

Annual Drinking Water
Report - 2023

Union Bay Water System



 **Comox Valley**
REGIONAL DISTRICT

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The CVRD respectfully acknowledges that the land on which it operates is on the unceded traditional territory of the K'ómoks First Nation, the traditional keepers of this land.

Introduction

The Comox Valley Regional District strives to provide high-quality drinking water through responsible operation and management of the water system. The CVRD is regulated by Island Health for its activities as a potable water supplier and is required under the *Drinking Water Protection Act* to report annually on the Union Bay Water System. This report includes information on water quality, consumption, maintenance, and capital projects.

The CVRD provides water to roughly 1500 residents in the Union Bay Service Area.



Source Water

Water for the Union Bay Service Area is sourced from Langley Lake, a spring and creek fed lake with several small tributaries.

The lake watershed is 369 hectares of drainage basin and is much of it is privately owned and managed for timber supply.



Langley Lake watershed.

Water Treatment

All water supply systems using surface water are governed by Island Health and are required to adhere to provincial “4-3-2-1-0” 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 and Cryptosporidium
- 2 types of treatment processes
- 1 maximum Nephelometric Turbidity Units in treated water
- 0 detectable E. Coli, fecal coliforms and total coliforms in treated water

The journey from source to tap begins at the intake suspended above the bed of Langley Lake. Water enters the intake and flows along the dam on the NE side of the lake before travelling 3.8km to the water treatment plant.

When it arrives, it begins treatment by passing through a dissolved air flotation process that introduces a cloud of very small bubbles that carry particles to the surface where they are skimmed off.

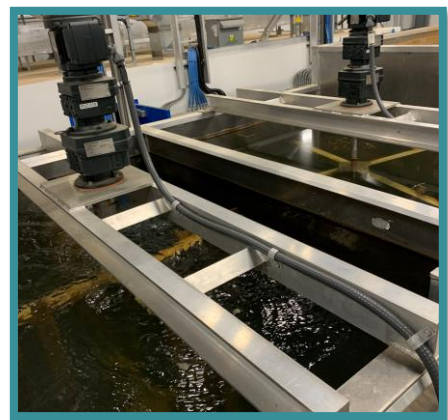
After this process, the water passes through a rapid gravity filtration media consisting of anthracite and sand to filter out any remaining particulate.

Finally, sodium hypochlorite is added for two purposes: to provide a final form of treatment, and to establish a residual disinfectant that persists in small amounts throughout the distribution network.

After disinfection, the water enters McLeod Reservoir which provides contact time for the sodium hypochlorite to disinfect any remaining bacteria.



Union Bay Water Treatment Plant



Flocculation tank mixers.

Water Distribution

Water leaves the reservoir at the treatment plant and some water is pumped to pressurize the upper zone of Green Avenue and Musgrave Road, and some water flows downhill, passing through two pressure reducing valves as it makes its way into the community.

The system extends along the coast to Kilmarnock Drive in the north, and to Buckley Bay Road in the south. Some water travels to McKay Reservoir which provides fire protection and storage capacity to the southern extremities of Union Bay. There are 80 fire hydrants and 736 service connections in the distribution system.



Nelson PRV.

Water Quality

The Ministry of Health, through its regional body Island Health, regulates municipal drinking water quality through the *Drinking Water Protection Act* and the *Drinking Water Protection Regulation*. Both documents set out certain requirements for drinking water purveyors to ensure the provision of safe drinking water to their customers.

The *Guidelines for Canadian Drinking Water Quality* are developed by the Federal-Provincial-Territorial Committee on Drinking Water and they provide a limit on microbial, chemical, physical, radiological substances called a “maximum acceptable 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.

The CVRD collects and analyzes weekly water quality samples from Langley Lake, at the treatment facility, , McLeod and McKay Reservoirs, as well as from various other strategic points within the distribution system to ensure that water is meeting regulatory objectives. Additionally, beyond the scope of this document, water from select locations is tested periodically throughout the year for over 200 different analytes to confirm the effectiveness of treatment processes, the quality of our source water, and the integrity of the distribution system.

Water Quality Summary

Source Water	2022	2023	
Turbidity (Average, NTU)	0.13	0.94	
Temperature (Average, °C)	10.9	11.1	
pH (Average)	6.5	6.5	
Distribution Water	2022	2023	Target
Turbidity (Average, NTU)	0.26	0.22	<1
Temperature (Average, °C)	11.7	11.7	<15
pH (Average)	7.4	7.4	7-10.5
Chlorine Residual (Average, mg/L)	0.91	0.46	0.4 \geq ≤2.0
Total Coliforms (Positive Samples)	0	0	0
E. Coli (Positive Samples)	0	0	0
Trihalomethanes (Average, mg/L)	0.007	0.02*	<0.1

*No trihalomethanes sample result was higher than 0.04.

Distribution Water - Data by Sample Site

Date	4583 Kilmarnock Drive		4600 Montrose Road		5096 Spence Road		5539 Island Highway S		5719 Green Road		310 Callis Road	
	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU
31-Jan	0.26		0.29		0.44		0.08		0.37		0.38	
07-Feb	0.28		0.38		0.50		0.75		0.59		0.32	
29-Mar									0.51	0.39	0.69	0.21
05-Apr	0.34	0.41	0.45	0.14	0.66	0.13	0.70	0.15	0.49	0.36	0.67	0.18
02-May	0.54		0.51	0.14	0.61	0.14	0.75	0.46	0.48	0.3	0.65	0.16
06-Jun	0.54	0.68	0.77	0.14	0.93	0.11	0.93	0.09	0.93	0.3	0.96	0.17
05-Jul	0.53	0.41	0.45	0.22	0.83	0.15	0.93	0.18	0.52	0.22	0.57	0.21
04-Aug	0.27	0.92	0.41	0.21	0.66	0.61	0.72	0.17	0.48	0.16	0.61	0.24
06-Sep	0.47	0.28	0.32	0.29	0.66	0.27	0.76	0.29			0.55	0.14
11-Oct	0.43	0.65	0.49	0.23	0.55	0.12	0.98	0.17	0.21	0.34	0.82	0.1
07-Nov	0.26	0.38	0.44	0.16	0.55	0.06	0.78	0.04	0.44	0.27	0.59	0.07
15-Nov	0.30	0.3	0.49	0.11	0.55	0.12	0.87	0.11	0.31	0.26	0.64	0.09
21-Nov	0.34	0.49	0.53	0.11	0.67	0.09	0.53	0.11	0.37	0.12	0.63	0.17
28-Nov			0.41	0.15	0.68	0.14			0.40	0.43		
04-Dec	0.47	0.25	0.47	0.13	0.61	0.09	0.67	0.07	0.46	0.34	0.63	0.09
14-Dec	0.37	0.92	0.46	0.12	0.63	0.07	0.63	0.06	0.41	0.22	0.64	0.09
21-Dec	0.31	0.8	0.42	0.17	0.62	0.2	0.62	0.06	0.42	0.4	0.57	0.4
28-Dec	0.71	0.61	0.61	0.49	0.67	0.39	0.04	0.49	0.34	0.46	0.71	0.13

Date	6500 Country Road		6258 Island Highway S		McKay Reservoir		Buckley Bay Ferry		491 Buckley Bay Road	
	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU	Cl ²	NTU
31-Jan	0.32				0.17		0.41			
07-Feb	0.22		0.22		0.36		0.34			
29-Mar	0.27	0.33	0.67	0.2	0.13	0.3			0.32	0.37
05-Apr	0.33	0.21	0.60	0.18	0.33	0.19	0.35	0.18	0.29	0.15
02-May	0.34		0.57	0.11	0.32	0.81	0.37	0.14	0.36	0.14
06-Jun	0.45	0.13	0.86	0.08	0.44	0.26	0.82	0.1	0.55	0.08
05-Jul	0.23	0.3	0.84	0.18	0.02	0.2	0.33	0.25	0.19	0.18
04-Aug	0.15	0.23	0.26	0.24	0.06	0.16	0.68	0.13	0.41	0.1
06-Sep	0.16	0.21	0.59	0.26	0.21	0.16	0.23	0.26	0.05	0.19
11-Oct	0.20	0.2	0.57	0.11	0.39	0.13	0.31	0.13	0.33	0.19
07-Nov	0.11	0.29	0.64	0.06	0.23	0.13	0.11	0.12	0.16	0.28
15-Nov	0.20	0.18	0.69	0.15	0.36	0.15	0.24	0.15	0.28	0.18
21-Nov	0.29	0.27	0.75	0.1	0.50	0.3	0.37	0.14	0.30	0.11
28-Nov										
04-Dec			0.64	0.08	0.42	0.12	0.35	0.13	0.24	0.21
14-Dec	0.30	0.14	0.71	0.17	0.32	0.39	0.23	0.09	0.23	0.14
21-Dec	0.28	0.31	0.59	0.15	0.42	0.21	0.38	0.22	0.22	0.15
28-Dec	0.37	0.22	0.74	0.18	0.44	0.26	0.49	0.18	0.37	0.21

Consumption Metrics and Water Rates

The average daily water production in 2023 was 710m³ per day. Demand is highest during the summer months - approximately twice as much as during the winter. In 2023, system demand reached its highest point on August 20th with 1120m³ of water being produced.

		2024	2025
Residential	Minimum charge up to 10m ³	\$66.74	\$68.41
	10m ³ to 25m ³	\$1.73/m ³	\$1.77/m ³
	25m ³ to 37.5m ³	\$2.35/m ³	\$2.41/m ³
	37.5 ³ to 50m ³	\$3.09/m ³	\$3.17/m ³
	Over 50m ³	\$4.64/m ³	\$4.75/m ³
Commercial	Minimum charge	\$46.25	\$47.40
	Cost per m ³	\$1.98/m ³	\$2.03/m ³

Conservation

Water conservation is an increasingly important initiative and while it seems as if there is an abundance of water available, our supply is truly a limited resource, particularly during the summer months.

The CVRD has a three-stage system in place for managing water consumption. Stage one is the least restrictive and comes into effect annually on May 1st until September 30th unless otherwise noted. Stage 2 is implemented when the water level in Langley Lake drops to elevation 151.53 m (0.64 m below the spillway crest). Stage 3 is implemented when the water level in Langley Lake drops to elevation 150.95 m (1.22 m below the spillway crest).

Union Bay Water System Watering Schedule

Residential lawn and garden watering is permitted during the specified days and hours as follows:

STAGE	STARTS	HOURS	Mon	Tues	Wed	Thu	Fri	Sat	Sun
1	Starting May 1	5-8 am & 7-10 pm	No Watering	Even Address	Odd Address	Even Address	Odd Address	Even Address	Odd Address
2	When Notified	5-8 am & 7-10 pm	No Watering	Even Address	Odd Address	No Watering	No Watering	Even Address	Odd Address
3	When Notified	N/A	No Watering						

For more information visit: comoxvalleyrd.ca/restrictions or call 250-334-6000.

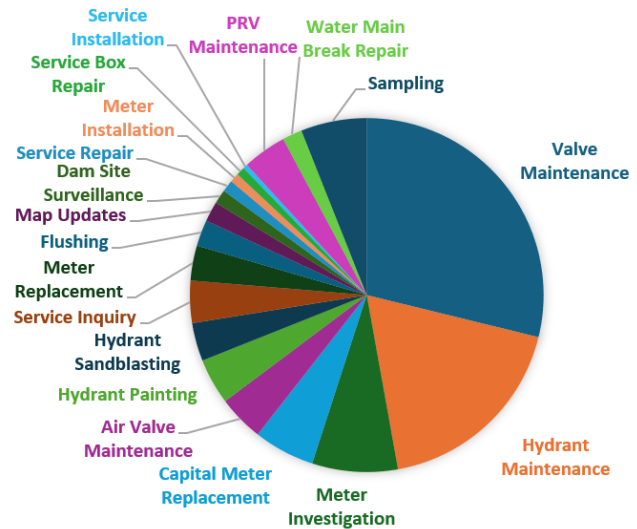


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Operations

The water treatment plant and distribution system are operated by 15 qualified operators. In 2023, several ongoing and annual maintenance activities were carried out, as well as improvements to work order tracking, data collection, and map improvements.

Additionally, many non-annual projects were completed such as reservoir cleaning, and hydrant painting.



2023 Achievements

- Dam safety review and remediation planning
- Completed the design and carried out an annual flushing plan for the distribution system
- Completed preventative maintenance projects (Fire hydrants, valve exercising, PRV and air valve maintenance)
- 3rd St. watermain installation
- 2 new sample stations installed

2024 Objectives

- Langley Lake dam upgrades as per 2023 report
- Nelson Rd Looping Project
- HWY 19-A 100mm watermain disconnects
- Water Treatment Plant upgrade design
- 2 new sample station installed