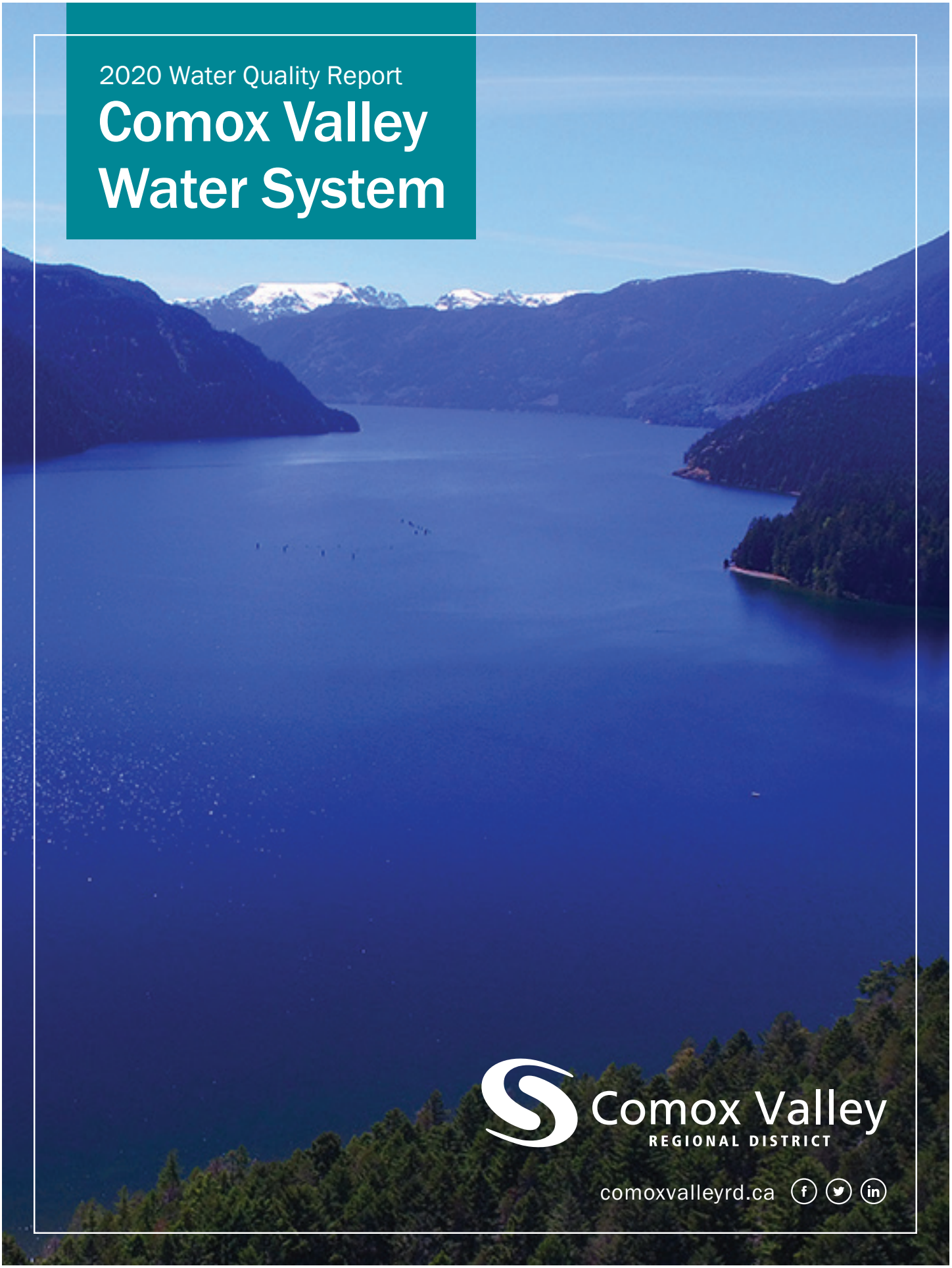
2020 Water Quality Report

Comox Valley Water System



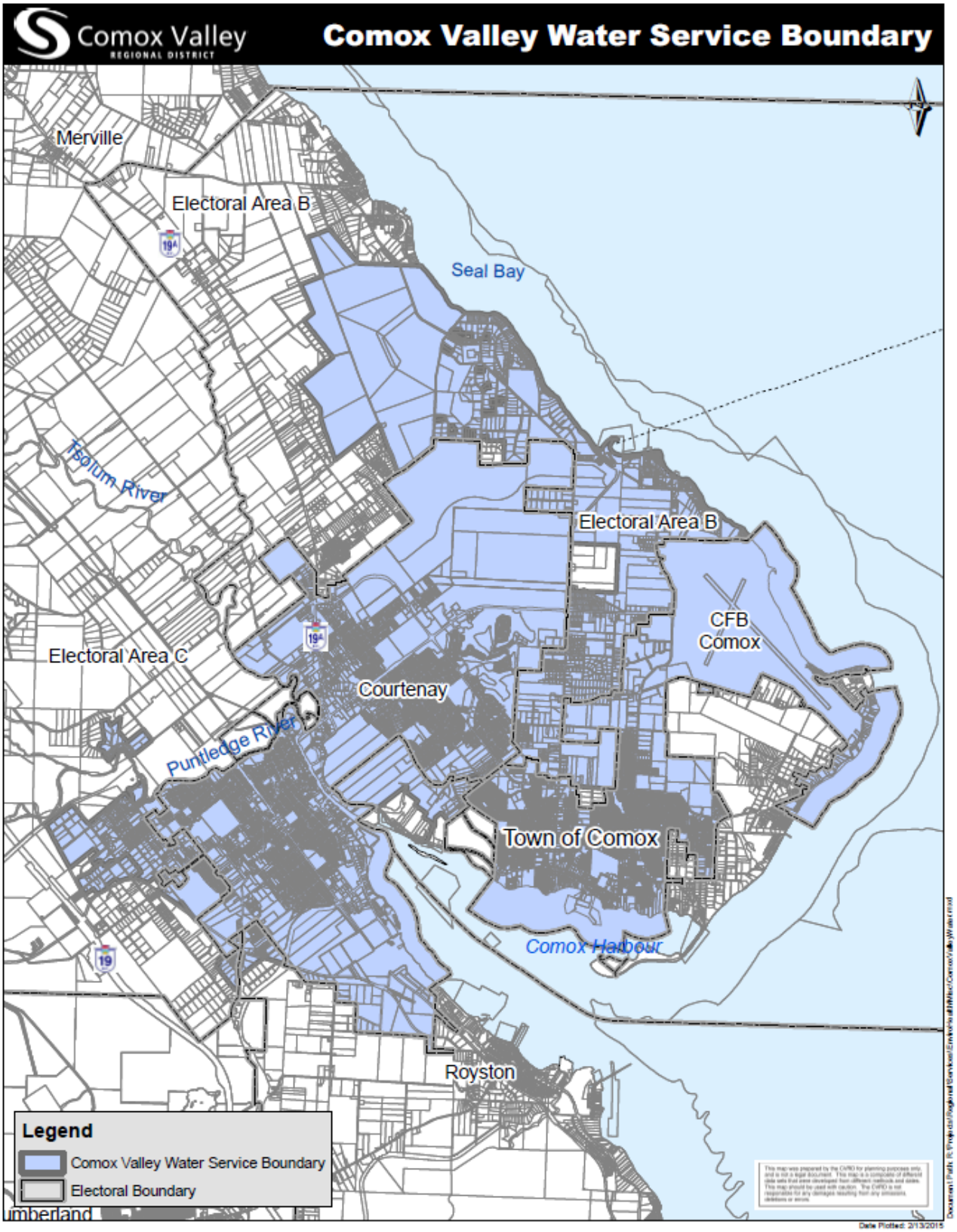
Comox Valley
REGIONAL DISTRICT

comoxvalleyrd.ca

TABLE of CONTENTS

Map of Service Area **1**
Introduction **2**
Operations **2**
Goals 2
Water Quality Summary 2
Water Quality Concerns 8
Planning **9**
Goals 9
Consumption 9
Maintenance 11
Financial 11
2020 Accomplishments **13**
2021 Objectives **13**
Appendix A: Parameter Details **15**

Map of Service Area



Introduction

The Comox Valley Regional District (CVRD) strives to provide high quality drinking water to the Comox Valley Water 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 the Comox Valley Water System (CVWS). This report covers the period from January 1 to December 31, 2020 and includes information on water quality, consumption, maintenance and capital projects.

The CVRD owns and operates the CVWS that provides domestic water to approximately 50,000 residents, including supplying bulk water to the Town of Comox, the City of Courtenay and to K'ómoks First Nation. The system also provides water and system maintenance to the Comox Valley Water Local Service Areas (WLSA).

Figure No.1: Pump Station

Water for the CVWS is sourced from Comox Lake and collected from the Puntledge River via BC Hydro's penstock. Water travels through two pipes to the CVRD's chlorination station where it is metered, sampled and disinfected before entering the distribution system. The system utilizes 33.6km of pipe, four pump stations (see Figure No.1) and six reservoirs with ability to store a combined volume of 31 million litres.

Operations

Goals

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

Water Quality Summary

Parameter[1]	2019	2020	Target
Source Water			
Chlorine Dosing Set Point (mg/L)	1.41	1.47	<2.0
Trihalomethanes (mg/L)	0.030	0.030	<0.1
Distribution System			
Chlorine Residual-Distribution System (mg/L)	0.84	0.87	>0.2
Total Coliforms (Positive Samples)	1	0	0
E.Coli (Positive Samples)	0	0	0
Canadian Drinking Water Quality Guidelines			
Source Water Turbidity (Average Nephelometric Turbidity Unit (NTU))	0.29	0.36	<1.0
Source Water Temperature (Celsius)	13.9	14.3	15.0
Source Water pH Levels	6.90	6.90	7.0-8.5

[1]More 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.

The CVRD manages the CVWS which includes supplying bulk water to the City of Courtenay, the Town of Comox and K'ómoks First Nation as well as providing and managing water for the Comox Valley WLSA. The CVRD takes weekly water quality samples at six reservoirs and within the distribution system, to ensure that water is meeting provincial objectives. Sampling for distribution by-products and water chemistry reports occurs quarterly. A summary of water quality and a description of sampling results can be found below.

Disinfection

The CVWS utilizes surface water that is sourced from Comox Lake. All water supply systems using surface water are governed by Island Health and are required to adhere to provincial 4-3-2-1-0 surface water treatment objectives to ensure effective elimination of disease causing viruses, bacteria and parasites. The 4-3-2-1-0 objectives 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.

Water from Comox Lake enters the chlorination station via the Puntledge River and is treated before being distributed throughout the system. The system currently does not filter incoming source water and is mandated by Island Health to construct a water filtration plant. A water filtration plant will remove suspended particles within the source water, ultimately eliminating boil water notices related to turbidity. This work was initiated in 2015, construction of the plant began in 2019 with commissioning scheduled for 2021.

Installation of temporary Ultraviolet Light (UV) disinfection at the existing chlorination station was completed in 2018. This is an interim measure to help reduce the number of boil water notices experienced prior to completion of the water treatment plant. The CVRD currently treats water with chlorine and UV disinfection.

Figure No.2: Inspection of UV Equipment

By dosing the water with chlorine at the chlorination station, a free chlorine residual is established throughout the distribution network to help prevent water from bacteriological regrowth. The CVRD strives to achieve a free chlorine residual of 0.3 to 0.5mg/L at the end of the system. In 2020 the average residual throughout the whole system was 0.87mg/L and at the end of the system the residual was 0.71mg/L, meeting Island Health's minimum requirement of 0.2mg/L. Figure No.3 below shows the average free chlorine residual at each reservoir.

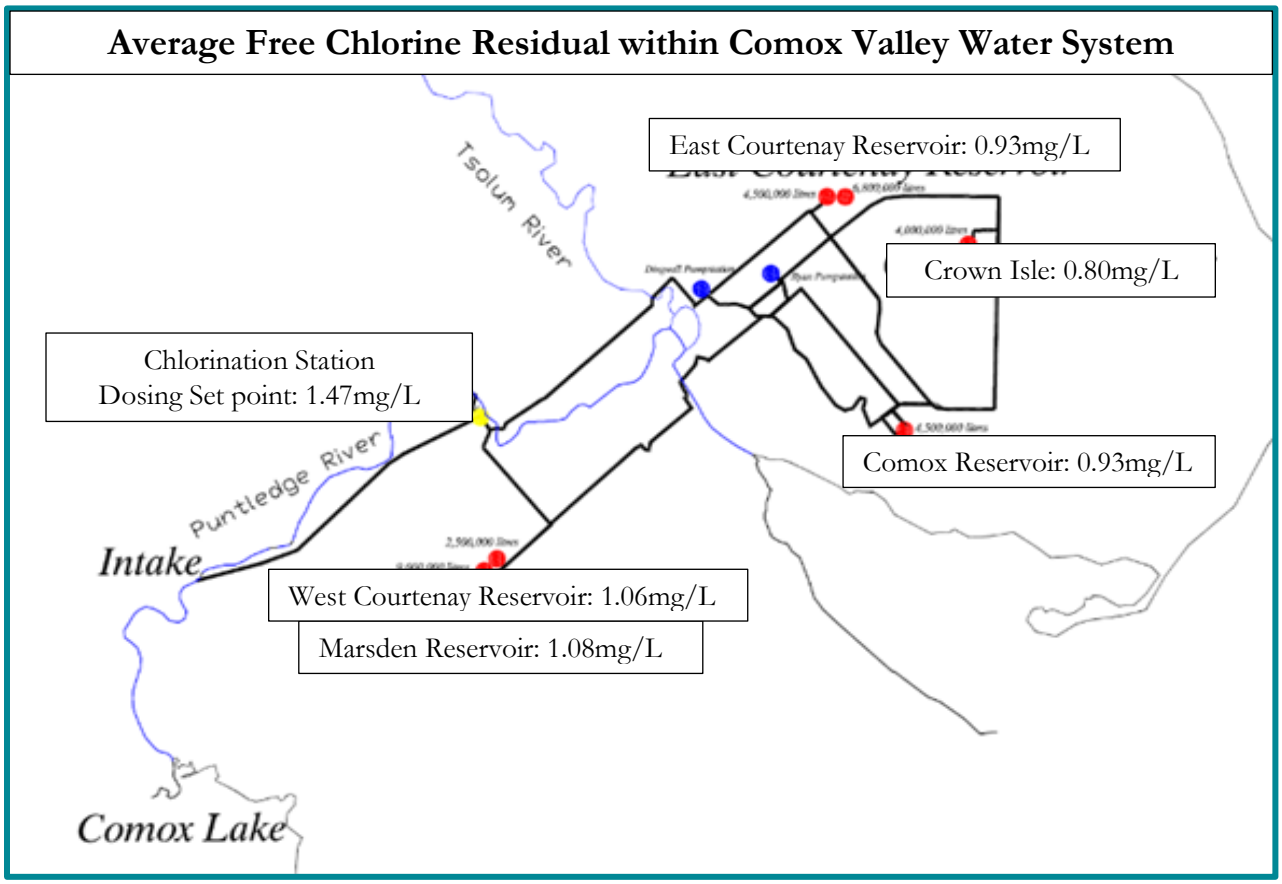


Figure No.3: Average Free Chlorine Residual within CVWS

The CVRD samples quarterly for disinfection by-products (DBP) within the distribution system. Trihalomethanes (THM's) are the organic compounds that form as a DBP from chlorination and are sampled for at the West Courtenay Reservoir. There are four types of DBP that contribute to total THM's. Chloroform is the most commonly regulated DBP and is formed when natural organic matter reacts with chlorine and/or bromine in disinfected water. The guidelines require that total THM's for drinking water must be less than 0.1mg/L, Table No.1 below shows the average total THM's from the quarterly samples. The same results year after year show a continuity in system operations.

Table No.1: Total THM Concentration at the West Courtenay Reservoir

Trihalomethanes	West Courtenay Reservoir
Chloroform	0.029
Bromodichloromethane	0.0011
Dibromochlromethane	<0.001
Bromoform	<0.001
Total Trihalomethanes (mg/L)	**0.030**

Bacteria

E.Coli and total coliform bacteria are microorganisms that if present in water samples indicate possible contamination with sewage or animal wastes. Chlorination helps to remove harmful pathogens within the water supply network. Table No.2 illustrates that the CVRD's water disinfection system met the bacteriological standards for potable water.

Table No.2: Bacteriological Standards and Sampling Results

Parameter	Standard	Result
E.Coli	No detectable E.Coli per 100mL	0 exceedances per 617 samples
Total Coliform Bacteria	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	0 exceedances per 617 samples (100 per cent of samples have no detectable total coliform bacteria, no sample exceeded 2 total coliform bacteria per 100ml)

Canadian Drinking Water Guidelines

Health Canada develops the *Canadian Drinking Water Guidelines*. These are guidelines for limits on microbial, chemical, physical, radiological substances in drinking water. In the guidelines, health-based limits on a substance are assigned a maximum allowable concentration. The guidelines also assign aesthetic objectives to substances that do not cause risk to human health but influence consumer acceptance of the water based on factors such as taste, odour and colour. Table No.3 shows the Comox Reservoir concentration averages compared to guideline concentrations. Distribution water was sampled three times in 2020 from the Comox Reservoir location and the system was below all guideline concentrations.

More information on the parameters listed below, including common sources and health considerations, can be found on the Health Canada website.

Table No.3: Average of Chemical and Physical Parameters at Four Different Reservoir Locations Compared to Guideline Concentrations

Parameter	Average Concentration (mg/L)	Guideline Concentrations (mg/L)
Aluminum	0.0169	≤0.2*
Arsenic	<0.0001	0.01
Barium	<0.001	1.0
Boron	<0.05	5.0
Chloride	2.3	≤250
Chromium	<0.001	0.05
Copper	0.0013	1
Fluoride	<0.050	1.5
Iron	0.0194	≤0.30
Lead	<0.0002	0.01
Manganese	0.0019	≤0.05
Nitrate (as N)	0.041	10
Nitrite (as N)	<0.005	1
Selenium	<0.0001	0.05
Sodium	0.674	≤200
Zinc	<0.005	≤5.0

*These are operational guidance values that only apply to drinking water treatment plants using aluminum-based coagulants. (In 2020 CVWS did not use coagulants.)

Turbidity

By adding UV to the disinfection process, Island Health is able to increase the allowable turbidity limit for boil water notices from 1.0 nephelometric turbidity unit (NTU) up to 3.0 NTU as the community awaits the construction of the new water treatment plant. Over 80 per cent of boil water notices in recent years have been within this range. Once it is constructed, the new water treatment plant will add filtration as an additional barrier to meet provincial drinking water guidelines and eliminate turbidity related boil water notices completely. In 2020, turbidity entering the water system did not exceed 3 NTU and no boil water notices were issued. Figure No.4 shows turbid water entering Comox Lake. Figure No.5 shows the average source water turbidity entering the system at 0.36 NTU.

Figure No.4: Turbid Water from Beech Creek Entering Comox Lake

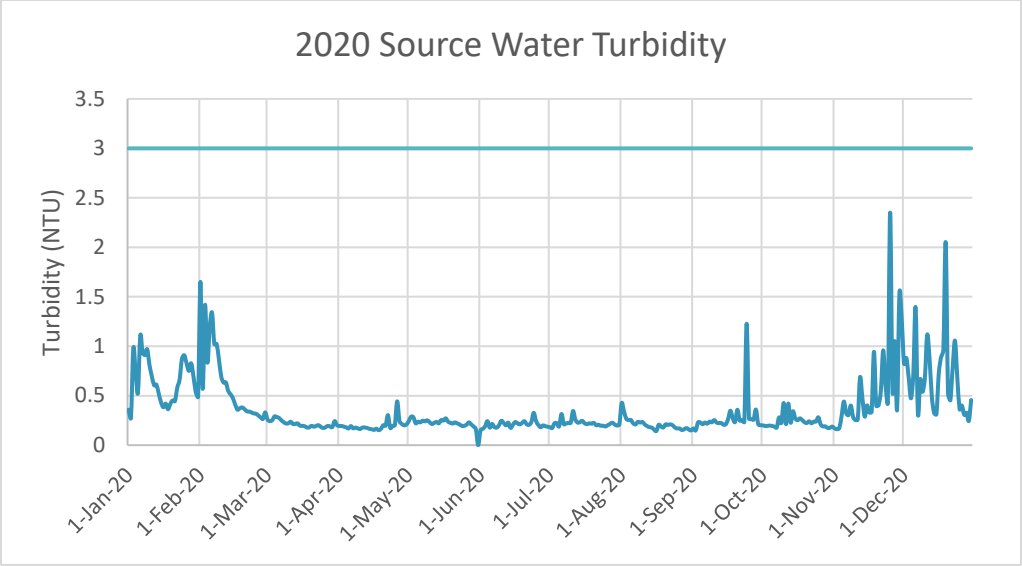


Figure No.5: Average Daily Source Water Turbidity

Temperature

Temperature is described as an aesthetic objective (a parameter that may impair the taste, smell or colour of water) and a physical characteristic of water. Gradual variations in water temperature occur throughout the seasons, however signifcant changes in water temperature can upset chlorination and chemical water treatment processess. The guidelines recommend the temperature to be less than 15° celsius, the average source water temperature for the CVWS was 14.27° celsius. Figure No.6 below shows the incoming source water daily temperautre from the BC Hydro penstock, it can be seen that the water temperature increases in the summer months and decreases in the winter months.

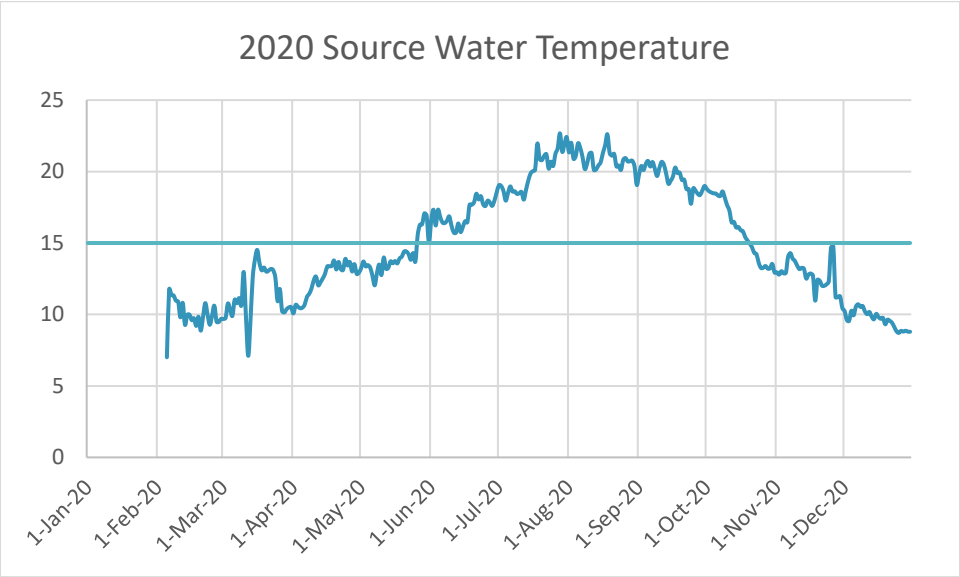


Figure No.6: Source Water Temperature

pH

The pH of water is a measure of acidity. pH has minimal impact for water consumers however it is very important for many operational water quality parameters.The *Canadian Drinking Water Guidelines* recommend the pH ranging between 7.0 to 10.5. pH varies greatly depending on the water source and in 2020 the average pH of the source water was 6.90. Figure No.7 below shows the pH of the incoming source water.

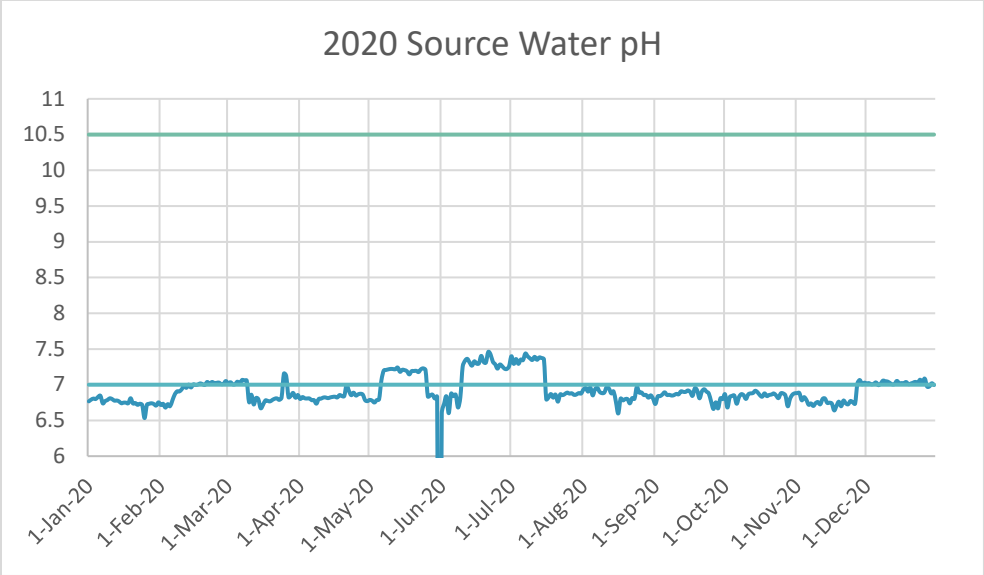


Figure No.7: Source Water pH

Water Quality Concerns

The CVRD continues to monitor water quality in the Comox Lake watershed through a series of programs. In 2009, the CVRD entered into a partnership with the water and aquatic sciences program at the University of Victoria and the Natural Sciences and Engineering Research Council of Canada to study long term climate change impacts and a water quality monitoring project for Comox Lake.

Ensuring high-quality drinking water also requires preservation of water at its source. Continued implementation of the Watershed Protection Plan occurred in 2020. This included collaboration with the many stakeholders within the watershed, hydrodynamic modelling and continued water quality monitoring within the watershed. Turbidity and water quality is monitored at all major tributaries to the Comox Lake and all data is recorded within a watershed database to help inform and provide insight on water quality. Figure No.8 illustrates the size and extent of the Comox Lake watershed.

In 2020 the CVRD continued to partner with the Town of Comox, City of Courtenay, Village of Cumberland and K'ómoks First Nation on a multi-year initiative with the Municipal Natural Asset Initiative (MNAI). The goal of the project is to value natural assets in the watershed to better understand, measure and manage the drinking water services that are provided.

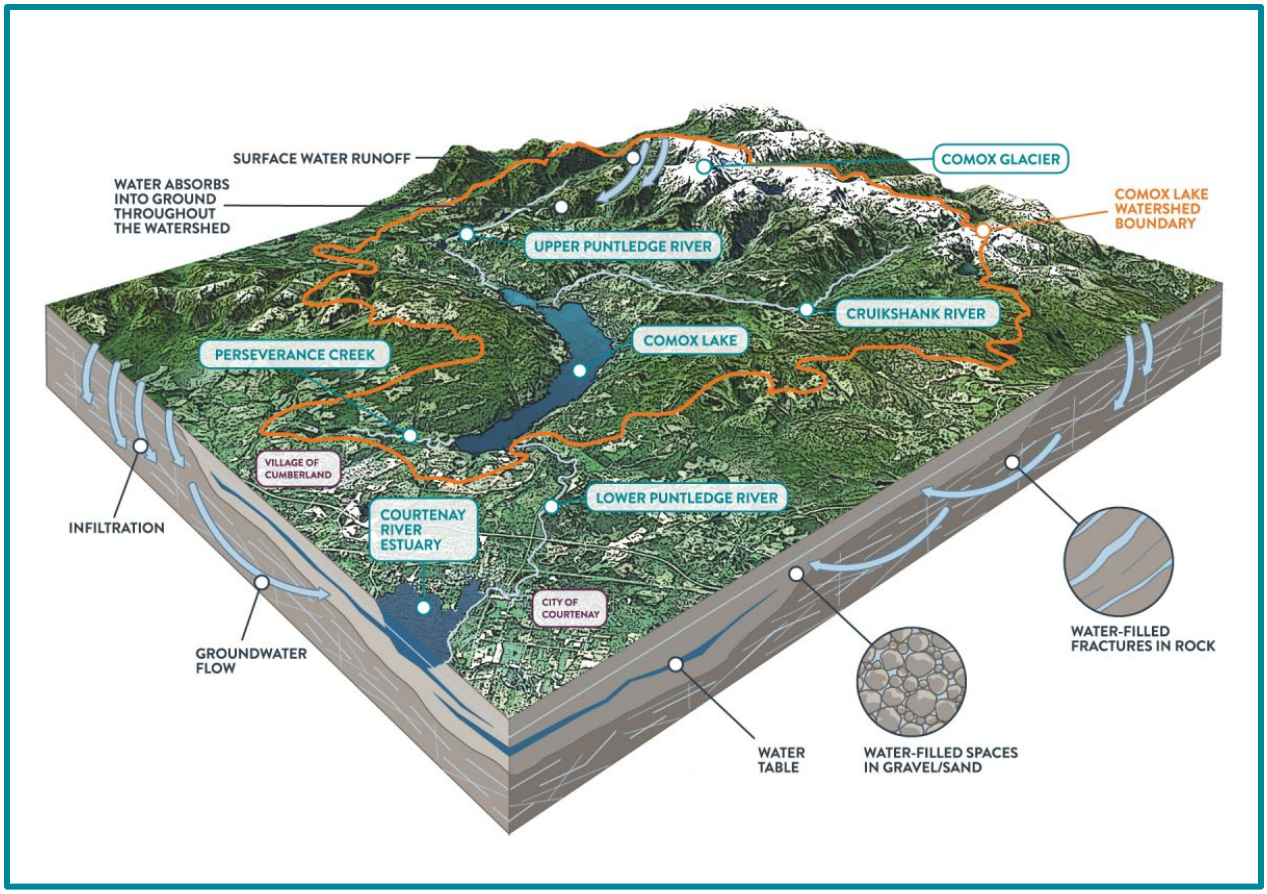


Figure No.8: Comox Lake Watershed

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 in 2020 was 22.4 million litres per day.

To help reduce consumption the CVRD have multiple rebate programs in place to encourage Comox Valley residents to be water efficient. Rebates in 2020 included smart control outdoor irrigation and BC Hydro appliance rebates.

The CVRD closely monitors water demand and compliance to restrictions throughout the year and during summer months water demand increases approximately two fold from normal winter demand, as shown in Figure No.9 below.

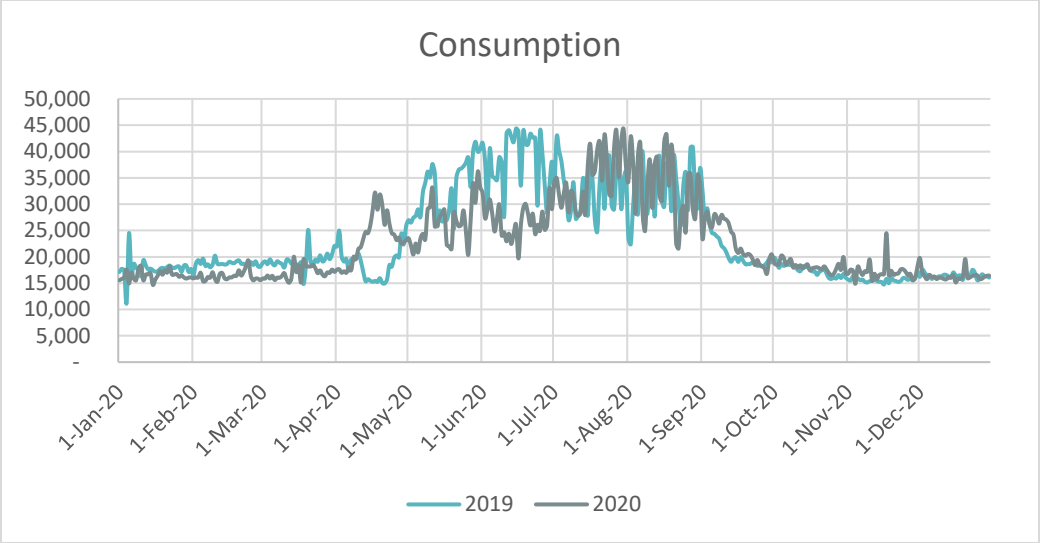


Figure No.9: CVWS Daily Consumption in 2019 and 2020

During times of scarcity the CVRD implements watering restrictions, the CVRD has a four stage system in place for managing water consumption. Stage one is the least restrictive and comes into effect May 1 yearly unless noted otherwise. Stages two, three and four are increasingly more restrictive and are implemented for varying reasons including increasing seriousness of the water shortages, BC Hydro maintenance and peak demand management.

The maximum daily demand (MDD) was 44.3 million litres and occurred on July 30. In comparison to 2019, the MDD decreased from 45.0 to 44.0 million litres. The decrease in the MDD can be attributed to multiple factors, including weather and current watering restrictions.

Maintenance

The waterworks 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 waterworks staff carries out preventive, corrective and emergency maintenance to all parts within the CVWS. This ensures continued operation and supply of safe, clean water to all users. The chlorination facility, reservoirs and distribution system are regularly inspected and maintained.

342 service requests within the system were investigated by the CVRD's Waterworks Operations Staff. Operator's time is primarily dedicated to the operations and maintenance of transmission mains and the treatment system, however Figure No.10 shows the breakdowns of service requests by category.

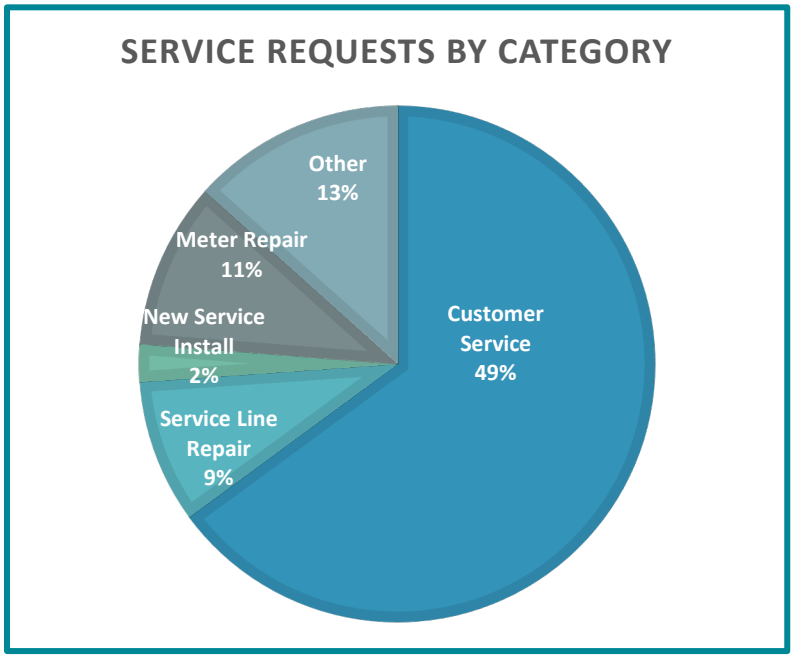


Figure No.10: 2020 Service Requests by Category

Financial

In 2020, the CVRD treated a total of 8.21 million cubic meters of water. Bulk water rates increased in 2020 from \$0.80/m^3 (in 2019)to \$0.83/m^3 to increase the contributions to the capital works reserve in order to reduce borrowing for the Comox Valley Water Treatment Project.

October of 2020 marked 1 year of construction on the Comox Valley Water Treatment Project. Completion of this project will put the CVRD in compliance with the surface water treatment objectives. A number of project milestones were completed in 2020:

- Oct 2020 – completion of the RAW water transmission line which conveys water rom the new lake intake to the Comox Valley Water Treatment Plant.
- Completed tunnelling into Comox Lake
- Completed installation of structural concrete and steel in the water treatment plant.
- Completed installation of structural concrete and steel in the water treatment plant.

The project cost was updated to $126 million in 2019 and the new system is expected to be operational by summer 2021. The five major components of the new system are listed below and shown in Figure No.11.

1. Lake intake to provide water security and conserve water for fish flows down the Puntledge River.
2. Raw water pumping station near the intake.
3. Raw water pipeline from pump station to the treatment plant.
4. Water treatment plant including filtration and disinfection.
5. Treated water pipeline from the plant to the distribution system.

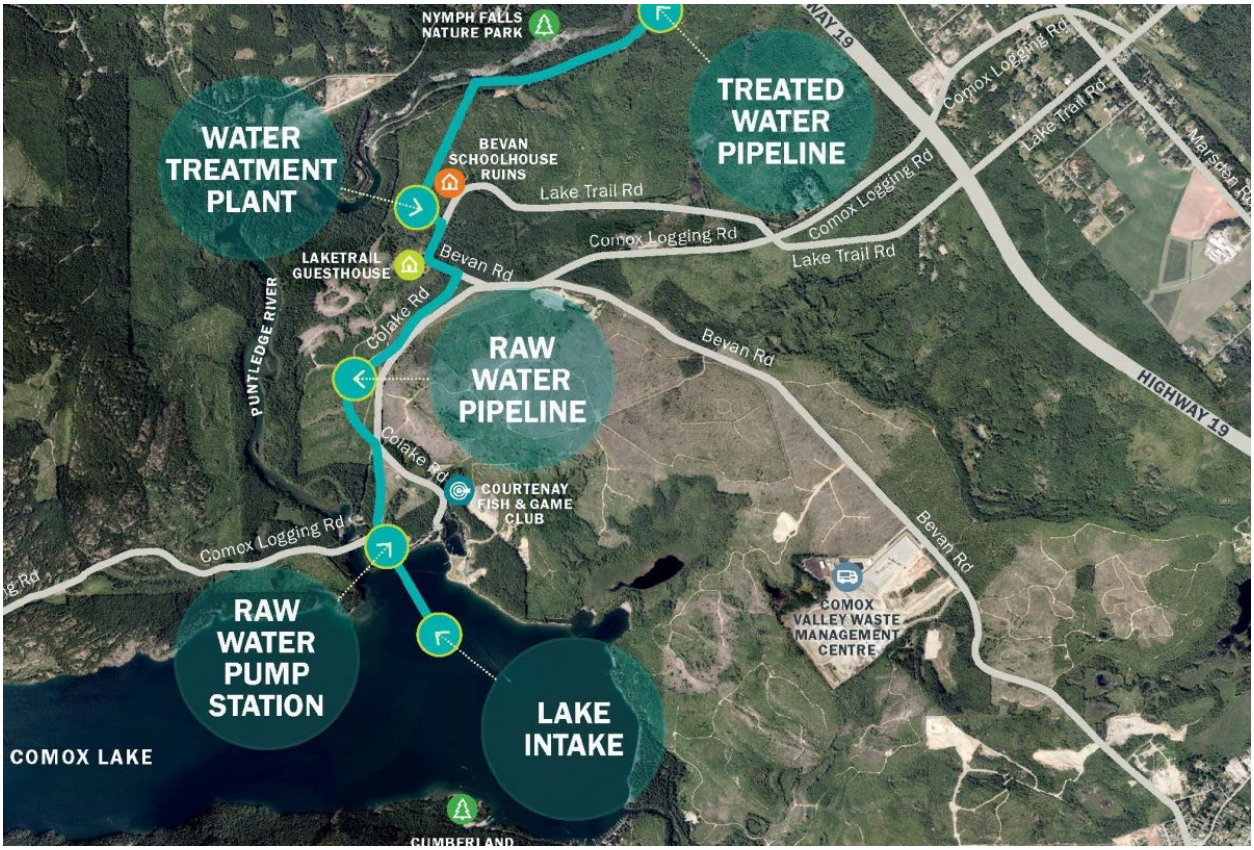


Figure No.11: Water Treatment Project

Funding for the Comox Valley Water Treatment Project is to be through a combination of reserves, grant funding and borrowing. Phase one and two of the project being the pre-implementation and implementation phase received 83 per cent grant funding through the Clean Water and Wastewater Fund. In 2018, the CVRD secured grant funding to offset at least 50 per cent of the total project costs with funding from the provincial and federal governments. This will require the CVRD to borrow up to $29 million, as approved in the alternate approval process.

In 2020, water rates were reviewed as part of this work to ensure sufficient revenue is being collected to help fund future upgrades. The CVRD also continued implementing the Comox Lake Watershed Protection Plan. The CVRD also used the detailed asset management plan to complete a comprehensive rate review and develop a long term water rate schedule.

2020 Accomplishments

- ✓ Effectively operated and maintained the Comox Valley drinking water system within the restraints of the pandemic protocols
- ✓ Completed a full year of construction on the CWWTP project while hitting a number of construction milestones
- ✓ Completed construction and commissioning or the bulk water fill station
- ✓ Completed strategic land purchase in the Comox Lake watershed for protection purposes

2021 Objectives

- Completion of construction and commissioning of the Comox Valley WTP
- Relocation of the entire Water Services department
- Develop an updated Water System Master Plan
- Implementation of a new Computer Maintenance Management System (CMMS)

Appendix A- Parameter Details

Parameter	Method	Data Source
Water Disinfection		
UVT Setpoint	Annual Average	Station Spreadsheet
Calculated Chlorine Dose (mg/L)	Annual Average of East and West	Station Spreadsheet
Trihaolmethanes (mg/L)	Sample Results	Exova Lab Results
Canadian Drinking Water Guidelines		
Canadian Drinking Water Guidelines (table 3)	Sample results	Exova Lab Results
Source Water Turbidity	Annual Average	Pi Database
Source Water Temperature	Annual Average	Pi Database
Source Water pH Levels	Annual Average	Pi Database
Residual Disinfection		
Distribution System (mg/L)	Annual Average of All Sampling Points	WaterTrax Database
End of System Residual	Average of 1750 Astra Road Samples	WaterTrax Database
Total Coliforms	Annual Total	VIHA Water Results 2016
E.Coli Bacteria	Annual Total	VIHA Water Results 2016
Water Demand		
Peak daily usage (m^3/day)	Annual Maximum	Pi Database
Average Daily Consumption (m^3/day)	Annual Total/365	Pi Database

Date	RAW WATER				DISTRIBUTION SYSTEM – Chlorine Residual (mg/L)													
	Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo
01-Jan-20	15,564	6.84	9.3	0.36														
02-Jan-20	15,810	6.85	9.1	0.28														
03-Jan-20	16,086	6.85	8.9	0.98														
04-Jan-20	17,591	6.80	9.1	0.75														
05-Jan-20	14,935	6.84	9.1	0.53														
06-Jan-20	17,014	6.84	9.1	1.11	1.06	1.01	0.95	0.96	1.06	1	1.14	1.02	1	1.12	1.31	0.65		
07-Jan-20	15,866	6.83	8.0	0.94														
08-Jan-20	15,560	6.83	8.1	0.91														
09-Jan-20	17,807	6.80	7.9	0.97														
10-Jan-20	18,262	6.84	7.8	0.81														
11-Jan-20	15,535	6.85	7.8	0.70														
12-Jan-20	16,611	6.85	7.8	0.61														
13-Jan-20	16,668	6.77	7.4	0.61														
14-Jan-20	16,932	6.80	7.1	0.52														
15-Jan-20	14,668	6.78	7.0	0.43							0.08							
16-Jan-20	15,663	6.79	6.1	0.38														
17-Jan-20	16,406	6.77	6.6	0.42														
18-Jan-20	17,312	6.82	6.4	0.36														
19-Jan-20	16,604	6.81	6.9	0.42														
20-Jan-20	17,449	6.78	6.9	0.45	0.94	0.99	0.78	0.89	1	0.89	1.06	0.92	0.99	0.95	1.16	0.78		
21-Jan-20	16,995	6.76	6.9	0.45														
22-Jan-20	18,220	6.78	7.0	0.58														
23-Jan-20	16,646	6.78	7.1	0.66														
24-Jan-20	16,650	6.76	7.2	0.87														
25-Jan-20	16,721	6.71	7.3	0.91														
26-Jan-20	16,198	6.79	7.3	0.83														
27-Jan-20	16,484	6.80	7.3	0.75	0.89	0.99	0.73	0.8	0.9	0.85	0.93	0.89	0.9	0.9	1.15			0.51
28-Jan-20	16,085	6.81	7.4	0.83														
29-Jan-20	15,870	6.78	7.4	0.69														
30-Jan-20	16,051	6.74	7.3	0.53														
31-Jan-20	16,086	6.79	7.3	0.49														
01-Feb-20	15,903	6.77	7.1	1.65														
02-Feb-20	16,101	6.77	6.9	0.57														
03-Feb-20	16,070	6.73	6.9	1.42	0.89	1.05	0.67	0.78	0.89	0.89	0.9	0.77	1.01	1.01	1.09	0.8		
04-Feb-20	16,989	6.71	6.8	0.84														
05-Feb-20	15,376	6.49	7.0	1.19														
06-Feb-20	15,428	6.71	11.8	1.34														
07-Feb-20	16,166	6.77	11.4	1.02														
08-Feb-20	16,050	6.78	11.3	1.02														
09-Feb-20	17,076	6.77	11.0	0.87														
10-Feb-20	15,773	6.83	10.9	0.69	0.86	0.95	0.82	0.73	0.86	0.92	0.86	0.95	0.77	0.98	1.06		0.77	
11-Feb-20	15,260	6.86	9.8	0.63														
12-Feb-20	16,748	6.84	10.8	0.63														
13-Feb-20	16,934	6.90	9.3	0.55														
14-Feb-20	15,937	6.86	10.0	0.51														
15-Feb-20	15,746	6.90	10.0	0.48														
16-Feb-20	16,091	6.88	9.6	0.41														
17-Feb-20	16,098	6.89	9.7	0.36														
18-Feb-20	16,419	6.89	9.2	0.37														
19-Feb-20	16,400	6.90	9.8	0.38	0.89	0.96	0.77	0.71	1	0.84	0.97	0.91	0.93	1.01	1.07	0.77		
20-Feb-20	17,446	6.90	8.9	0.37														
21-Feb-20	16,443	6.91	9.8	0.34														
22-Feb-20	17,162	6.92	10.8	0.34														
23-Feb-20	18,214	6.93	10.0	0.33														
24-Feb-20	19,307	6.92	9.3	0.32	0.86	0.85	0.83	0.73	0.98	0.85	0.97	0.89	0.92	0.86	1.06			
25-Feb-20	16,361	6.94	9.9	0.32													0.42	
26-Feb-20	15,533	6.87	10.6	0.30														
27-Feb-20	15,876	6.94	9.5	0.28														
28-Feb-20	15,848	6.99	9.5	0.27														
29-Feb-20	15,564	6.97	9.7	0.33														
01-Mar-20	15,899	6.94	9.7	0.26														
02-Mar-20	15,883	6.96	9.8	0.24	0.81	0.98	0.72	0.61	0.83	0.79	0.87	0.72	0.86	0.82	0.97	0.64		
03-Mar-20	16,454	6.92	10.8	0.25														
04-Mar-20	15,881	6.90	10.3	0.29														

Date	DISTRIBUTION SYSTEM – Total Coliform													E.Coli												
	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
01-Jan-20																										
02-Jan-20																										
03-Jan-20																										
04-Jan-20																										
05-Jan-20																										
06-Jan-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
07-Jan-20																										
08-Jan-20																										
09-Jan-20																										
10-Jan-20																										
11-Jan-20																										
12-Jan-20																										
13-Jan-20	<1	<1		<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1		<1	<1	<1	<1
14-Jan-20																										
15-Jan-20									<1													<1				
16-Jan-20																										
17-Jan-20																										
18-Jan-20																										
19-Jan-20																										
20-Jan-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
21-Jan-20																										
22-Jan-20																										
23-Jan-20																										
24-Jan-20																										
25-Jan-20																										
26-Jan-20																										
27-Jan-20	<1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
28-Jan-20																										
29-Jan-20																										
30-Jan-20																										
31-Jan-20																										
01-Feb-20																										
02-Feb-20																										
03-Feb-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
04-Feb-20																										
05-Feb-20																										
06-Feb-20																										
07-Feb-20																										
08-Feb-20																										
09-Feb-20																										
10-Feb-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
11-Feb-20																										
12-Feb-20																										
13-Feb-20																										
14-Feb-20																										
15-Feb-20																										
16-Feb-20																										
17-Feb-20																										
18-Feb-20																										
19-Feb-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
20-Feb-20																										
21-Feb-20																										
22-Feb-20																										
23-Feb-20																										
24-Feb-20	<1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
25-Feb-20		<1													<1											
26-Feb-20																										
27-Feb-20																										
28-Feb-20																										
29-Feb-20																										
01-Mar-20																										
02-Mar-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
03-Mar-20																										
04-Mar-20																										

Date	RAW WATER				DISTRIBUTION SYSTEM																																											
					Chlorine Residual (mg/L)															Total Coliform													E.Coli															
	Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
05-Mar-20	16,400	6.96	9.9	0.28																																												
06-Mar-20	15,586	6.93	11.0	0.27																																												
07-Mar-20	16,057	6.93	10.8	0.25																																												
08-Mar-20	16,016	6.92	11.2	0.23																																												
09-Mar-20	16,369	6.94	10.6	0.22	0.81	0.93	0.63	0.62	0.88	0.83	0.85	0.71	0.89	0.92	1.07		0.76		<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
10-Mar-20	16,919	6.84	13.0	0.22																																												
11-Mar-20	15,712	6.71	9.9	0.24																																												
12-Mar-20	15,078	6.74	7.1	0.21																																												
13-Mar-20	15,936	5.29	9.6	0.21																																												
14-Mar-20	20,029	4.78	12.6	0.22																																												
15-Mar-20	17,108	4.59	13.9	0.20																																												
16-Mar-20	18,387	4.54	14.5	0.20	1.03	1.2	0.7	0.71	1.21	0.97	1.1	0.94	1.04	1.23	1.36	0.57			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
17-Mar-20	15,106	4.60	13.6	0.19																																												
18-Mar-20	19,521	4.64	13.1	0.18																																												
19-Mar-20	18,258	4.66	13.3	0.18																																												
20-Mar-20	18,186	4.69	13.0	0.19																																												
21-Mar-20	18,163	4.73	13.1	0.19																																												
22-Mar-20	18,475	4.77	13.2	0.19																																												
23-Mar-20	17,844	4.80	13.1	0.20	1.13	1.16	0.87	0.99	1.24	1.07	1.15	0.99	1.08	1.16	1.21			0.61	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
24-Mar-20	16,888	4.84	12.6	0.18																																												
25-Mar-20	17,431	7.01	10.9	0.17																																												
26-Mar-20	16,609	6.91	11.8	0.18																																												
27-Mar-20	16,316	6.81	10.2	0.19																																												
28-Mar-20	17,054	6.96	10.1	0.19																																												
29-Mar-20	16,940	7.01	10.4	0.18																																												
30-Mar-20	17,573	6.96	10.5	0.24	1.09	1.15	0.87	0.83	1.11	1.09	1.14	1.04	1.06	1.15	1.17	0.99			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
31-Mar-20	17,144	7.00	10.5	0.20																																												
01-Apr-20	17,562	6.98	10.1	0.19																																												
02-Apr-20	17,638	7.00	10.7	0.19																																												
03-Apr-20	16,968	6.99	10.5	0.19																																												
04-Apr-20	17,262	7.01	10.4	0.18																																												
05-Apr-20	16,973	6.99	10.5	0.17																																												
06-Apr-20	17,991	6.98	10.7	0.19	1.08	1.1	0.87	0.99	1.14	1.07	1.7	0.92	1.07	1.2	1.26	0.92			<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
07-Apr-20	17,454	6.98	11.2	0.17																																												
08-Apr-20	20,009	6.95	11.4	0.18																																												
09-Apr-20	19,556	7.01	11.8	0.17																																												
10-Apr-20	21,487	7.02	12.4	0.16																																												
11-Apr-20	21,829	6.99	12.7	0.18																																												
12-Apr-20	23,315	7.01	12.0	0.18																																												
13-Apr-20	24,729	7.03	12.3	0.17																																												
14-Apr-20	24,503	6.96	12.5	0.16	1.03	1.15	1.09	1.21	1.2	1.1	1.12	1.14	1.16	1.2	1.3		1.15		<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
15-Apr-20	25,981	7.08	12.8	0.16																																												
16-Apr-20	28,917	7.02	13.4	0.15																																												
17-Apr-20	32,232	7.02	13.4	0.17																																												
18-Apr-20	28,951	7.00	13.4	0.15																																												
19-Apr-20	31,852	7.02	13.8	0.16																																												
20-Apr-20	29,905	7.00	13.1	0.20		1.1	1.04	1.06	1.27	1.04	1.16	0.94	1.17	1.14	1.24	0.89			<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
21-Apr-20	26,061	7.13	13.7	0.20																																												
22-Apr-20	28,850	7.15	13.2	0.30																																												
23-Apr-20	26,280	7.08	13.1	0.17																																												
24-Apr-20	24,473	7.06	13.9	0.20																																												
25-Apr-20	24,248	7.08	13.4	0.20																																												
26-Apr-20	23,165	7.09	13.7	0.44																																												
27-Apr-20	23,675	7.10	13.0	0.24	0.99	1.05	0.9	0.99	1.1	0.99	1.04	0.77	1.15	1.01	1.12			0.74	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
28-Apr-20	22,508	7.11	13.5	0.21																																												
29-Apr-20	22,744	7.07	12.8	0.20																																												
30-Apr-20	23,156	7.04	12.9	0.21																																												
01-May-20	23,526	7.09	13.3	0.24																																												
02-May-20	22,173	7.10	13.7	0.29																																												
03-May-20	20,429	7.06	13.4	0.28																																												
04-May-20	22,536	7.07	13.5	0.22	0.89	1	0.86	0.98	1.1	0.97	1.06	1.04	1.04	1.03	1.13	0.91			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
05-May-20	20,832	7.07	13.3	0.24																																												
06-May-20	23,505	7.04	12.7	0.23																																												
07-May-20	24,367	7.14	12.0	0.25																																												

Date	RAW WATER				DISTRIBUTION SYSTEM													
					Chlorine Residual (mg/L)													
	Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo
08-May-20	23,297	7.14	12.9	0.24														
09-May-20	29,069	7.02	13.5	0.25														
10-May-20	29,446	7.11	12.8	0.23														
11-May-20	33,130	6.95	14.0	0.21	0.6	0.78	0.66	0.77	0.88	0.72	0.86	0.75	0.76	0.78	0.95		0.29	
12-May-20	25,779	7.11	13.2	0.23														
13-May-20	26,048	7.14	13.3	0.23														
14-May-20	27,599	7.07	13.7	0.22														
15-May-20	28,207	7.06	13.6	0.25														
16-May-20	28,968	7.11	13.7	0.25														
17-May-20	22,288	7.10	13.6	0.27														
18-May-20	22,033	7.08	13.9	0.24														
19-May-20	21,480	7.11	14.0	0.23	0.6	0.72	0.72	0.74	0.93	0.66	0.86	0.85	0.85	0.81	0.98	0.5		
20-May-20	28,388	7.07	14.4	0.22														
21-May-20	26,855	7.07	14.4	0.23														
22-May-20	25,819	7.04	14.2	0.22														
23-May-20	26,066	7.10	13.8	0.21														
24-May-20	28,818	7.03	14.3	0.19														
25-May-20	24,906	7.00	13.7	0.20	0.92	1.17	0.91	1.09	1.27	0.96	1.19	1.17	1.25	1.26	1.41			0.76
26-May-20	20,373	6.76	15.5	0.21														
27-May-20	27,014	7.05	16.3	0.23														
28-May-20	34,002	7.09	16.3	0.21														
29-May-20	30,265	7.07	17.1	0.19														
30-May-20	36,209	7.07	16.9	0.16														
31-May-20	33,210	7.00	15.0	0.15														
01-Jun-20	32,089	6.99	16.6	0.15	0.68	0.78	0.64	0.71	0.85	0.71	0.85	0.75	0.84	0.82	0.81	0.58		
02-Jun-20	27,352	7.05	17.3	0.17														
03-Jun-20	28,841	7.12	16.2	0.19														
04-Jun-20	30,927	6.99	17.3	0.24														
05-Jun-20	28,286	7.16	16.8	0.18														
06-Jun-20	24,819	7.11	16.4	0.21														
07-Jun-20	27,223	7.14	16.4	0.18														
08-Jun-20	29,946	7.04	16.6	0.18	0.67	0.79	0.63	0.85	0.88	0.72	0.87	0.73	0.87	0.77	0.88		0.6	
09-Jun-20	24,053	7.11	16.9	0.20														
10-Jun-20	24,690	7.16	16.2	0.25														
11-Jun-20	22,941	7.20	15.7	0.23														
12-Jun-20	24,397	7.22	15.7	0.20														
13-Jun-20	22,425	7.20	16.4	0.23														
14-Jun-20	24,378	7.17	15.8	0.17														
15-Jun-20	26,101	7.20	16.1	0.21	0.64	0.7	0.48	0.4	0.92	0.6	0.83	0.63	0.69	0.77	0.96	0.46		
16-Jun-20	19,686	7.18	16.5	0.23														
17-Jun-20	25,966	7.20	16.4	0.22														
18-Jun-20	29,257	7.23	17.7	0.21														
19-Jun-20	30,072	7.21	17.7	0.23														
20-Jun-20	28,198	7.19	17.9	0.24														
21-Jun-20	25,947	7.27	18.5	0.21														
22-Jun-20	28,208	7.25	18.1	0.21	0.7	0.79	0.59	0.76	0.95	0.75	0.96	0.74	0.77	0.74	0.96			0.5
23-Jun-20	24,315	7.19	18.3	0.23														
24-Jun-20	26,113	7.17	17.7	0.33														
25-Jun-20	24,923	7.14	17.6	0.24														
26-Jun-20	28,601	7.16	18.0	0.20														
27-Jun-20	25,137	7.12	17.8	0.18														
28-Jun-20	25,996	7.14	17.6	0.20														
29-Jun-20	33,089	7.10	18.0	0.19	0.83	0.9	0.69	0.89	1.02	0.75	1.04	0.9	0.96	0.82	1.15	1.06		
30-Jun-20	29,051	7.09	18.6	0.19														
01-Jul-20	34,221	7.24	19.0	0.18														
02-Jul-20	34,987	7.21	19.0	0.17														
03-Jul-20	31,763	7.22	18.6	0.22														
04-Jul-20	29,308	7.15	18.0	0.22														
05-Jul-20	32,112	7.15	18.5	0.19														
06-Jul-20	34,042	7.21	19.0	0.32	0.77	0.83	0.53	0.75	0.86	0.72	0.8	0.74	0.79	0.75	0.85	0.56		
07-Jul-20	28,467	7.27	18.6	0.21														
08-Jul-20	32,488	7.28	18.6	0.22														
09-Jul-20	31,724	7.24	18.4	0.23														
10-Jul-20	28,559	7.26	18.5	0.23														

Date	Total Coliform													E.Coli												
	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
08-May-20																										
09-May-20																										
10-May-20																										
11-May-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
12-May-20																										
13-May-20																										
14-May-20																										
15-May-20																										
16-May-20																										
17-May-20																										
18-May-20																										
19-May-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
20-May-20																										
21-May-20																										
22-May-20																										
23-May-20																										
24-May-20																										
25-May-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
26-May-20																										
27-May-20																										
28-May-20																										
29-May-20																										
30-May-20																										
31-May-20																										
01-Jun-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
02-Jun-20																										
03-Jun-20																										
04-Jun-20																										
05-Jun-20																										
06-Jun-20																										
07-Jun-20																										
08-Jun-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
09-Jun-20																										
10-Jun-20																										
11-Jun-20																										
12-Jun-20																										
13-Jun-20																										
14-Jun-20																										
15-Jun-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
16-Jun-20																										
17-Jun-20																										
18-Jun-20																										
19-Jun-20																										
20-Jun-20																										
21-Jun-20																										
22-Jun-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
23-Jun-20																										
24-Jun-20																										
25-Jun-20																										
26-Jun-20																										
27-Jun-20																										
28-Jun-20																										
29-Jun-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
30-Jun-20																										
01-Jul-20																										
02-Jul-20																										
03-Jul-20																										
04-Jul-20																										
05-Jul-20																										
06-Jul-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
07-Jul-20																										
08-Jul-20																										
09-Jul-20																										
10-Jul-20																										

Date	RAW WATER				DISTRIBUTION SYSTEM – Chlorine Residual (mg/L)													
	Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo
11-Jul-20	27,774	7.26	18.6	0.35														
12-Jul-20	28,341	7.22	18.0	0.26														
13-Jul-20	32,424	7.18	18.7	0.23	0.73	0.75	0.3	0.79	1.22	0.76	0.96	0.77	0.93	0.79	0.91		0.87	
14-Jul-20	27,985	7.26	19.4	0.23														
15-Jul-20	37,109	7.20	19.9	0.25														
16-Jul-20	41,483	6.95	20.0	0.22							1.04							
17-Jul-20	35,662	6.96	20.1	0.21														
18-Jul-20	36,309	6.89	22.0	0.22														
19-Jul-20	40,464	6.98	20.9	0.22														
20-Jul-20	41,846	6.99	20.8	0.23	0.94	1.02	0.79	0.92	1.1	0.92	1.08	0.91	1	1.02	1.15	0.83		
21-Jul-20	34,450	6.95	21.1	0.20														
22-Jul-20	43,219	6.93	21.2	0.21														
23-Jul-20	38,463	6.97	20.2	0.20														
24-Jul-20	31,882	6.98	20.7	0.20														
25-Jul-20	31,598	6.98	20.4	0.19														
26-Jul-20	40,537	6.99	21.2	0.20														
27-Jul-20	44,047	6.95	21.6	0.22	0.81	1.04	0.83	1.13	1.18	0.87	1.13	0.94	1.1	1	1.14			0.63
28-Jul-20	35,125	6.99	22.7	0.23														
29-Jul-20	41,896	6.91	21.4	0.21														
30-Jul-20	44,286	6.95	21.9	0.20														
31-Jul-20	37,118	7.00	22.4	0.21														
01-Aug-20	34,296	6.97	21.3	0.43														
02-Aug-20	42,858	7.00	22.0	0.34														
03-Aug-20	37,741	7.00	20.9	0.27														
04-Aug-20	28,157	6.95	21.1	0.25	0.86	0.97	0.81	0.92	1.06	0.87	1.06	0.91	1.02	0.95	1.09	0.78		
05-Aug-20	39,173	7.02	22.0	0.25														
06-Aug-20	41,629	6.99	21.6	0.22														
07-Aug-20	27,962	7.06	21.0	0.21														
08-Aug-20	24,945	7.01	20.2	0.24														
09-Aug-20	33,851	7.00	20.5	0.23														
10-Aug-20	38,435	6.95	21.2	0.23	0.76	0.85	0.58	0.78	0.9	0.81	1	0.7	0.8	0.8	1		0.82	
11-Aug-20	29,279	7.06	21.3	0.21														
12-Aug-20	37,502	7.04	20.1	0.19														
13-Aug-20	38,961	7.03	20.1	0.18														
14-Aug-20	31,807	7.00	20.4	0.18														
15-Aug-20	30,693	6.85	20.6	0.16														
16-Aug-20	41,804	6.71	21.3	0.14														
17-Aug-20	43,236	6.86	21.8	0.21	0.92	1.07	0.89	1.21	1.25	0.94	1.17	1.02	1.22	1.08	1.18	1		
18-Aug-20	33,485	6.84	22.6	0.19														
19-Aug-20	41,311	6.81	21.3	0.18														
20-Aug-20	36,278	6.89	21.1	0.21														
21-Aug-20	22,632	6.90	21.2	0.20														
22-Aug-20	21,576	6.86	20.4	0.21														
23-Aug-20	27,995	6.84	20.4	0.20														
24-Aug-20	29,654	6.92	20.1	0.18	0.96	1.04	0.88	1.11	1.37	1	1.17	1.03	1.32	1.13	1.05	0.43		
25-Aug-20	24,711	7.01	20.8	0.17														
26-Aug-20	35,657	7.00	20.9	0.17														
27-Aug-20	35,859	6.99	20.7	0.15														
28-Aug-20	29,002	7.00	20.7	0.16														
29-Aug-20	27,281	6.95	20.8	0.17														
30-Aug-20	35,601	6.95	20.4	0.16														
31-Aug-20	33,658	6.94	19.1	0.15	0.8	0.89	0.7	0.78	1.08	0.87	0.93	0.84	0.98	0.86	0.97	0.8		
01-Sep-20	23,467	6.92	19.8	0.17														
02-Sep-20	27,232	6.96	20.4	0.15														
03-Sep-20	28,596	6.98	20.1	0.23														
04-Sep-20	26,193	6.99	20.5	0.23														
05-Sep-20	25,569	7.02	20.7	0.21														
06-Sep-20	28,086	6.99	20.4	0.23														
07-Sep-20	27,551	6.99	20.7	0.22	0.74	0.78	0.66	0.76	0.97	0.74	0.89	0.67	0.89	0.95	1.01	0.65		
08-Sep-20	26,318	6.98	20.2	0.24														
09-Sep-20	27,976	6.95	19.7	0.23														
10-Sep-20	27,290	7.00	20.2	0.25														
11-Sep-20	27,040	7.01	20.7	0.23														
12-Sep-20	26,372	7.02	20.5	0.22														

Date	Total Coliform													E.Coli												
	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
11-Jul-20																										
12-Jul-20																										
13-Jul-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
14-Jul-20																										
15-Jul-20																										
16-Jul-20																										
17-Jul-20																										
18-Jul-20																										
19-Jul-20																										
20-Jul-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
21-Jul-20																										
22-Jul-20																										
23-Jul-20																										
24-Jul-20																										
25-Jul-20																										
26-Jul-20																										
27-Jul-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
28-Jul-20																										
29-Jul-20																										
30-Jul-20																										
31-Jul-20																										
01-Aug-20																										
02-Aug-20																										
03-Aug-20																										
04-Aug-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
05-Aug-20																										
06-Aug-20																										
07-Aug-20																										
08-Aug-20																										
09-Aug-20																										
10-Aug-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
11-Aug-20																										
12-Aug-20																										
13-Aug-20																										
14-Aug-20																										
15-Aug-20																										
16-Aug-20																										
17-Aug-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
18-Aug-20																										
19-Aug-20																										
20-Aug-20																										
21-Aug-20																										
22-Aug-20																										
23-Aug-20																										
24-Aug-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
25-Aug-20																										
26-Aug-20																										
27-Aug-20																										
28-Aug-20																										
29-Aug-20																										
30-Aug-20																										
31-Aug-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
01-Sep-20																										
02-Sep-20																										
03-Sep-20																										
04-Sep-20																										
05-Sep-20																										
06-Sep-20																										
07-Sep-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
08-Sep-20																										
09-Sep-20																										
10-Sep-20																										
11-Sep-20																										
12-Sep-20																										

Date	RAW WATER				DISTRIBUTION SYSTEM																																							
					Chlorine Residual (mg/L)														Total Coliform													E.Coli												
	Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
13-Sep-20	24,761	7.01	19.9	0.22																																							
14-Sep-20	24,198	7.01	19.1	0.21	0.61	0.81	0.61	0.77	0.98	0.75	0.85	0.75	0.94	0.87	1		0.94		<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
15-Sep-20	21,480	7.07	19.4	0.21																																							
16-Sep-20	20,731	7.05	19.6	0.26																																							
17-Sep-20	21,583	7.00	20.3	0.35																																							
18-Sep-20	20,588	7.09	19.9	0.27																																							
19-Sep-20	20,202	7.03	19.9	0.23																																							
20-Sep-20	20,542	6.94	19.4	0.36																																							
21-Sep-20	20,355	7.02	19.4	0.25	0.59	0.69	0.43	0.39	0.77	0.65	0.57	0.53	0.71	0.78	0.91	0.37			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
22-Sep-20	19,590	6.98	18.8	0.25																																							
23-Sep-20	18,423	7.07	18.8	0.23																																							
24-Sep-20	19,407	6.98	17.7	1.23																																							
25-Sep-20	18,372	6.94	18.8	0.27																																							
26-Sep-20	18,254	6.83	18.7	0.26																																							
27-Sep-20	17,789	6.88	18.4	0.26																																							
28-Sep-20	16,784	6.81	18.4	0.36	0.54	0.88	0.25	0.74	0.78	0.46	0.72	0.36	0.54	1.17	1.44	0.35			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
29-Sep-20	19,541	6.93	18.7	0.21																																							
30-Sep-20	20,485	6.95	19.0	0.20																																							
01-Oct-20	18,864	6.99	18.8	0.20																																							
02-Oct-20	18,490	6.88	18.6	0.19																																							
03-Oct-20	18,640	6.97	18.5	0.19																																							
04-Oct-20	20,222	6.98	18.5	0.20																																							
05-Oct-20	19,844	6.97	18.5	0.19	0.76	0.91	0.43	0.54	0.88	0.88	0.82	0.59	0.75	0.98	1.02	0.67			<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
06-Oct-20	18,515	6.91	18.3	0.19																																							
07-Oct-20	19,086	6.96	18.3	0.18																																							
08-Oct-20	19,583	6.97	18.6	0.28																																							
09-Oct-20	17,964	6.97	18.2	0.23																																							
10-Oct-20	18,454	6.94	17.6	0.43																																							
11-Oct-20	17,940	6.99	17.3	0.21																																							
12-Oct-20	18,399	6.99	16.4	0.42																																							
13-Oct-20	17,801	7.00	16.5	0.23	0.72	0.84	0.5	0.56	0.77	0.72	0.87	0.59	0.59	0.93	1.03	0.59			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
14-Oct-20	18,209	7.00	16.1	0.34																																							
15-Oct-20	18,572	7.01	16.1	0.27																																							
16-Oct-20	17,413	6.97	15.9	0.25																																							
17-Oct-20	17,847	6.97	15.8	0.27																																							
18-Oct-20	17,948	6.98	15.4	0.25																																							
19-Oct-20	18,030	6.95	15.2	0.23	0.73	0.87	0.47	0.58	0.95	0.73	0.88	0.6	0.82	0.85	0.97	0.57			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
20-Oct-20	17,806	6.98	15.0	0.22																																							
21-Oct-20	17,680	6.97	14.7	0.24																																							
22-Oct-20	18,193	6.98	14.3	0.22																																							
23-Oct-20	17,578	6.96	14.2	0.24																																							
24-Oct-20	16,884	6.94	13.6	0.24																																							
25-Oct-20	16,526	6.97	13.3	0.28																																							
26-Oct-20	16,782	6.98	13.3	0.21	0.58	0.77	0.43	0.62	0.9	0.84	1.06	1.12	0.94	0.64	1.03			0.26	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
27-Oct-20	17,737	6.97	13.4	0.19																																							
28-Oct-20	18,670	6.90	13.2	0.19																																							
29-Oct-20	17,511	6.94	13.2	0.17										1.67																													
30-Oct-20	19,977	6.97	13.5	0.18																																							
31-Oct-20	16,904	6.99	12.9	0.19																																							
01-Nov-20	16,793	7.00	13.0	0.17																																							
02-Nov-20	17,565	7.00	12.8	0.16	1.03	1.12	0.54	0.67	0.82	1.22	1	0.73	0.95	1.13	1.1	0.56			<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
03-Nov-20	17,361	6.94	13.0	0.17																																							
04-Nov-20	14,878	6.96	12.9	0.29																																							
05-Nov-20	18,107	6.94	12.9	0.44																																							
06-Nov-20	17,297	6.57	14.0	0.32																																							
07-Nov-20	16,561	6.83	14.3	0.30																																							
08-Nov-20	17,274	6.86	13.9	0.40																																							
09-Nov-20	17,176	6.89	13.7	0.28	0.63	0.71	0.46	0.62	1.1	0.88	0.85	0.53	0.72	0.78	1.19		0.76		<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
10-Nov-20	19,508	6.91	13.4	0.25																																							
11-Nov-20	15,487	6.90	13.2	0.26																																							
12-Nov-20	16,794	6.94	13.3	0.69																																							
13-Nov-20	15,771	6.94	13.2	0.48																																							
14-Nov-20	16,537	6.90	12.5	0.29																																							
15-Nov-20	16,716	6.92	12.8	0.40																																							

RAW WATER / DISTRIBUTION SYSTEM – Chlorine Residual (mg/L)

Date	RAW WATER Consumption (m3)	pH	Temperature (˚C)	Turbidity (NTU)	74 Salsbury	Arden Station	1750 Astra	2490 Waveland	4871 Greaves Crescent	3441 Cumberland	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir	2390 Rennison	2472 Gibson	2701 Elmo
16-Nov-20	16,736	6.90	12.9	0.33	0.81	0.93	0.65	0.8	1.03	0.91	0.95	0.78	1.04	0.98	1	0.79		
17-Nov-20	24,503	6.85	12.7	0.34									1.82					
18-Nov-20	16,479	6.89	11.0	0.94														
19-Nov-20	17,360	6.91	12.4	0.40														
20-Nov-20	16,596	6.86	12.4	0.40														
21-Nov-20	16,774	6.90	12.0	0.55														
22-Nov-20	16,856	6.89	12.0	0.96														
23-Nov-20	17,607	6.88	12.1	0.61	0.79	0.87	0.75	0.7	0.83	0.82	0.82	0.81	0.91	1	1.1			0.59
24-Nov-20	17,642	6.92	12.3	0.43														
25-Nov-20	17,181	6.94	14.7	2.35														
26-Nov-20	16,501	6.82	14.8	0.55														
27-Nov-20	16,776	6.92	11.2	1.05														
28-Nov-20	15,615	6.98	11.2	0.36														
29-Nov-20	15,920	6.94	11.3	1.53														
30-Nov-20	18,137	6.96	10.5	1.27	0.68	0.76	0.67	0.59	0.63	0.78	0.75	0.73	0.79	0.81	0.79			0.65
01-Dec-20	19,802	6.90	10.2	0.82														
02-Dec-20	17,088	6.91	9.6	0.88														
03-Dec-20	16,285	6.93	9.6	0.69														
04-Dec-20	15,749	6.93	10.3	0.47														
05-Dec-20	16,555	6.95	9.9	0.71														
06-Dec-20	16,139	6.93	10.5	1.39														
07-Dec-20	16,263	6.94	10.7	0.32	0.46	0.58	0.46	0.48	0.78	0.5	0.64	0.54	0.79	0.65	0.87	0.41		
08-Dec-20	15,788	6.99	10.5	0.66														
09-Dec-20	16,025	6.99	10.6	0.54														
10-Dec-20	16,014	6.98	10.2	0.68														
11-Dec-20	15,794	6.97	10.0	1.12														
12-Dec-20	15,719	6.95	10.2	0.88														
13-Dec-20	16,133	6.95	9.8	0.49														
14-Dec-20	16,066	6.98	9.7	0.32	0.73	0.71	0.52	0.68	0.77	0.73	0.69	0.62	0.84	0.69	0.86	0.53		
15-Dec-20	16,561	6.95	10.0	0.31														
16-Dec-20	15,138	6.96	9.8	0.72														
17-Dec-20	15,910	6.96	9.7	0.89														
18-Dec-20	15,807	6.96	9.8	0.97														
19-Dec-20	16,240	6.97	9.3	2.05														
20-Dec-20	19,606	6.97	9.6	0.53														
21-Dec-20	15,974	6.97	9.6	0.45	0.66	0.74	0.51	0.63	0.71	0.66	0.73	0.66	0.74	0.76	0.87		0.56	
22-Dec-20	16,111	6.97	9.4	0.78														
23-Dec-20	16,368	6.96	9.1	1.06														
24-Dec-20	16,488	6.96	8.8	0.69														
25-Dec-20	16,495	6.95	8.7	0.36														
26-Dec-20	15,809	6.97	8.9	0.40														
27-Dec-20	15,835	6.93	8.8	0.31														
28-Dec-20	16,210	6.91	8.9	0.33														
29-Dec-20	16,403	6.94	8.8	0.25	0.78	0.69	0.48	0.6	0.82	0.59	0.77	0.58	0.51	0.78	0.87			0.26
30-Dec-20	16,446	6.94	8.8	0.46														
Count	**365**	**365**	**365**	**365**	**50**	**51**	**51**	**51**	**51**	**51**	**53**	**51**	**52**	**52**	**51**	**30**	**11**	**10**
Average	**22,495**	**6.90**	**14.27**	**0.36**	**0.81**	**0.91**	**0.68**	**0.78**	**0.98**	**0.84**	**0.94**	**0.81**	**0.93**	**0.95**	**1.06**	**0.68**	**0.72**	**0.55**
Exceedances																		

DISTRIBUTION SYSTEM – Total Coliform

Date	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
16-Nov-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
17-Nov-20													
18-Nov-20													
19-Nov-20													
20-Nov-20													
21-Nov-20													
22-Nov-20													
23-Nov-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
24-Nov-20													
25-Nov-20													
26-Nov-20													
27-Nov-20													
28-Nov-20													
29-Nov-20													
30-Nov-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
01-Dec-20													
02-Dec-20													
03-Dec-20													
04-Dec-20													
05-Dec-20													
06-Dec-20													
07-Dec-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
08-Dec-20													
09-Dec-20													
10-Dec-20													
11-Dec-20													
12-Dec-20													
13-Dec-20													
14-Dec-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
15-Dec-20													
16-Dec-20													
17-Dec-20													
18-Dec-20													
19-Dec-20													
20-Dec-20													
21-Dec-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
22-Dec-20													
23-Dec-20													
24-Dec-20													
25-Dec-20													
26-Dec-20													
27-Dec-20													
28-Dec-20													
29-Dec-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
30-Dec-20													
Count	**56**	**26**	**25**	**56**	**55**	**56**	**54**	**57**	**55**	**56**	**56**	**56**	**56**
Average													
Exceedances	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

DISTRIBUTION SYSTEM – E.Coli

Date	1750 Astra	2472 Gibson	2390 Rennison	2490 Waveland	Arden Stn	3441 Cumberland	4871 Greaves Crescent	74 Salsbury	Comox Res.	Crown Isle Res.	E. Courtenay Reservoir	Marsden Res.	W.Courtenay Reservoir
16-Nov-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
17-Nov-20													
18-Nov-20													
19-Nov-20													
20-Nov-20													
21-Nov-20													
22-Nov-20													
23-Nov-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
24-Nov-20													
25-Nov-20													
26-Nov-20													
27-Nov-20													
28-Nov-20													
29-Nov-20													
30-Nov-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
01-Dec-20													
02-Dec-20													
03-Dec-20													
04-Dec-20													
05-Dec-20													
06-Dec-20													
07-Dec-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
08-Dec-20													
09-Dec-20													
10-Dec-20													
11-Dec-20													
12-Dec-20													
13-Dec-20													
14-Dec-20	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
15-Dec-20													
16-Dec-20													
17-Dec-20													
18-Dec-20													
19-Dec-20													
20-Dec-20													
21-Dec-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
22-Dec-20													
23-Dec-20													
24-Dec-20													
25-Dec-20													
26-Dec-20													
27-Dec-20													
28-Dec-20													
29-Dec-20	<1	<1		<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
30-Dec-20													
Count	**56**	**26**	**25**	**56**	**55**	**56**	**54**	**57**	**56**	**56**	**56**	**56**	**56**
Average													
Exceedances	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**