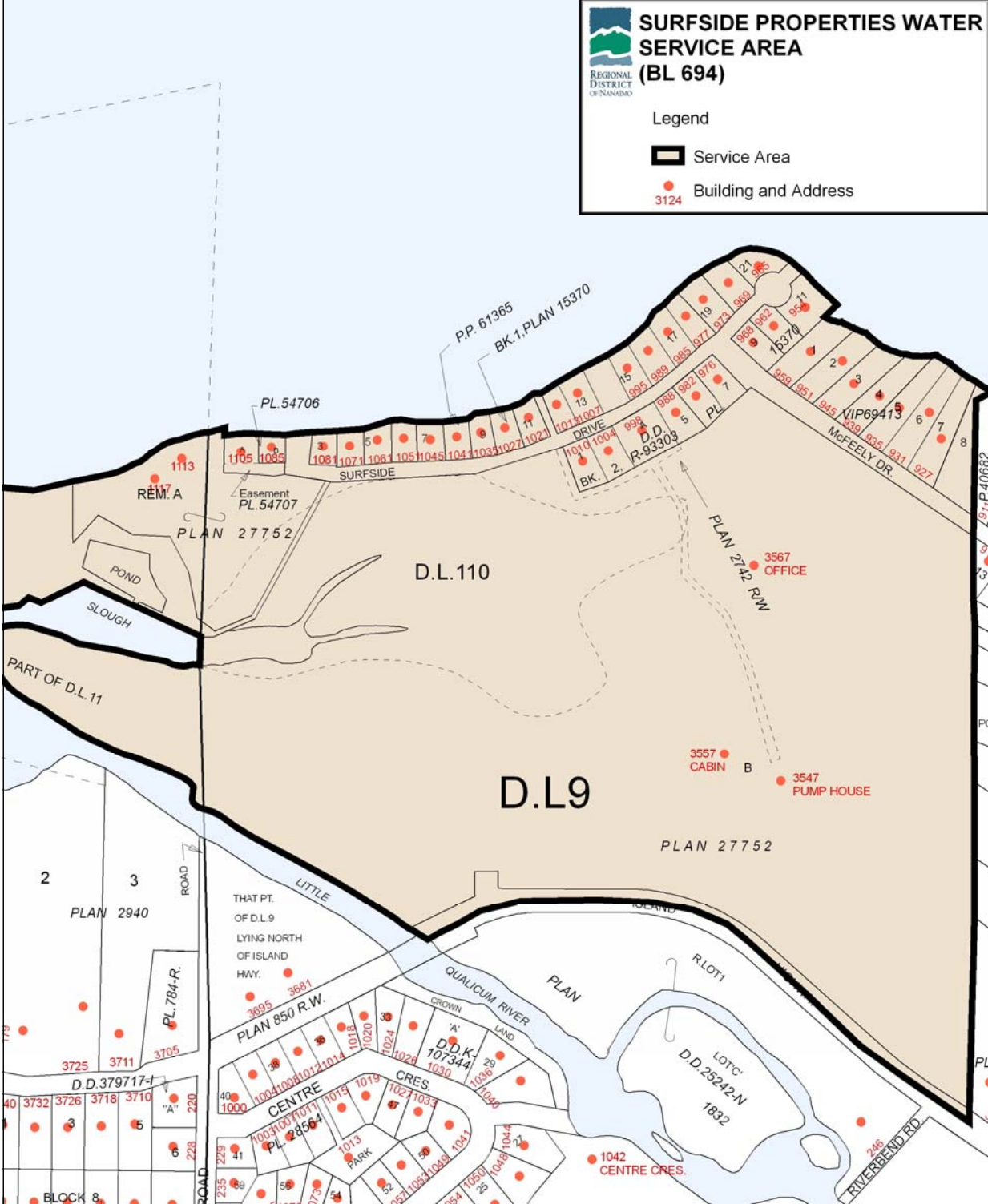


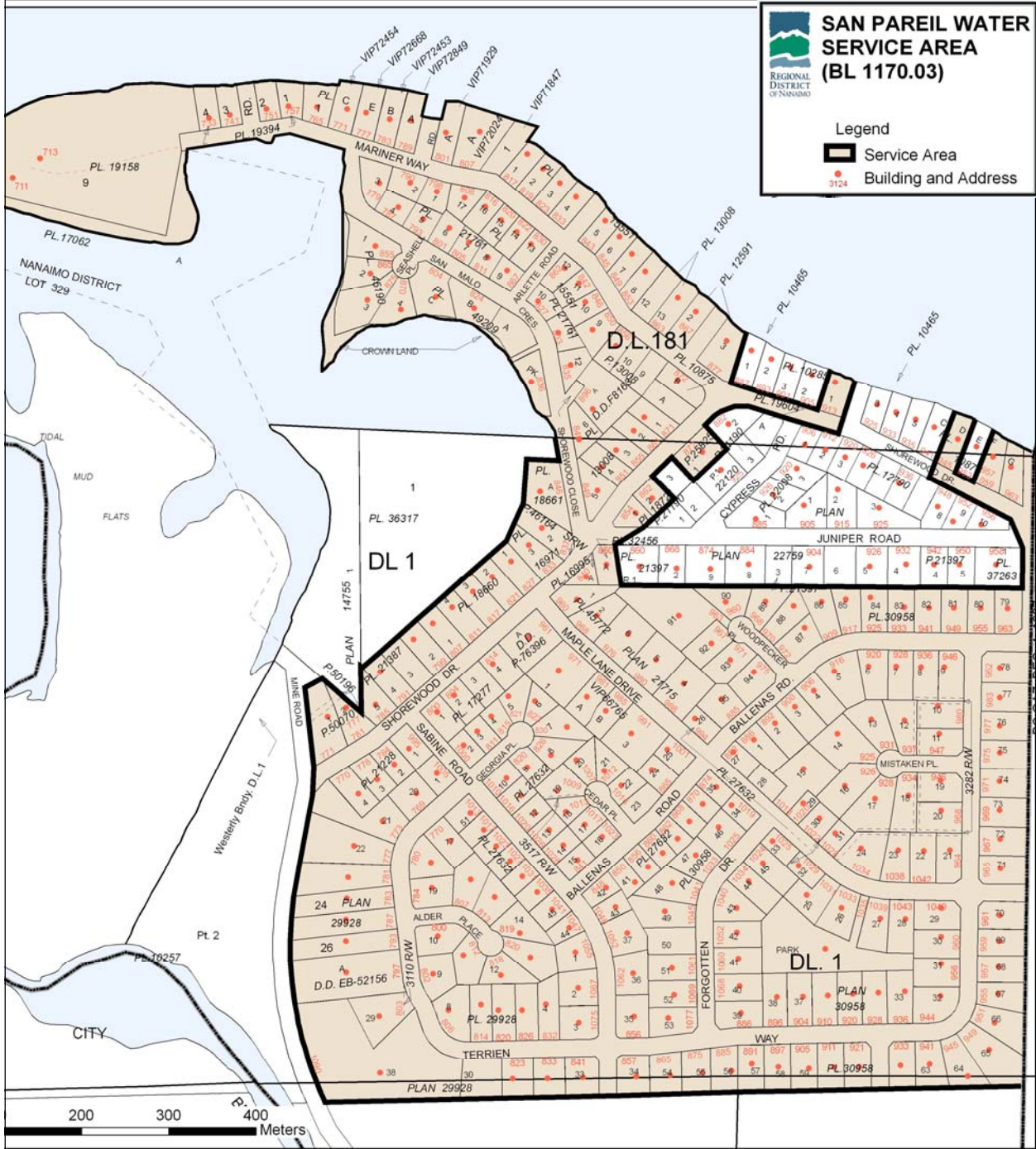
SURFSIDE PROPERTIES WATER SERVICE AREA (BL 694)

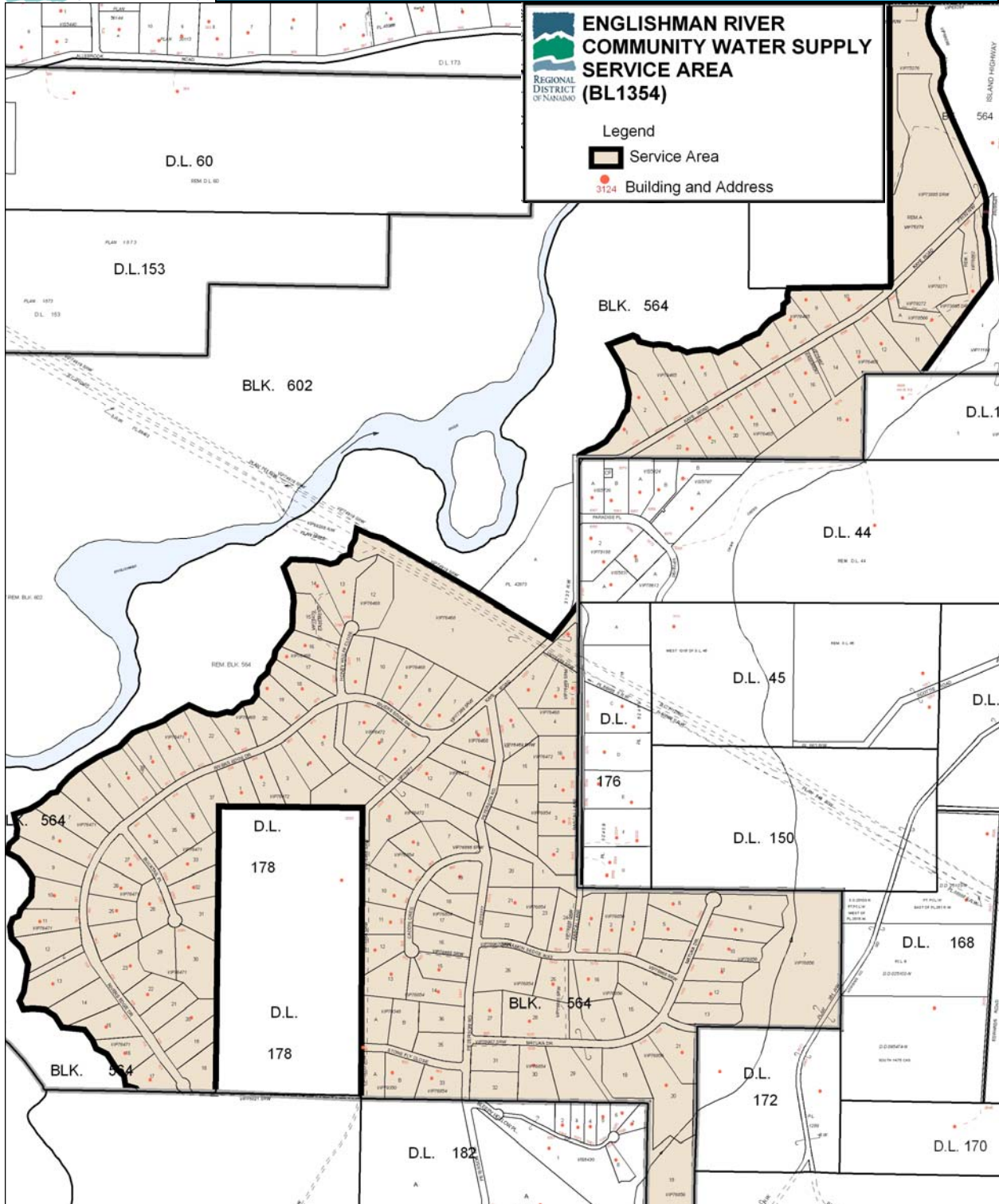
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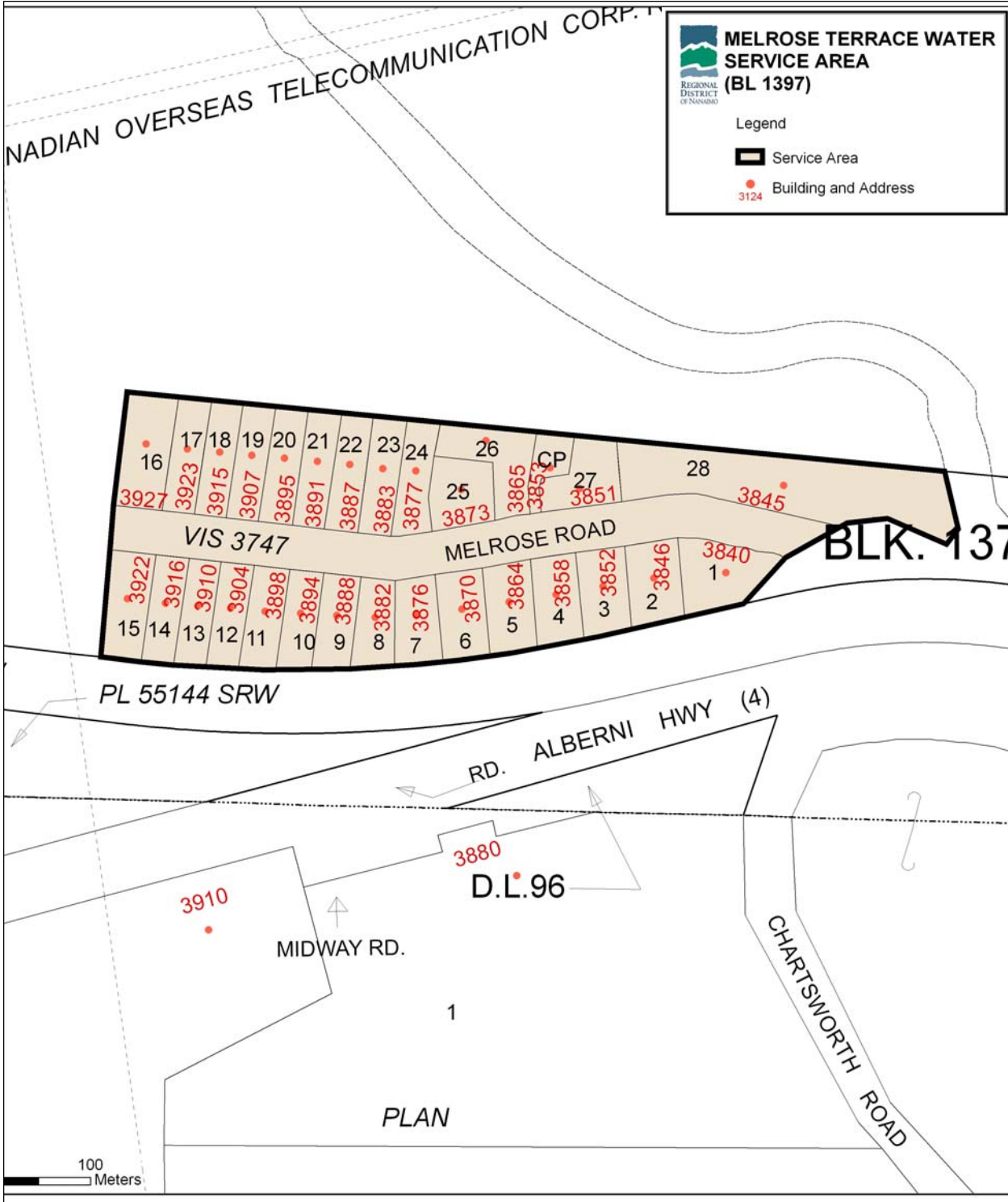
Service Area

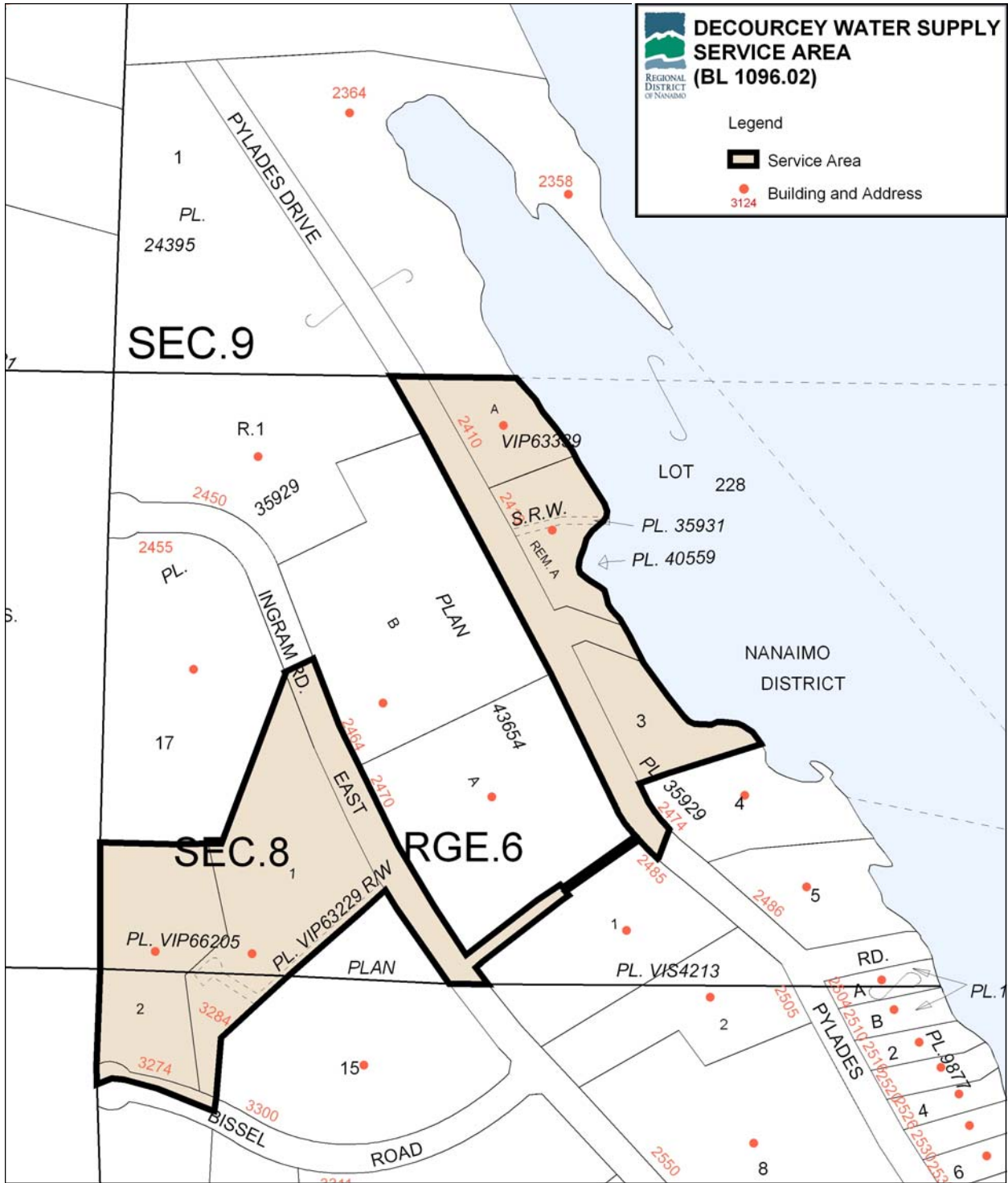
Building and Address

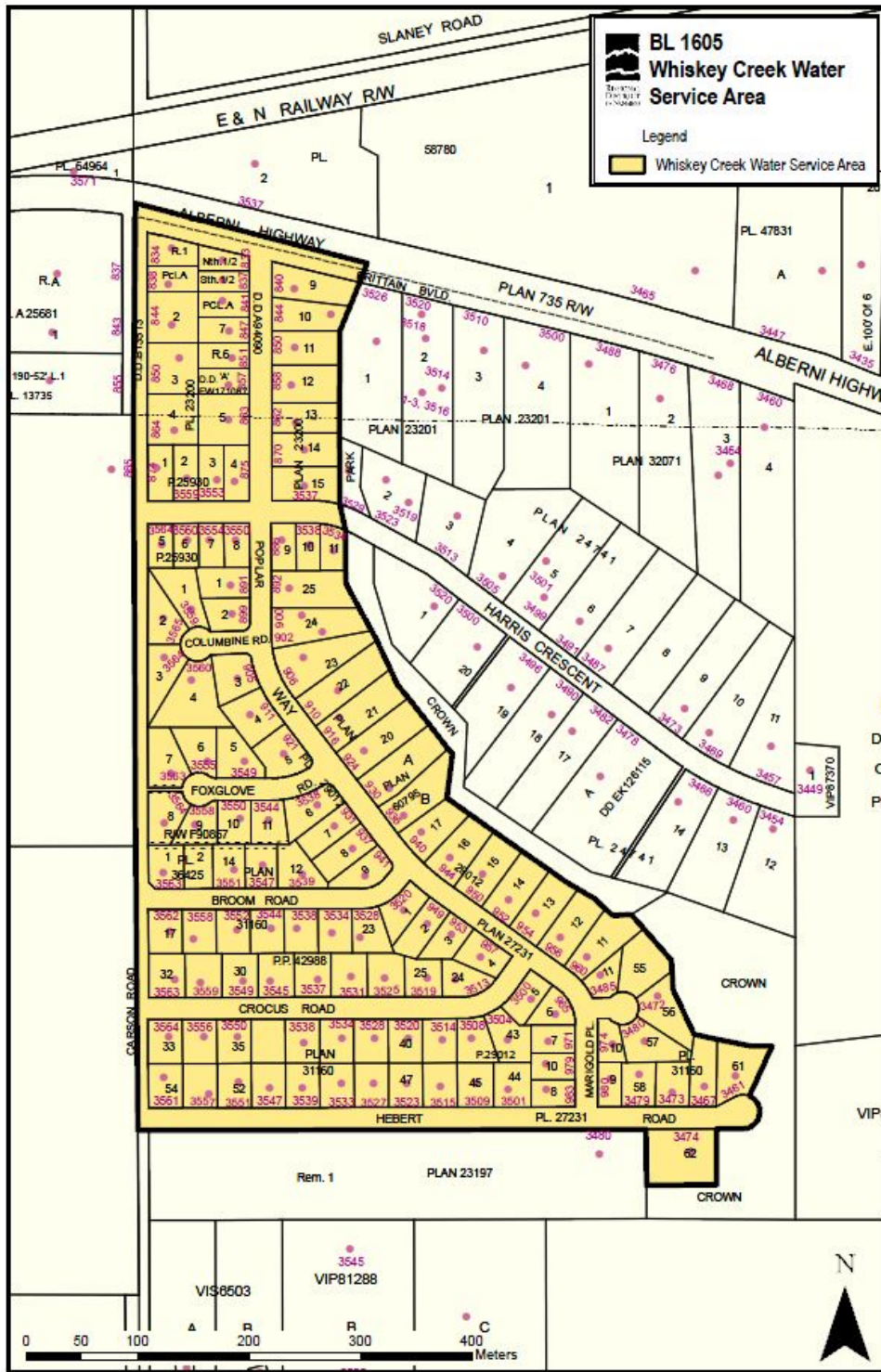












MAP 13 WHISKEY CREEK