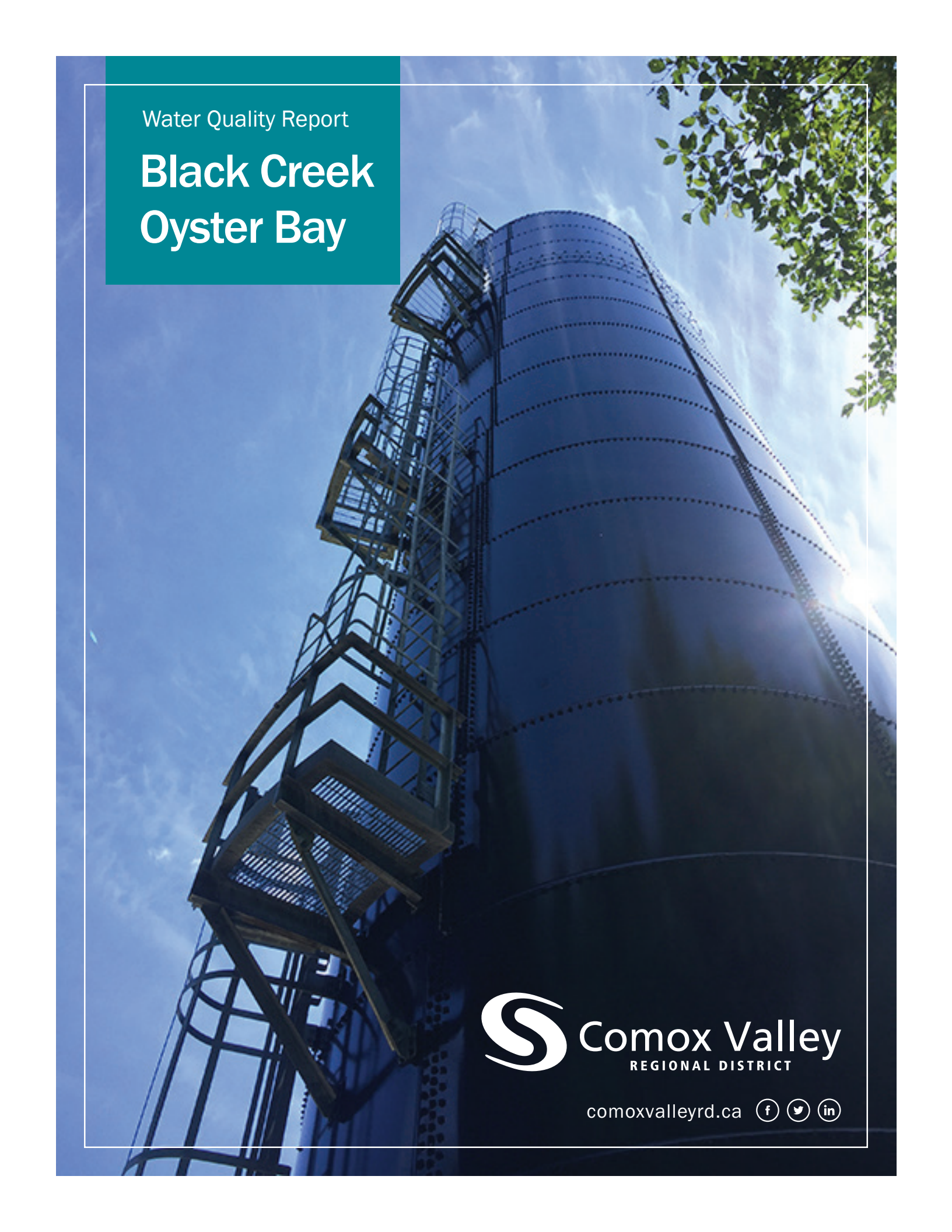


A low-angle photograph of a tall, cylindrical metal water tower against a clear blue sky. The tower has a spiral staircase on its exterior. In the top right corner, some green leaves of a tree are visible.

Water Quality Report

Black Creek Oyster Bay

 **Comox Valley**
REGIONAL DISTRICT

comoxvalleyrd.ca   

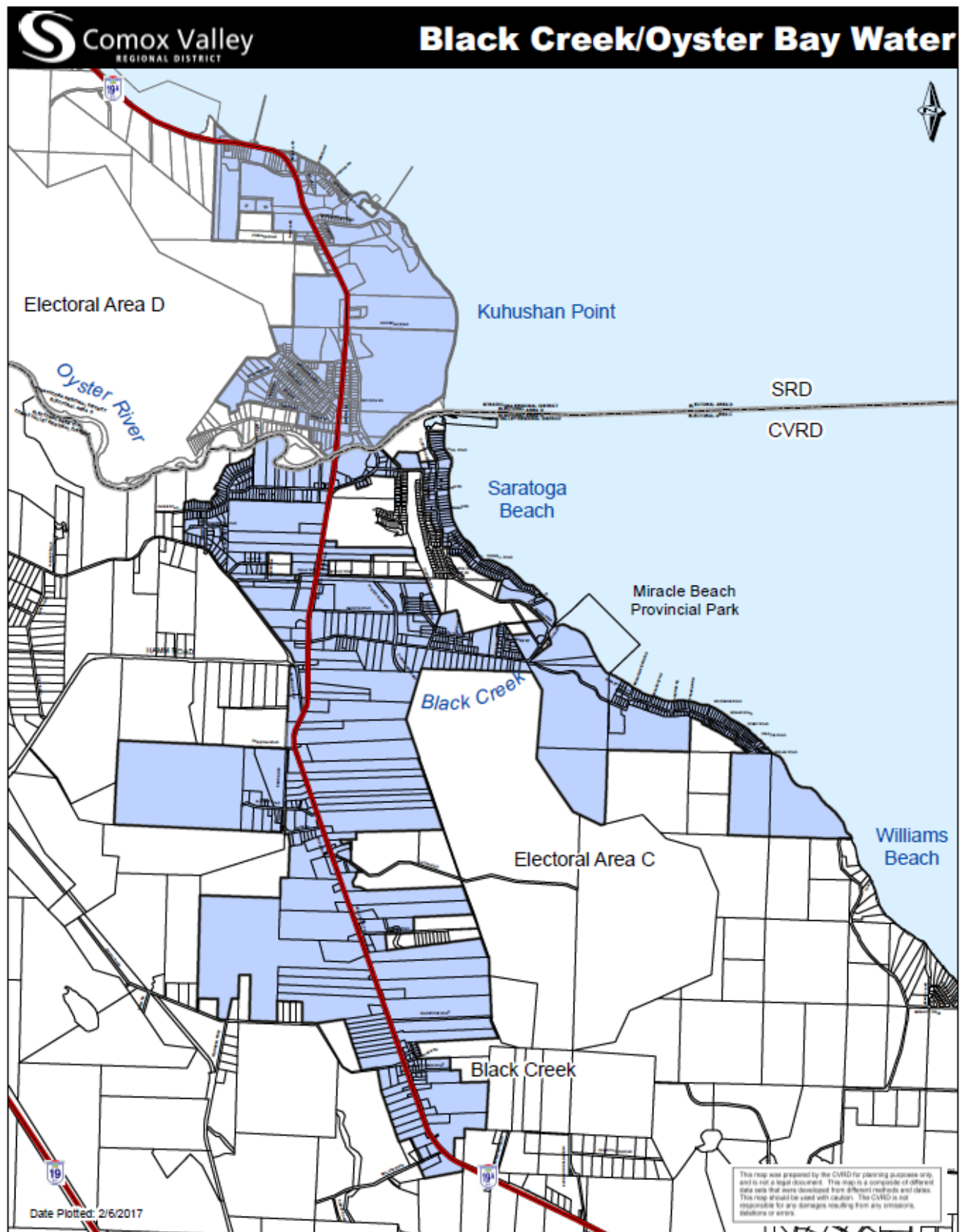
TABLE of CONTENTS

Map of Service Area	1
Introduction	2
Operations.....	2
Goals.....	3
Water Quality Summary.....	4
Canadian Drinking Water Guidelines.	6
Planning	8
Goals.....	8
Consumption	8
Maintenance	9
Financial	10
2017 Accomplishments.....	11
2018 Ojectives.....	11
Appendix A: Detailed Water Quality Information.....	12

“2017 was an exciting year for the BCOB Water System and included a successful grant application to the Clean Water and Wastewater Fund to help cover 83 per cent of the costs of construction of a new production well for the service”

-Mike Herschmiller, Manager of Water Services

Map of Service Area



Introduction

The Comox Valley Regional District (CVRD) strives to provide high quality drinking water to the Black Creek-Oyster Bay (BCOB) Service Area, through responsible operation, monitoring, and management of the water system. The CVRD is regulated by Island Health as part of the Ministry of Health for its activities as a potable water supplier. Under the *Drinking Water Protection Act* (DWP Act), the CVRD is required to report annually on water quality for the BCOB Drinking Water System. This report covers the period from January 1 to December 31, 2017 and includes information on water quality, consumption, maintenance and capital projects.

The BCOB Water Service provides domestic water to approximately 2,100 residents and 30 local businesses located in both the CVRD Electoral Area 'C' and the Strathcona Regional District Electoral Area 'D'. The service is owned and operated by the CVRD for the benefit of both regional districts and is funded through a combination of frontage tax and user rates.

The service consists of two groundwater supply wells and one surface water infiltration gallery adjacent to the Oyster River. The water treatment facility utilizes chlorination, pH control systems, a chlorine gas scrubber, ultraviolet light (UV) disinfection and emergency backup power. The system also includes one pump station and two reservoirs located on Macaulay and Kelland Road.



Figure No.1: Cleaning the UV bulb sleeves inside the BCOB Water Treatment Facility.

Operations

Goals

To provide high quality drinking water to all customers through efficient and effective disinfection and distribution operations.

Water Quality Summary

Parameter ¹	2016	2017	Target
Source Water			
Source Water Turbidity (average NTU)	0.05	0.04	<1.0
Source Water Temperature (Celsius)	12.0	14.7	15
Water Treatment			
Chlorine Dose (mg/L)	1.33	1.23	<2.0
Water pH Level (after adjustment)	7.10	7.25	7.0-8.5
Distribution System			
Chlorine residual-distribution system (mg/L)	0.81	0.81	>0.20
Total Coliforms (positive samples)	0	0	0
E.Coli (positive samples)	0	0	0
Trihalomethanes (mg/L)	0.003	0.012	<0.1

¹More information for each parameter is available later on in the report.

The Ministry of Health regulates municipal drinking water quality through the DWP Act and the *Drinking Water Protection Regulation* (the Regulation). The DWP Act and Regulation are administered by regional health authorities, and for the CVRD, the administering authority is Island Health. Both the DWP Act and Regulation set out certain requirements for drinking water operators and suppliers to ensure the provision of safe drinking water to their customers.

In the BCOB Water System, raw water enters the treatment facility and is treated using UV disinfection, chlorine for gas disinfection. When water is drawn from the groundwater wells, caustic soda is used for pH adjustment. Once the raw water is treated it proceeds into the distribution system, which consists of two reservoirs and one booster pump station. The CVRD takes weekly water quality samples of the source water and treated water at four fixed locations within the distribution system, to ensure that water is meeting provincial objectives. Quarterly testing for distribution by-products is taken from the Macaulay Road reservoir along with a water chemistry report being completed. A summary of water quality and a description of sampling results can be found below. For detailed water quality results refer to Appendix A.

Disinfection

All water supply systems governed by Island Health that are using surface water are required to adhere to provincial 4-3-2-1-0 surface water treatment objectives to ensure that the water treatment process is effectively killing disease causing viruses, bacteria and parasites. The 4-3-2-1-0 specifications are as follows:

- 4-log (99.99 per cent) removal/inactivation of viruses;
- 3-log (99.9 per cent) removal/inactivation of Giardia cysts and Cryptosporidium oocysts;
- 2 treatment processes, usually filtration and disinfection;
- 1 NTU turbidity (maximum) in finished water;
- No detectable E.Coli, fecal coliforms and total coliforms in treated water.



Figure No.2: Chlorine Injection within BCOB Treatment Facility

The system is fully compliant with Island Health's surface water treatment objectives and has obtained a filtration deferral permit for use of the Oyster River infiltration gallery. Water drawn from the river utilizes a two-step disinfection process for surface water, UV disinfection followed by chlorination. When water is being drawn out of groundwater wells caustic is also used to help raise the pH of the water.

By dosing the water with chlorine at the treatment plant a free chlorine residual is established throughout the distribution network to help prevent water from bacteriological regrowth and cross contamination during storage. The free chlorine residual is an indicator of the effectiveness of disinfection within the distribution system. The CVRD strives to maintain a free chlorine residual above 0.2mg/L at the end of the system. The CVRD regularly monitors the chlorine residual throughout the distribution network at four fixed locations. Figure No.3 below provides the average chlorine residual at the four new sampling kiosks.

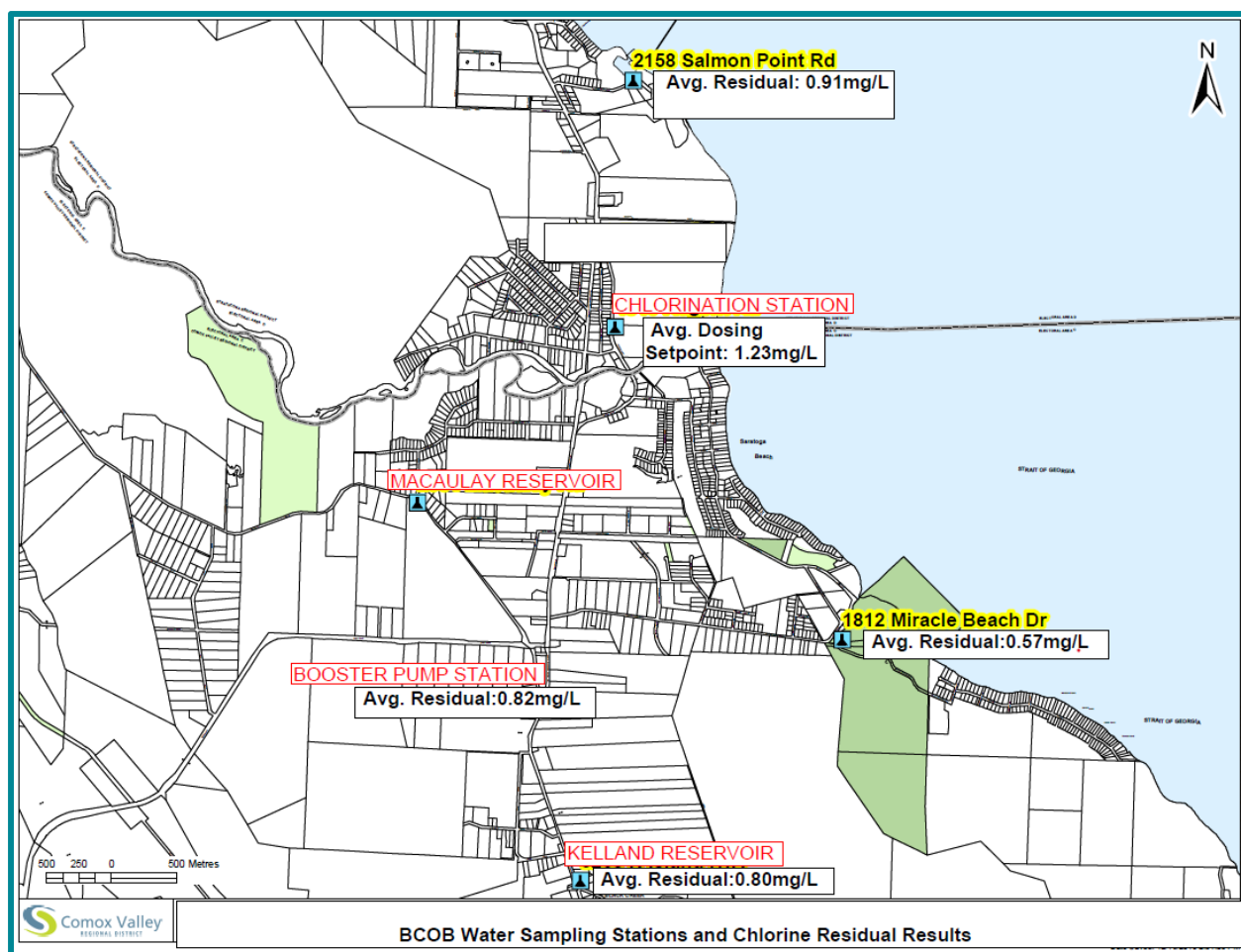


Figure No.3: Average Chlorine Residual at the BCOB Sampling Locations

A by-product of chlorination can be Trihalomethanes (THM). There are four types of THM's that contribute to total THM's. Chloroform is the most common THM and is formed when natural organic matter reacts with chlorine and/or bromine in disinfected water. The guidelines require that the total THM's for drinking water must be less than 0.1mg/L. Samples for THM's are taken quarterly at the Macaulay Road reservoir Table No.1 below shows the average THM's at the Macaulay reservoir.

Table No.1: Total THM Concentration at the Macaulay Road Reservoir

Trihalomethanes	Macaulay Reservoir
Chloroform	0.012
Bromodichloromethane	0.001
Dibromochloromethane	<0.001
Bromoform	<0.001
Average Total THMs (mg/L)	0.012

Bacteria

E.Coli and total coliform bacteria are microorganisms that if present in water samples indicate possible contamination with sewage or animal waste. Chlorination helps to remove harmful pathogens within the water supply network. Table No.2 below, shows that within the BCOB water distribution system for 2017, there were zero positive results found for E.Coli and total coliforms.

Table No.2: Bacteriological Standards and Sampling Results

Results	E.Coli		Total Coliform Bacteria	
	Exceedances ¹	# of Samples	Exceedances ²	# of Samples
January	0	8	0	8
February	0	6	0	6
March	0	5	0	5
April	0	8	0	8
May	0	8	0	8
June	0	8	0	8
July	0	10	0	10
August	0	6	0	6
September	0	8	0	8
October	0	8	0	8
November	0*	8	0*	8
December	0	6	0	6
Totals	0 exceedances per 89 samples		0 exceedances per 89 samples	

¹Standard-No detectable E.Coli per 100mL

²Standard-At least 90 per cent of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

*Two samples exceeded recommended sampling hold time, resample completed

Canadian Drinking Water Guidelines

Health Canada develops the *Canadian Drinking Water Guidelines*. These are guidelines for limits on microbial, chemical, physical and radiological substances in drinking water. In the guidelines, there are health-based limits on a substance maximum allowable concentration. The guidelines also assign aesthetic objectives to substances that do not cause risk to human health, but will influence consumer acceptance of the water based on factors such as taste, odour and colour. Samples are taken quarterly at the Macaulay Road reservoir, Table No.3 shows the average concentration for multiple parameters compared to the guideline concentrations. In 2017, the system was below all maximum allowable concentrations as illustrated in the Table No.3.

Table No.3: Chemical and Physical Parameters at Macaulay Reservoir Compared to Guideline Concentrations

Parameter	Macaulay Reservoir (mg/L)	Guideline Concentration (mg/L)
Aluminum	0.00362	≤ 0.1
Arsenic	< 0.0001	≤ 0.01
Barium	0.0011	≤ 1.0
Boron	0.017	≤ 5.0
Chloride	6.17	250
Chromium	0.000159	≤ 0.05
Copper	0.0011	1
Fluoride	0.022	≤ 1.5
Iron	0.009	≤ 0.30
Lead	0.00022	≤ 0.01
Manganese	< 0.001	≤ 0.05
Nitrite (as N)	< 0.01	10
Selenium	< 0.0002	≤ 0.05
Sodium	15.5	≤ 200
Sulfate (SO ₄)	2.3	≤ 500
Zinc	0.0013	≤ 5

Turbidity

The *Canadian Drinking Water Guidelines* also require the turbidity to be below 1 NTU. Turbidity is the measure of relative clarity of a liquid. Clarity is important when producing drinking water for human consumption. The average source water turbidity was 0.04 NTU.

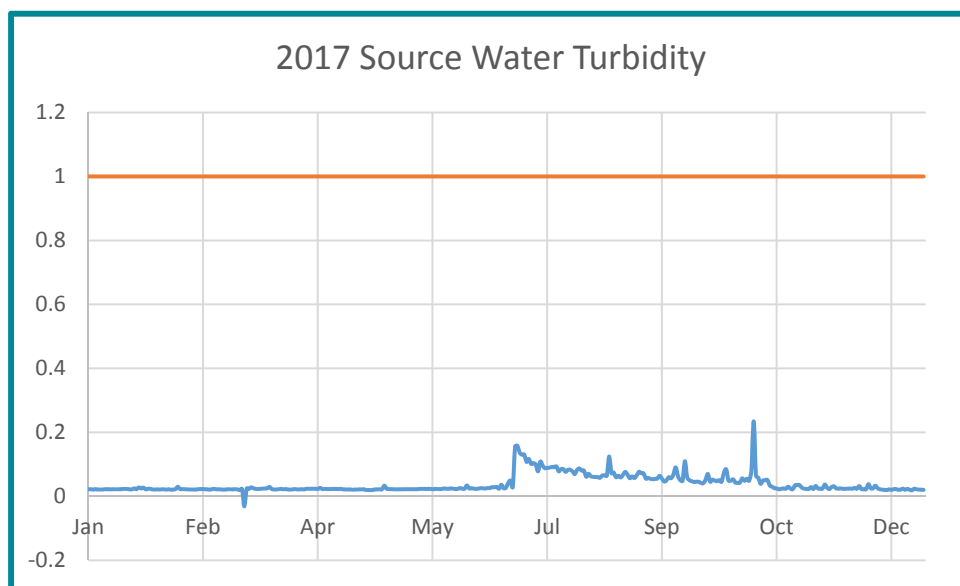


Figure No.4: Source Water Turbidity

Temperature

Temperature is described as an aesthetic objective (a parameter that may impair the taste, smell or colour of water) and physical characteristic of water. Gradual variations in water temperature occur throughout the seasons, however significant changes in water temperature can upset chlorination and chemical water treatment processes. The guidelines recommend water temperature to be less than 15°Celsius. The average temperature for the incoming source water was 14.7°Celsius and within the distribution was 13.6 °Celsius.

pH

The pH of water is a measure of water acidity. pH has minimal impact for water consumers and varies greatly depending on the water source. However, pH is very important for many operational water quality parameters. The *Canadian Drinking Water Guidelines* recommend the pH ranging between 6.5-8.5. In 2017, the average pH of the source water was 6.89 and the average pH within the distribution system was 7.25.

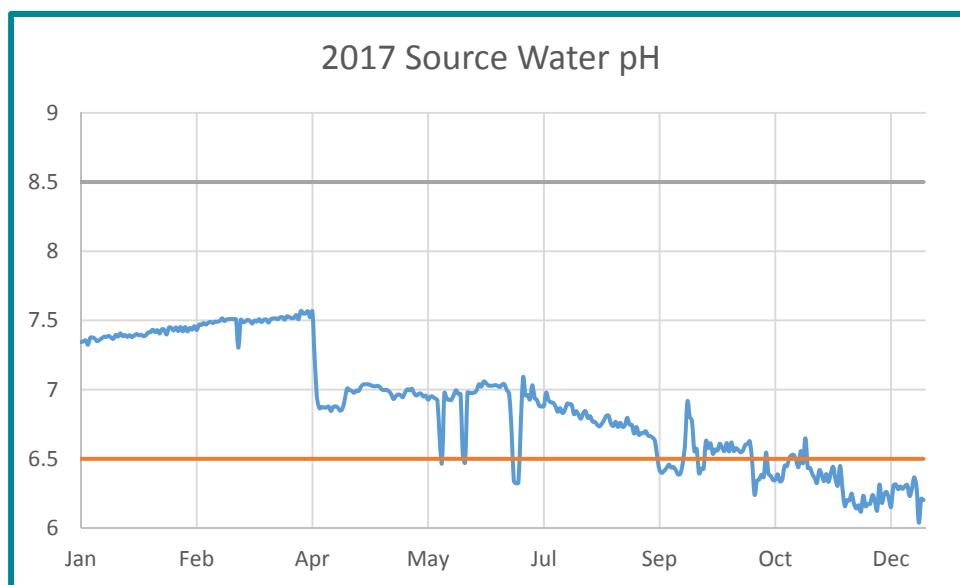


Figure No.5: Source Water pH

Planning

Goals

To ensure effective long-term planning and management programs are in place to meet the needs of all users groups while minimizing operation and infrastructure costs.

Consumption

The average daily water consumption for the system is 1047m³/day. For the BCOB Water System, surface water and groundwater sources are typically rotated seasonally depending on turbidity and system demand. In 2017, no watering restrictions were implemented for the BCOB Water System. However it can be seen that during the summer months water consumption is increasing approximately two fold from the average day demand, as shown in the Figure No.6 below. The maximum day demand was 2,080m³ and occurred on July 30, 2017.

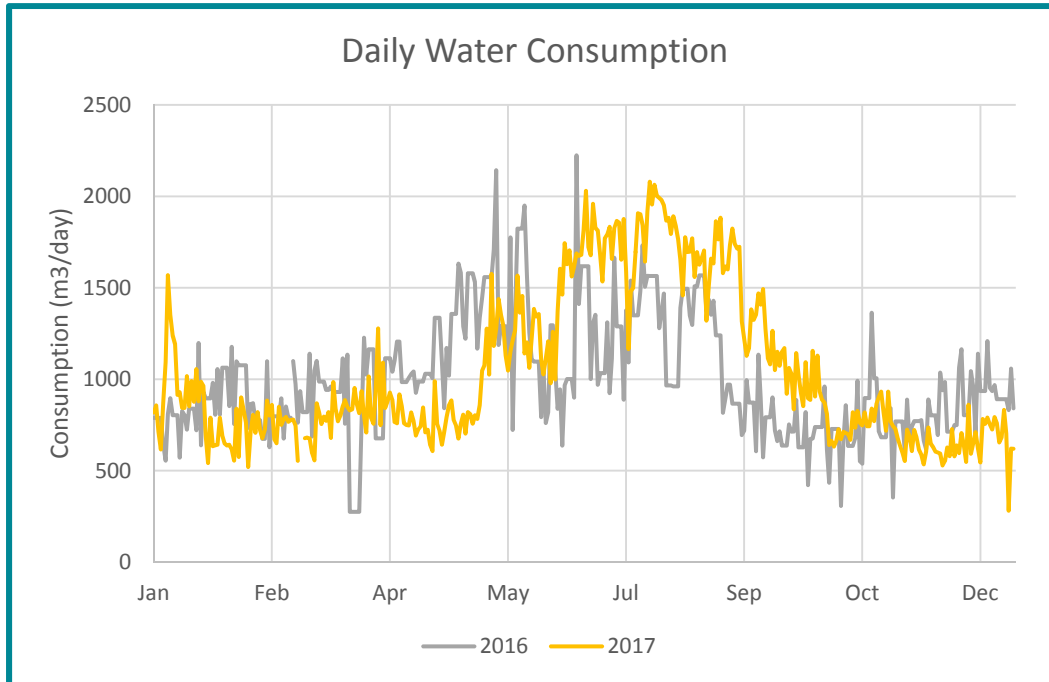


Figure No.6: Daily Water Consumption in BCOB for 2016 and 2017

Maintenance

The BCOB Water System is owned and operated by the CVRD. The water services staff consists of eight operators with varying ranges of certification. Each operator is registered with the

environmental operator's certification program within BC and is required to remain in good standing by taking yearly continuing education courses.

The CVRD carries out regular and routine maintenance of the entire BCOB Water System, to ensure continued operation and supply of safe and clean water to all users. The treatment facility, wells, distribution lines and reservoirs are regularly inspected and maintained.

Every service request within the system is investigated by CVRD Waterworks Operations Staff and appropriate action is taken. Figure No.7 identifies the various types of service requests received by waterworks staff.

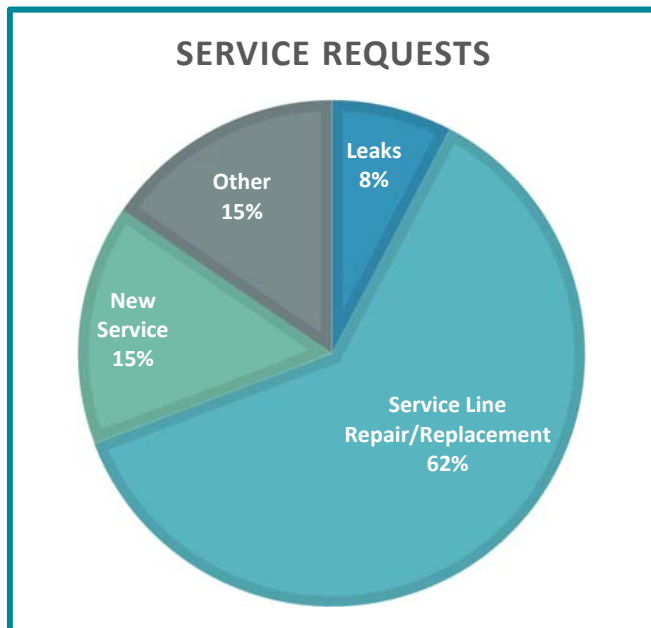


Figure No.7: Service Requests by Category

Financial

In 2017, the CVRD treated a total of 378,511m³ of water. An increase in the water rates occurred in April 2017, the new rates reduced the volumetric threshold to promote water conservation and minimize increases to tiered water rates. One of the primary reasons for the water rate increase is the CVRD is investing in infrastructure replacement, which will help to avoid expenses associated with system failures in the future. Investing in infrastructure now will reduce additional costs associated with recurring main breaks and will result in reduced inconveniences in the future.

An application to the Clean Water and Wastewater Fund (CWWF) was submitted in 2016 for grant funding for the installation of a new water supply well for the system. The CVRD was informed in spring 2017 that the application was successful. The project is 83 per cent funded by the CWWF and work is underway with the installation of a test well being completed in 2017. Following the results and information gathered from the test well, the CVRD will be proceeding with the drilling, engineering and construction of a new production well in 2018. The new well will help to alleviate capacity concerns for the system in the dry summer months.

The Watutco Water System feasibility study was continued in 2017 results are expected early spring 2018. Next steps and a recommended course of action will be presented as part of the feasibility study work.

Procurement of a consultant to develop a detailed asset management plan for the service was completed in 2017. The plan is expected to be complete by the end of 2018 and will include development of an asset inventory, review of the condition of current infrastructure required levels of service and long term asset replacement requirements. Water rates will be reviewed as part of this work to ensure sufficient revenue is being collected to help fund future upgrades.

2017 Accomplishments

- ✓ Successful application to the Clean Water and Wastewater Fund for a new production well.
- ✓ Installation of a new test well.
- ✓ Procurement of a drilling and engineering firm to complete the drilling and engineering for the new production well.
- ✓ Commencement of work to complete a detailed asset management plan for the service.
- ✓ Registered groundwater wells with BC Ministry of Environment.

2018 Objectives

- Replace a watermain along Miracle Beach Road.
- Complete an assessment of the Oyster River infiltration gallery.
- Complete the detailed asset management plan for the service.
- Complete the design and construction of the new production well project.
- Complete the Watutco Water System feasibility study.
- Install new meters along highway to improve meter-reading efficiency and operator safety.



Figure No.8: Drilling of Test Well

Appendix A

[illegible]

Date	SOURCE WATER				DISTRIBUTION SYSTEM														
					Chlorine Residuals (mg/L)								E.Coli				Total Coliforms		
	Total Water Consumption (m3)	Temp (°C)	Turbidity (NTU)	pH	Calculated Chlorine Dose	Kelland Reservoir	8527 Island Hwy	1812 Miracle Beach	2220 Salmon Pt Rd	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	
16-Mar	820	8.7	0.02	7.48	1.12														
17-Mar	679	8.7	0.02	7.50	1.11	0.77													
18-Mar	985		0.02	7.49															
19-Mar	840		0.02	7.51															
20-Mar	770	8.4	0.03	7.49	1.25	0.71								<1				<1	
21-Mar	801	8.6	0.03	7.50	1.43	0.81													
22-Mar	851	8.9	0.02	7.51	1.44	0.85													
23-Mar	885	9	0.02	7.48	1.28	0.82													
24-Mar	849	9.1	0.02	7.51	1.46	0.70													
25-Mar	829		0.02	7.51															
26-Mar	835		0.02	7.51															
27-Mar	952	9.1	0.02	7.51	1.33	0.80								<1				<1	
28-Mar	862		0.02	7.52															
29-Mar	814	9	0.02	7.52	1.25														
30-Mar	934	9.1	0.02	7.51	1.22	0.74													
31-Mar	798	9	0.02	7.53	1.25	0.86													
01-Apr	709		0.02	7.52															
02-Apr	1015		0.02	7.52															
03-Apr	788	9	0.02	7.52	1.38			1.2	0.9		<1	<1			<1	<1			
04-Apr	756	9.4	0.02	7.54	1.46														
05-Apr	938	9.5	0.02	7.51	1.49	0.78													
06-Apr	1277	9.4	0.02	7.57	1.5														
07-Apr	749	9.5	0.02	7.55	1.55	0.87													
08-Apr	1091		0.02	7.55															
09-Apr	843		0.02	7.57															
10-Apr	878	9.6	0.02	7.52	1.3	0.72							<1	<1			<1	<1	
11-Apr	926	9.2	0.02	7.56	1.23	0.87													
12-Apr	888		0.03	7.21	1.57														
13-Apr	766	14.2	0.02	6.93	1.64														
14-Apr	759		0.02	6.87															
15-Apr	917		0.02	6.87															
16-Apr	851		0.02	6.87															
17-Apr	760		0.02	6.87															
18-Apr	749	14.9	0.02	6.88	1.38	0.84					<1	<1			<1	<1			
19-Apr	747	15	0.02	6.85	1.19														
20-Apr	818	14.7	0.02	6.87	0.97	0.90													
21-Apr	772	15	0.02	6.88	1.33	0.73													
22-Apr	692		0.02	6.87															
23-Apr	725		0.02	6.85															
24-Apr	742	14.9	0.02	6.86	1.18	0.78							<1	<1			<1	<1	
25-Apr	845	14.7	0.02	6.93	1.09														
26-Apr	709	15.2	0.02	7.01	1.35	0.75													
27-Apr	724	14.8	0.02	7.00	1.28														
28-Apr	641	14.8	0.02	6.99	1.32	0.70													
29-Apr	607		0.02	6.98		0.76													
30-Apr	989		0.02	6.99		0.63													
01-May	757	14.8	0.02	6.99	1.43			0.89	1.09		<1	<1			<1	<1			
02-May	717	15	0.02	7.02	1.58														
03-May	643	15.1	0.02	7.04	1.49														
04-May	712	15.1	0.02	7.04	1.39	0.15													
05-May	793	15.4	0.02	7.04	1.07	0.75													
06-May	857		0.02	7.03															
07-May	884		0.02	7.03															
08-May	778	15.3	0.02	7.02	1.35		1.09						<1	<1			<1	<1	
09-May	746	14.9	0.02	7.03															
10-May	676	15.4	0.03	7.02	1.37														
11-May	756	15.4	0.02	7.00	1.63	0.40													
12-May	806		0.02	7.00	1.43	0.53													
13-May	702		0.02	7.00															
14-May	820		0.02	6.99							<1	<1			<1	<1			
15-May	808	15.1	0.02	6.97	1.35	0.79		0.45	1.1										
16-May	757	15	0.02	6.93	1.55	0.04													
17-May	802	15.4	0.02	6.95	1.06														
18-May	783	15.8	0.02	6.96	1.41														
19-May	858	15.6	0.02	6.96	0.95	0.45													
20-May	1046		0.02	6.94															
21-May	1074		0.02	6.98															
22-May	1276		0.02	7.00															
23-May	1025	16.7	0.02	6.99	1.01	0.23	1.01						<1	<1			<1	<1	
24-May	1576	16.2	0.02	7.01	1.06														
25-May	1182	16.2	0.02	6.97	1.55														
26-May	1277	16.2	0.02	6.96	1.33														
27-May	1439		0.02	6.97															
28-May	1352		0.02	6.97															

Date	SOURCE WATER				DISTRIBUTION SYSTEM														
					Chlorine Residuals (mg/L)							E.Coli					Total Coliforms		
	Total Water Consumption (m3)	Temp (°C)	Turbidity (NTU)	pH	Calculated Chlorine Dose	Kelland Reservoir	8527 Island Hwy	1812 Miracle Beach	2220 Salmon Pt Rd	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	
29-May	1295	16.5	0.02	6.95	1.1-1.41														
30-May	1129	16.8	0.02	6.96	1.44														
31-May	1047	16.4	0.02	6.93	1.63	1.08													
01-Jun	1151	16.4	0.02	6.95	1.6	1.26													
02-Jun	1213	16.4	0.02	6.95	1.51	1.26													
03-Jun	1267		0.02	6.94							<1	<1			<1	<1			
04-Jun	1566		0.02	6.92															
05-Jun	1364	16.5	0.02	6.64	1.42	1.45		0.53	1.19										
06-Jun	1455	16.8	0.02	6.48	1.53	1.45													
07-Jun	1141		0.02	6.97		1.35													
08-Jun	1201	17	0.02	6.93	1.52	1.42													
09-Jun	1062	16.1	0.02	6.93	1.54	1.44													
10-Jun	1225		0.02	6.92															
11-Jun	1384		0.02	6.96															
12-Jun	1343	16.9	0.03	6.99	1.51	1.28							<1	<1			<1	<1	
13-Jun	1356	16.9	0.02	6.97	1.46														
14-Jun	1107		0.02	6.97															
15-Jun	1026	16.3	0.03	6.52	1.24	1.20													
16-Jun	1112	16.2	0.02	6.48	1.04	0.99													
17-Jun	1207		0.03	6.98															
18-Jun	978		0.02	6.97							<1	<1			<1	<1			
19-Jun	1259	16.5	0.02	6.98	1.18	1.08													
20-Jun	998	16.5	0.02	6.98	1.09														
21-Jun	1371	17	0.03	7.00	1.15														
22-Jun	1604	16.9	0.03	7.04	1.02														
23-Jun	1463	16.9	0.02	7.02	1.06	1.06													
24-Jun	1743		0.03	7.06															
25-Jun	1629		0.03	7.05															
26-Jun	1705	17.5	0.03	7.03	1.1	1.13							<1	<1			<1	<1	
27-Jun	1562	17.3	0.03	7.03	1.04	1.05													
28-Jun	1617	17.3	0.03	7.03	1.16	0.97													
29-Jun	1687	17.2	0.02	7.03	1.08	1.18													
30-Jun	1675	17.5	0.04	7.03	1.1	1.20													
01-Jul	1681		0.03	7.02															
02-Jul	1813		0.03	7.04															
03-Jul	2030		0.04	7.04															
04-Jul	1724	17.5	0.05	7.00	1.15														
05-Jul	1678	17.6	0.03	6.97	1.02	1.06					<1	<1	1.22	<1		<1	<1		
06-Jul	1959	20	0.16	6.72	1.16	1.06													
07-Jul	1827	20.6	0.16	6.34	1.07														
08-Jul	1813		0.14	6.32															
09-Jul	1678		0.13	6.33															
10-Jul	1535	20.5	0.13	6.73	1.13	0.96	0.67							<1	<1		<1	<1	
11-Jul	1771	20.1	0.11	7.09	2.19	0.88													
12-Jul	1792	23	0.12	6.96	1.13	0.88													
13-Jul	1833	20.2	0.10	6.96	1.17	0.87													
14-Jul	1658	20.3	0.10	6.93	1.09	0.82													
15-Jul	1826		0.10	7.03															
16-Jul	1866		0.08	6.94							<1	<1			<1	<1			
17-Jul	1856	20.3	0.11	6.92	1.14	0.73		0.23	0.77										
18-Jul	1654	20.3	0.10	6.88	1.16	0.73													
19-Jul	1876	20.3	0.09	6.88	0.99	0.78													
20-Jul	1589	20.7	0.09	6.88	1.13														
21-Jul	1165	20.2	0.09	6.98	1.18	0.71													
22-Jul	1481		0.09	6.92															
23-Jul	1499		0.09	6.91															
24-Jul	1696	20.2	0.09	6.90	1.17	0.57	0.56							<1	<1		<1	<1	
25-Jul	1907	20.5	0.08	6.88	1.06														
26-Jul	1902	21.1	0.08	6.84	0.91	0.53													
27-Jul	1843	21.2	0.09	6.87	1.01														
28-Jul	1643	21.2	0.08	6.83	1.11														
29-Jul	1917		0.08	6.85															
30-Jul	2080		0.08	6.80															
31-Jul	1955	21.9	0.08	6.89	1.07	0.66		0.41	0.8		<1	<1			<1	<1			
01-Aug	2063	22.5	0.07	6.89	1	0.78													
02-Aug	2003	22.9	0.08	6.82	0.36	0.70													
03-Aug	1991	23.1	0.09	6.84	0.32	0.82													
04-Aug	1980	23	0.08	6.82	1.14														
05-Aug	1951		0.08	6.79															
06-Aug	1867		0.06	6.83															
07-Aug	1882		0.07	6.84															
08-Aug	1794	22.1	0.06	6.80	1.18	0.71	0.52							<1	<1		<1	<1	
09-Aug	1891	22.4	0.06	6.81	1.16	0.86													
10-Aug	1838	22.4	0.06	6.77	1.18	0.84													

Date	SOURCE WATER				DISTRIBUTION SYSTEM														
					Chlorine Residuals (mg/L)							E.Coli					Total Coliforms		
	Total Water Consumption (m3)	Temp (°C)	Turbidity (NTU)	pH	Calculated Chlorine Dose	Kelland Reservoir	8527 Island Hwy	1812 Miracle Beach	2220 Salmon Pt Rd	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	
11-Aug	1766	22.1	0.06	6.77	1.14	0.90													
12-Aug	1653	21.6	0.06	6.75	1.18														
13-Aug	1459		0.06	6.73															
14-Aug	1776		0.07	6.75				0.46	0.86		<1	<1			<1	<1			
15-Aug	1696	21.3	0.06	6.78	1.15	0.86													
16-Aug	1698		0.12	6.81	1.14														
17-Aug	1770	21.7	0.07	6.81	1.16	0.46													
18-Aug	1559	21.9	0.07	6.75		0.70													
19-Aug	1695		0.06	6.74															
20-Aug	1626		0.06	6.77															
21-Aug	1662	22	0.06	6.73	1.09	0.83	0.54						<1				<1		
22-Aug	1703	21.9	0.07	6.76	1.16	0.78													
23-Aug	1320	22	0.08	6.73	1.06	0.78													
24-Aug	1513	21.7	0.07	6.74	1.27	0.72													
25-Aug	1659	21.6	0.06	6.80	1.2	0.68													
26-Aug	1633		0.06	6.75															
27-Aug	1864		0.06	6.74															
28-Aug	1765	21.9	0.07	6.68	1.13	0.68		0.36			<1				<1				
29-Aug	1883	22	0.08	6.73	1.13														
30-Aug	1580	21.1	0.07	6.67	1.15	0.84													
31-Aug	1616	21.6	0.07	6.69	1.07	0.75													
01-Sep	1600	21.7	0.06	6.68	1.21	0.70													
02-Sep	1733		0.06	6.70															
03-Sep	1824		0.05	6.67															
04-Sep	1740		0.05	6.66															
05-Sep	1714	23.5	0.05	6.65	1.11	0.76		0.46	0.86		<1	<1			<1	<1			
06-Sep	1723		0.06	6.63															
07-Sep	1316	22.3	0.06	6.51	1.01														
08-Sep	1221	21.8	0.06	6.42	1.4	0.59													
09-Sep	1128		0.05	6.40															
10-Sep	1168		0.05	6.41															
11-Sep	1382		0.06	6.43			0.72						<1	<1			<1	<1	
12-Sep	1324		0.06	6.46															
13-Sep	1353		0.07	6.44	1.22														
14-Sep	1469	20.2	0.09	6.44	1.1	0.86													
15-Sep	1408	19.7	0.06	6.42	1.33	0.62													
16-Sep	1492		0.05	6.39															
17-Sep	1275		0.05	6.39															
18-Sep	1114	17.4	0.11	6.47	1.32			0.5	0.75		<1	<1			<1	<1			
19-Sep	1081	18.6	0.06	6.61	1.09	0.61													
20-Sep	1264	17.9	0.05	6.91	1.3														
21-Sep	1050		0.05	6.80															
22-Sep	1149	17.6	0.04	6.77	1.35														
23-Sep	1074		0.05	6.56															
24-Sep	1150		0.05	6.57															
25-Sep	1170	18.8	0.04	6.40	1.28	0.46	0.7						<1	<1			<1	<1	
26-Sep	921		0.04	6.43															
27-Sep	1061	18.7	0.05	6.43	1.38	0.49													
28-Sep	1030	18.3	0.07	6.63	1.64														
29-Sep	835	18.5	0.05	6.58	1.3														
30-Sep	1143		0.05	6.61															
01-Oct	1029		0.05	6.54															
02-Oct	928		0.05	6.57															
03-Oct	853	16.6	0.05	6.56	1.4	0.46		0.47	0.98		<1	<1			<1	<1			
04-Oct	1093	16.2	0.05	6.61	1.56	0.47													
05-Oct	896	15.3	0.07	6.58	1.41	0.47													
06-Oct	887	15.5	0.08	6.56	1.48	0.47													
07-Oct	1155		0.05	6.61															
08-Oct	906		0.05	6.55															
09-Oct	1128		0.05	6.62			0.94												
10-Oct	933	15.9	0.04	6.56	1.35	0.49							<1	<1			<1	<1	
11-Oct	887	15.3	0.04	6.58	1.43	0.51													
12-Oct	871	15.5	0.04	6.56	1.42	0.47													
13-Oct	810	14.9	0.06	6.55	1.23	0.52													
14-Oct	640		0.05	6.56															
15-Oct	662		0.05	6.60															
16-Oct	632	15	0.05	6.61	1.53	0.51		0.44	1.03		<1	<1			<1	<1			
17-Oct	663	15.4	0.08	6.62	1.59	0.51													
18-Oct	726	15.2	0.23	6.48	1.58														
19-Oct	672	14.2	0.07	6.24	1.16	0.51													
20-Oct	712	14.3	0.06	6.34	1.02														
21-Oct	705		0.04	6.35															
22-Oct	700		0.05	6.38															
23-Oct	668	14.7	0.05	6.37	0.95		0.87						<1	<1			<1	<1	

Date	SOURCE WATER				DISTRIBUTION SYSTEM														
					Chlorine Residuals (mg/L)							E.Coli					Total Coliforms		
	Total Water Consumption (m3)	Temp (°C)	Turbidity (NTU)	pH	Calculated Chlorine Dose	Kelland Reservoir	8527 Island Hwy	1812 Miracle Beach	2220 Salmon Pt Rd	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	1812 Miracle Beach	2220 Salmon Pt Rd	8527 Island Hwy	2315 King Road	
24-Oct	819	14.7	0.05	6.54	0.91														
25-Oct	735	14.9	0.03	6.39	1.3														
26-Oct	826	14.9	0.03	6.38	1.26														
27-Oct	761	14.5	0.03	6.35	1.14														
28-Oct	747		0.02	6.35															
29-Oct	818		0.02	6.39															
30-Oct	743	14	0.02	6.34	1														
31-Oct	743		0.02	6.35															
01-Nov	839	14.2	0.02	6.45	1.18														
02-Nov	771	14.2	0.03	6.45	1.06														
03-Nov	866	13.1	0.02	6.50	1.08														
04-Nov	902		0.02	6.53															
05-Nov	932		0.03	6.53															
06-Nov	818	12.2	0.04	6.49	1.14	0.52		0.49	0.73		<1	<1			<1	<1			
07-Nov	718	12.5	0.03	6.44	1.1	0.51													
08-Nov	932	12.5	0.03	6.56	2.21														
09-Nov	769	12.5	0.02	6.47	0.29														
10-Nov	745	13.5	0.02	6.65	0.76	0.58													
11-Nov	727		0.02	6.44															
12-Nov	677		0.03	6.43															
13-Nov	636		0.02	6.39															
14-Nov	598	13.7	0.03	6.36	0.77	0.62	0.85						T	T			T	T	
15-Nov	553	13.4	0.02	6.33	1.52	0.69													
16-Nov	724	13.5	0.02	6.42	1.31														
17-Nov	690	13.5	0.02	6.39	0.95														
18-Nov	607		0.04	6.34															
19-Nov	722		0.03	6.39															
20-Nov	684	13.7	0.02	6.33	1.18	0.65		0.73	0.96		<1	<1			<1	<1			
21-Nov	615	13.6	0.03	6.40	1.43														
22-Nov	587	13.4	0.03	6.44	1.33	0.73													
23-Nov	534		0.02	6.35															
24-Nov	605	13.8	0.02	6.31	1.2														
25-Nov	736		0.02	6.45															
26-Nov	647		0.02	6.28															
27-Nov	628	12.9	0.02	6.16	1.15	0.71	0.84						<1	<1			<1	<1	
28-Nov	603	13.5	0.02	6.20	1.31														
29-Nov	600	14.4	0.02	6.20	1.11														
30-Nov	593	14.1	0.02	6.25	1.15	0.82													
01-Dec	528	14.2	0.03	6.17	1.27	0.82													
02-Dec	553		0.02	6.14															
03-Dec	627		0.03	6.16		0.83													
04-Dec	579	14.2	0.02	6.12	1.06			0.51	0.75		<1	<1			<1	<1			
05-Dec	727	15	0.02	6.23	1.03														
06-Dec	578	14.5	0.02	6.16	1.35														
07-Dec	638	14.3	0.04	6.18	1.45														
08-Dec	596		0.03	6.18															
09-Dec	705		0.02	6.24															
10-Dec	637		0.03	6.20															
11-Dec	548		0.03	6.13			0.8			0.97			<1	<1			<1	<1	
12-Dec	860	14.4	0.02	6.31	1.18	0.91													
13-Dec	592	14.4	0.02	6.18	1.01														
14-Dec	653	13.9	0.02	6.24	1.25	0.90													
15-Dec	710	14.7	0.02	6.26	1.28	0.87													
16-Dec	621		0.02	6.22															
17-Dec	545		0.02	6.15															
18-Dec	782	14.3	0.02	6.30	1.22	0.81		0.7	0.73		<1	<1			<1	<1			
19-Dec	756	14.2	0.02	6.32	1.55														
20-Dec	790	14.2	0.02	6.28	0.95														
21-Dec	754		0.02	6.30															
22-Dec	725	14.2	0.02	6.28	1.17	0.75													
23-Dec	793		0.02	6.30															
24-Dec	761		0.02	6.31															
25-Dec	655		0.02	6.23															
26-Dec	682		0.02	6.28															
27-Dec	832	14	0.02	6.37	1.24		0.96			0.92									
28-Dec	703		0.02	6.30															
29-Dec	281	14.1	0.02	6.04	1.29														
30-Dec	620		0.02	6.21															
31-Dec	620		0.02	6.20															
Count	363	222	365	365	222	144.00	18	20	19	2	24	24	23	18	24	24	23	18	
Average	1047	14.7	0.04	6.89	1.23	0.80	0.82	0.57	0.91	0.95	*T: sample exceeded hold time for delivery								