

Union Bay Public Works

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AGM **Public Works Report**

The Union Bay water distribution system went through a total of 199,690m³ of water in 2020. Our minimum daily recording was 309m³ on January 27th and our maximum daily recording of 1331m³ on July 20th. We are using 24% of our total license from Langley Lake at 809,203m³/year.

The water distribution system is constantly sampled for turbidity, pH, temperature and chlorine 24/7 from online analyzers. There are daily chlorine residual tests done throughout the distribution system. Ministry of Health water samples for coliforms are taken from raw water and the distribution system 3 days a week. All of the samples from the distribution system were negative in 2020 sent by VIHA to their lab. Water test results are posted on the Union Bay Improvement District website.

In 2020, there were 5 new service connections added to the system for a total of 679 residential connections. These are ¾ and 1" services that are hot tapped into the mainline and trenched to the property line where they are metered. There are also 18 commercial properties that pay a flat rate for the water at \$1.60/m³ for a total of 697 connections.

There were 4 more water leak repairs in the District in 2020 up to 21. Some very large leaks require excavators, Vac Trucks, dump trucks and flaggers. The pipe failures are to blame from poor construction methods 50 plus years ago when installed and some inexpensive materials used. We are seeing the number of leaks increase over the years and a pipe replacement plan will be required to address the aging infrastructure. The leaks come from Asbestos Cement (AC) pipe failure, corporation stops, service line splits, holes in the mainlines, failing copper, poly, and PVC pipes, and gasketed pipe failures.

Langley lakes water level did really well this last year staying on Level 1 water restrictions and only going down 34cm below the spillway on September 11th. The rains came in October and quickly saturated the forests and filled the lake by October 14th. This raised the raw water turbidity to 4.5 NTU but as we had our treatment plant operational there was no boil advisory for the winter of 2020. The turbidity slowly dropped over the winter to 2.0 NTU as of April of 2021.

The water treatment plant went 100% on-line May 15th, 2020 and was able to remove us from the boil advisory on May 27th, 2020 and produced water at 0.03Ntu to our customers and is also PH balanced. The water from the new reservoir (1750m3) supplies water at a higher pressure for the customers above 4th street that were in a lower pressure zone. The 2 new pressure reducing valves keep a consistent pressure the same as it was before for the houses in the high pressure zone. I would recommend have a look at our website for a look at the construction photos and updates.

There was a total of 13 street light repairs from 2020 throughout the entire community. It is very helpful when they are reported as the public works staff is not usually working in the night. A pole ID# or a physical address is helpful when reporting a street light failure. BC Hydro is working this year to replace the old high pressure sodium bulbs to new LED light for cost savings and improved lighting.

As we are moving into a new era with the transfer to CVRD and this being the last AGM for UBID I would like to thank all the staff for the help over the years. I started in April of 1999 just after my second daughter was born and working here has given my family a great place to call home, live and work in for 20 plus years. A special thanks to Gloria Royer and Keith McKay for the decades of work you have given the community. I hope the transition will be a benefit for Union Bay and the great community it is.

**Thank you
Respectively Submitted**

**Danny McGill
UBID Public Works Superintendent**

Annual Recorded Parameters from May 15th – December 31st, 2020

Water Quality Parameters

Water quality parameters are monitored 24/7 via inline analyzers and daily by UBID staff.

Water Quality Summary

Parameter	Range	Max. Target	Meets target
Distribution System			
• Chlorine residual end points	0.20 – 0.50 mg/L	0.20 mg/L	Yes
• Trihalomethanes	40 ug/L	100 ug/L	Yes
Filtered Water			
• Free chlorine	0.55- 1.45 mg/L	4.0 mg/L	Yes
• E.coli (positive samples)	0	No detectable per 100 ml	Yes
• Total coliforms (positive samples)	0	No detectable per 100 ml	Yes
Permit to Operate			
• Treated water turbidity (filtered)	0.020 – 0.089 NTU	0.30 NTU	Yes
• Recycled rinse turbidity	0.09 – 0.66 NTU	2.0 NTU	Yes
Canadian Drinking Water Guidelines			
• Temperature	12.9 – 19.8 Degrees Celsius	15 Degrees Celsius	Yes
• pH	6.79 – 7.89	7.0 – 10.5	Yes

Treated Water Volume Production

The reservoir has a storage capacity of 1,750 cubic meters / 1,750,000 million liters.

May 15 th - 30th	June	July	August	September	October	November	December
9,454	17,385	24,660	22,660	15,905	12,315	15,042	15,403

Works & Plans in 2020

Works

- Additional signage in watershed – July
- Transmission line to plant – flushed in October
- Distribution system – flushed in November
- DAF train drained and cleaned – November

Plans

- Information article, see appendix.
- Updated Emergency Response Plan
- Increased information to landowners on website
- COVID Safety Plan, link [here](#).

Photos



Langley Lake, November 2020

New water filtration plant delivers high quality drinking water in Union Bay

Residents on the east side of Vancouver Island in the Union Bay Improvement District (UBID) are the first in the Comox Valley to get their drinking water from a multi-barrier water filtration plant. UBID draws its drinking water from Langley Lake via a two-kilometer transmission line where previously chlorine had been the primary method to disinfect the water. An underground reservoir stored the water before sending it via gravity feed to the distribution system. With only one barrier to protect the drinking water, the former treatment system was left vulnerable to events that could create turbidity in the watershed.

Potable water standards are enforced by Island Health through a Permit to Operate that outlines the operating terms and conditions for each individual water system. The water treatment system in Union Bay no longer met the terms outlined by Island Health and was apparent that an upgrade to the system would be required.

UBID manages the water withdrawal license issued by the Ministry of Forests, Lands and Natural Resource Operations. In partnership with Mosaic Forest Management, the watershed is monitored for activity and any changes to water quality and quantity.

In 2007, Island Health adopted the 4-3-2-1 policy aimed at ensuring consistent standards for all surface water supply systems on Vancouver Island. The policy requires surface water supply systems to maintain the following treatment specifications:

- 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; and
- 1 NTU turbidity (maximum) in finished water.

Union Bay's water system required an upgrade to meet these standards. With the use of chlorine as the only treatment method used to treat the water, the introduction of a filtration process was a necessary step to meet the regulatory standards. In 2014, the Permit to Operate required the construction of a water treatment plant in order to meet Island Health's water quality objectives outlined in the 4-3-2-1 policy. UBID has worked diligently with Island Health to fulfill these Terms and Conditions and the new water treatment plant has been providing water to all end users as of May 15th, 2020.

The construction of a new water treatment plant for Union Bay started with the acquisition of the land, a \$1 purchase from Union Bay Estates in 2018. Once land was secured, engineering firm Koers And Associates Engineering Ltd. was retained to develop the scope of work and conceptual design and produce the preliminary design drawings for the request for proposal. After a full review of all submitted proposals, Ridgeline Mechanical Ltd was awarded the construction bid with AWC Process Solutions Ltd. supplying the treatment portion of the water treatment plant.

Once the plant was built, there was a commissioning period to ensure that the plant was operating as per designed. The facility is fully operated by certified UBID public works staff.

To view the construction reports, click [here](#).

Water quality is significantly improved compared to the water quality from the former system. The new facility added several additional treatment steps to deliver drinking water that exceeds provincial and federal standards. The first step in the process is the flocculation and coagulation of particles, step two is a dissolved air flotation (DAF) process to remove the organics and colour particles, step three dual media filters to purify the water, and then goes to the clearwell. From the clearwell, the addition of sodium hydroxide for pH adjustment and a 12% chlorine solution is added to ensure that the water satisfies, and exceeds, regulatory water quality standards/parameters. Chlorination and pH-adjustment add disinfection and corrosion control as the water travels through the distribution network.

Under current operations, filtered water is being sent to the clearwell at a turbidity level of 0.03 NTU. Anything higher than 0.3 NTU and the water is sent into the backwash cycle rather than to the clearwell and storage tank. The above-ground reservoir can hold up to 1,750 cubic metres, which has increased the storage capacity of the old system three times.

For a detailed description of the plant processes, click [here](#).

Since the facility has been online and providing water to the Union Bay Improvement District's end users staff have been testing the water quality daily at the plant and taking weekly microbiological samples to an accredited lab. The entire system is monitored 24/7 for all processes, functions and water quality monitoring. The new water treatment process is providing the highest quality water possible.

Due to WorkSafe considerations for staff there are no public tours being offered at this time.