

GRAHAM LAKE IMPROVEMENT DISTRICT

2018 OPERATORS REPORT



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Enrico Wauri - Operator
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2018 – The Year in Review

2018 can be characterized as having been a fairly typical year from the Operators' perspectives. You'll see later in the report that water demand / treatment volumes were in keeping with the ranges that GLID has experienced over the past 10 years. There were no adverse water quality issues although elevated summer lake water turbidity kept the operators unusually busy backwashing filters. Bulk water filling also required additional operator time to manage disinfectant residual levels. System operations and maintenance costs returned to levels that we typically experience (which is in contrast to 2017 where we saw significantly higher maintenance costs).

In addition to routine operations, 2018 also saw the successful completion and introduction of GLID's Emergency Response and Contingency Plan (ERCP). This document is a requirement of the BC Drinking Water Protection Regulation and must be updated annually. Our updates have recently been completed and will be posted to our web site and submitted to VIHA with in the near future. Our ERCP has received complementary reviews from staff at the Union Bay Improvement District, the Comox Valley Regional District, and our former Drinking Water Officer suggested it was the new standard by which to judge other small water system ERCPs.

We have established a productive working relationship with Pam Kumar, VIHA's Environmental Health Officer (EHO), who has recently replaced our former EHO, John Hillis. Our relationship with VIHA is very important – and having access to and support from Pam Kumar is a real asset for GLID.

And finally, we've successfully navigated the transition from working with GLID's Manager/Treasurer/Secretary (Simon Palmer) to an expanded GLID team that now includes 4 new volunteers in the roles of Chair, Manager, Treasurer and Secretary.

Regulatory

Water system operators are required to provide VIHA with an annual drinking water system report and to make it available to the public. Our "2018 Drinking Water System Annual Report" has been filed with VIHA and a copy will be available on the GLID website.

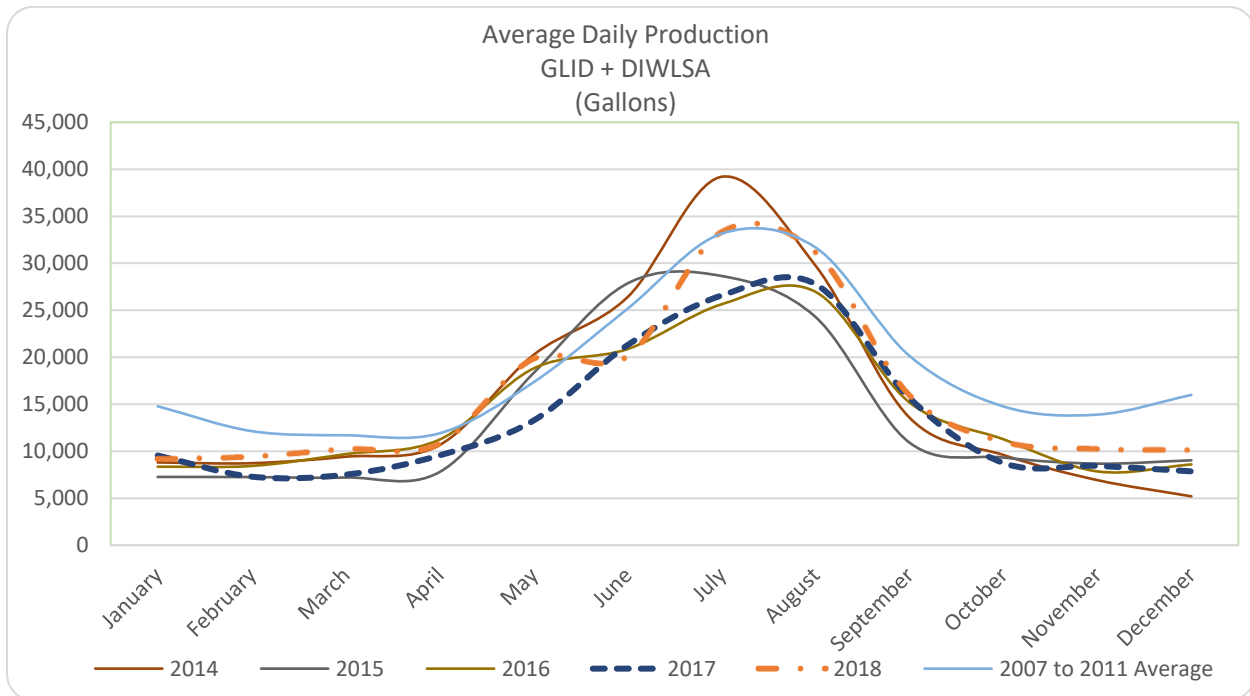
2018 Treated Water Production

Graham Lake Improvement District (GLID) treated 5.8 million gallons of water in 2018. This represents an increase of approximately 17% over the volume of water treated in 2017. While the volume of water treated in 2018 was higher than 2017, the 2018 volume was 5% below GLID's 10-year historical average volume.

Of these 5.8 million gallons, approximately:

- 78% was consumed by GLID property owners
- 12% was consumed by DIWLSA users
- 2.5% was provided to the bulk water hauler, and
- the remaining 7.5% was flushed at the south end of the DIWLSA line to help prevent stagnation and improve disinfection residuals. While this may seem significant, it is approximately one third of the amount of water that was flushed with our previous treatment system.

The 5.8 million gallons of treated water produced in 2018 represents approximately 38% of GLID’s annual aggregate allowable withdrawal against our water licenses of 15.4 million gallons.



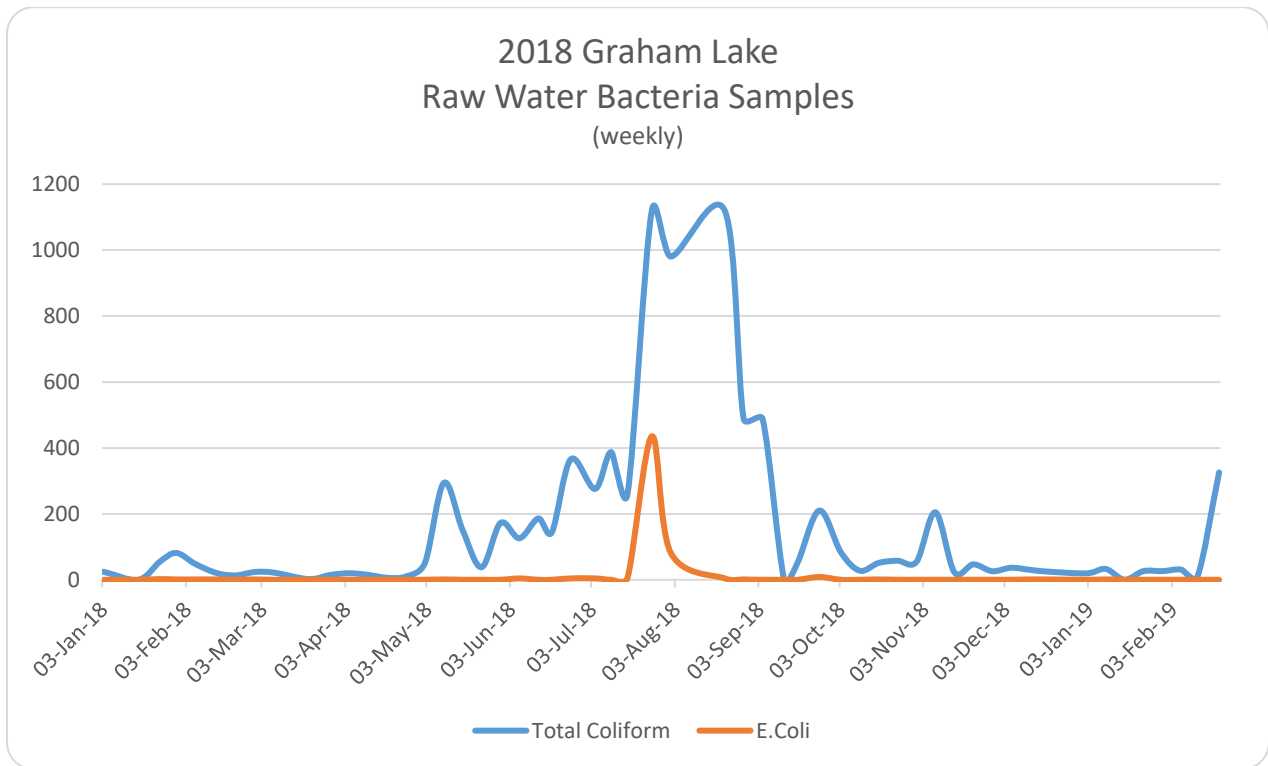
Water Safety and Quality

Bacteria Sampling

Schedule B of the Drinking Water Protection Regulation requires that we submit 4 water samples per month to VIHA for bacteriological analysis. Each week, two samples of treated water are taken from our sampling points at 4356 East Road, and 5326 East Road and delivered to the VIHA office in Courtenay.

Of the samples submitted to VIHA in 2018, one of the two August 8th samples was overgrown, meaning: ‘too many background bacteria to give an accurate count’. We hypothesize that this was the result of a sampling or lab error. Follow up samples were immediately taken from our two distribution sampling points and from the pump house and sent to Maxxam Labs for rush analysis. All three samples came back free of bacteria.

Additionally, we sample raw lake water from the pump house and submit this for bacteriological analysis. This helps us maintain our awareness of current lake conditions. Of the 47 raw water samples collected from the pump house in 2018, 96% had positive results for coliform bacteria and 38% were positive for e. Coli. This shows the importance of maintaining appropriate disinfection residuals throughout our distribution system.



Disinfection Monitoring and Management

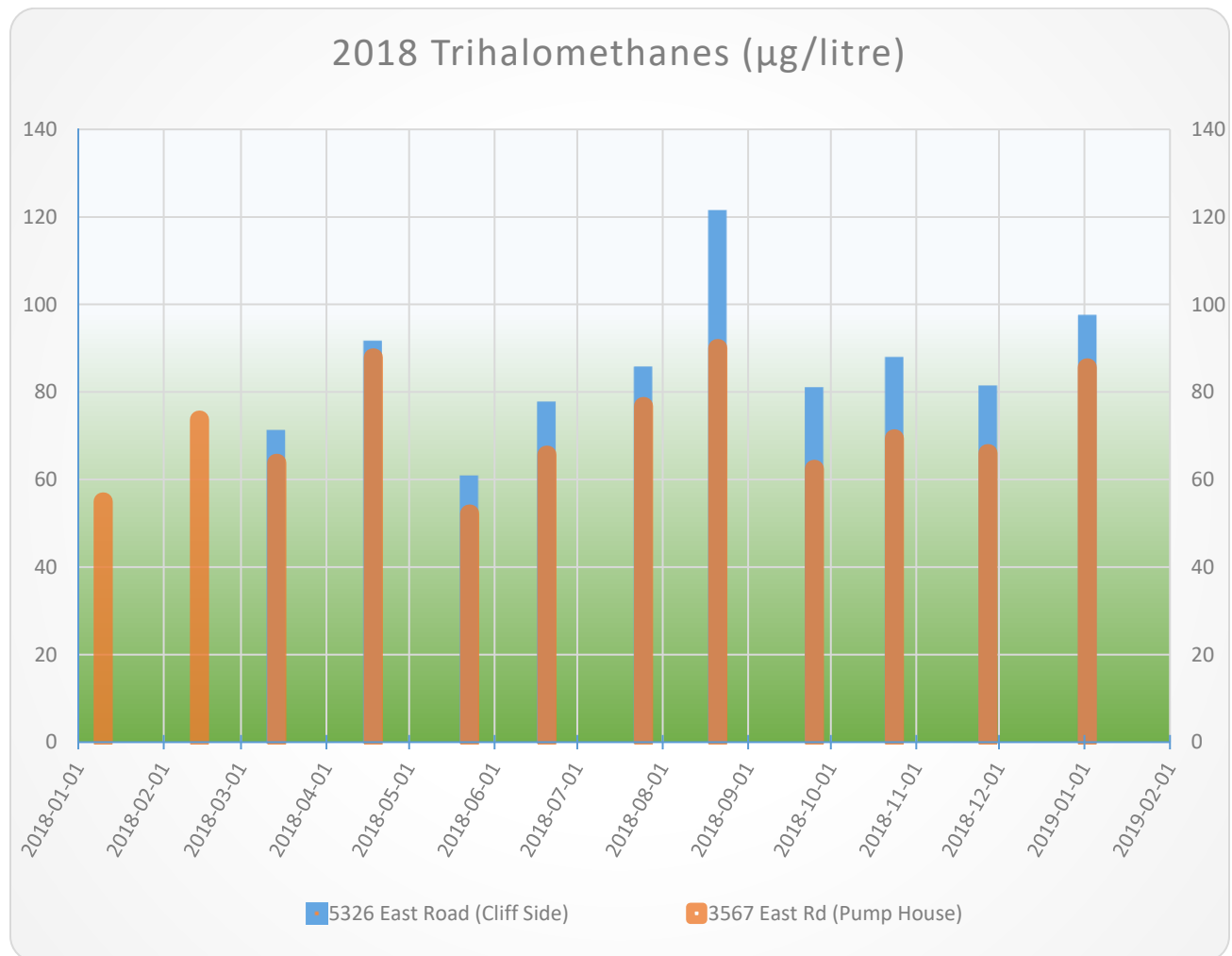
Improvements in disinfectant residual monitoring and management have allowed us to reduce by two thirds the amount of ammonium sulphate used to produce monochloramine, which acts as a secondary disinfectant in our distribution system. This results in savings of approximately \$1,100 annually for the purchase of ammonium sulphate.

Consistent disinfectant residual levels at our sampling point at 5326 East Road (Cliffside) have allowed us to trial a 50% reduction in nightly flushing, which is ongoing.

THMs

Trihalomethanes (THMs) are disinfection by-products that can be created when organic materials in raw water from Graham Lake are exposed to chlorine in our water treatment plant. Monthly samples are taken from our pump house and in March 2018 we began sampling from our sample point at 5326 East Road. The maximum acceptable concentration for THMs in drinking water is 100 µg/L based on a running annual average of a minimum of quarterly samples taken at the point in the distribution system with the highest potential THM levels. Our running annual averages are as follows:

- 70.71 µg/l 3567 East Rd (Pump house)
- 81.21 µg/l 5326 East Road (Cliffside)

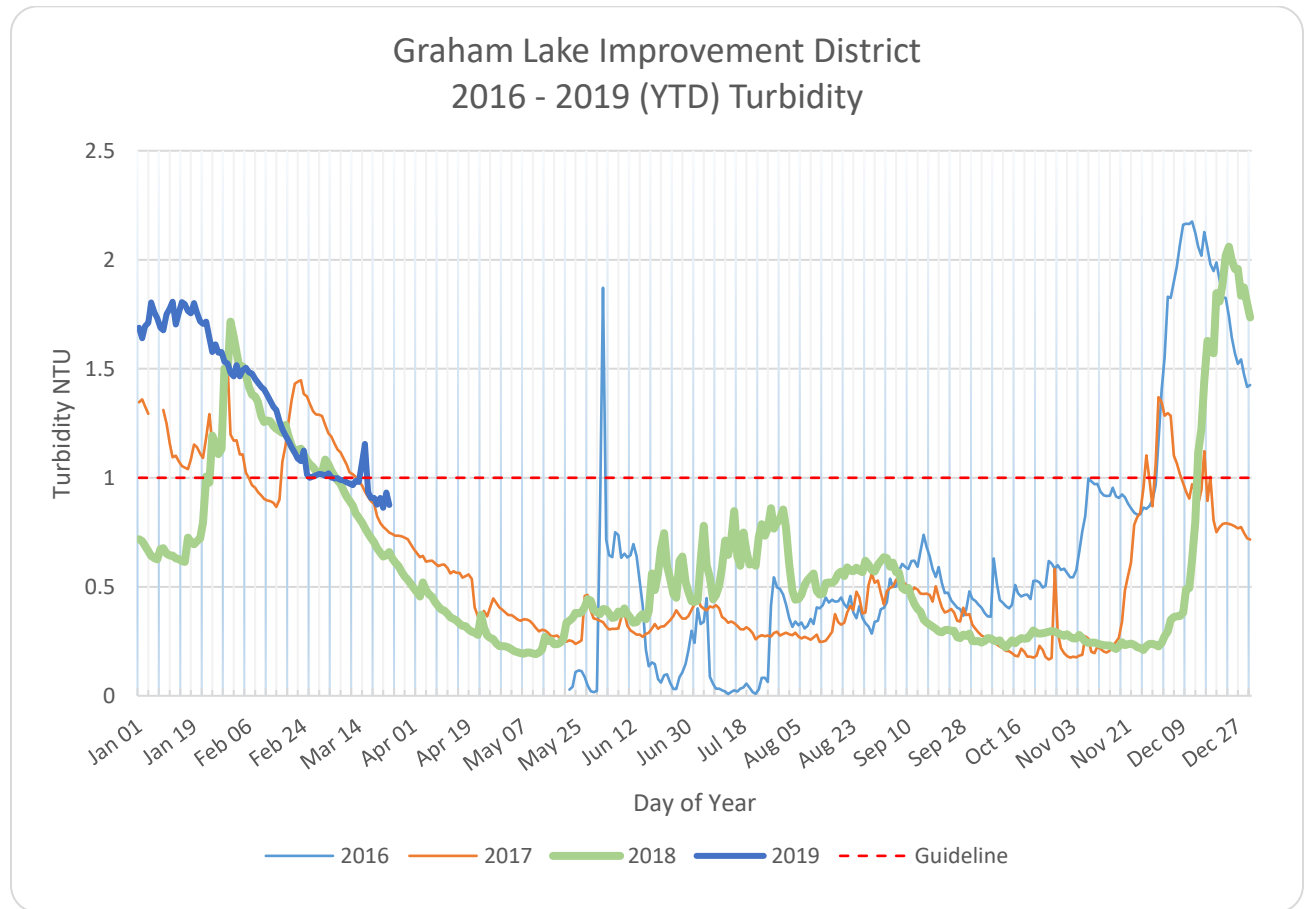


Turbidity

“High turbidity can interfere with the disinfection of drinking water by causing ultraviolet light and/or chlorination processes to become ineffective in destroying pathogens. Turbidity events can also be linked to an increase of disease-causing micro-organisms in the source water. The turbidity objective for drinking water from surface water supplies is less than 1.0 NTU.” – VIHA

Turbidity exceeding 1.0 NTU is common for the Graham Lake Improvement District during the fall and winter months.

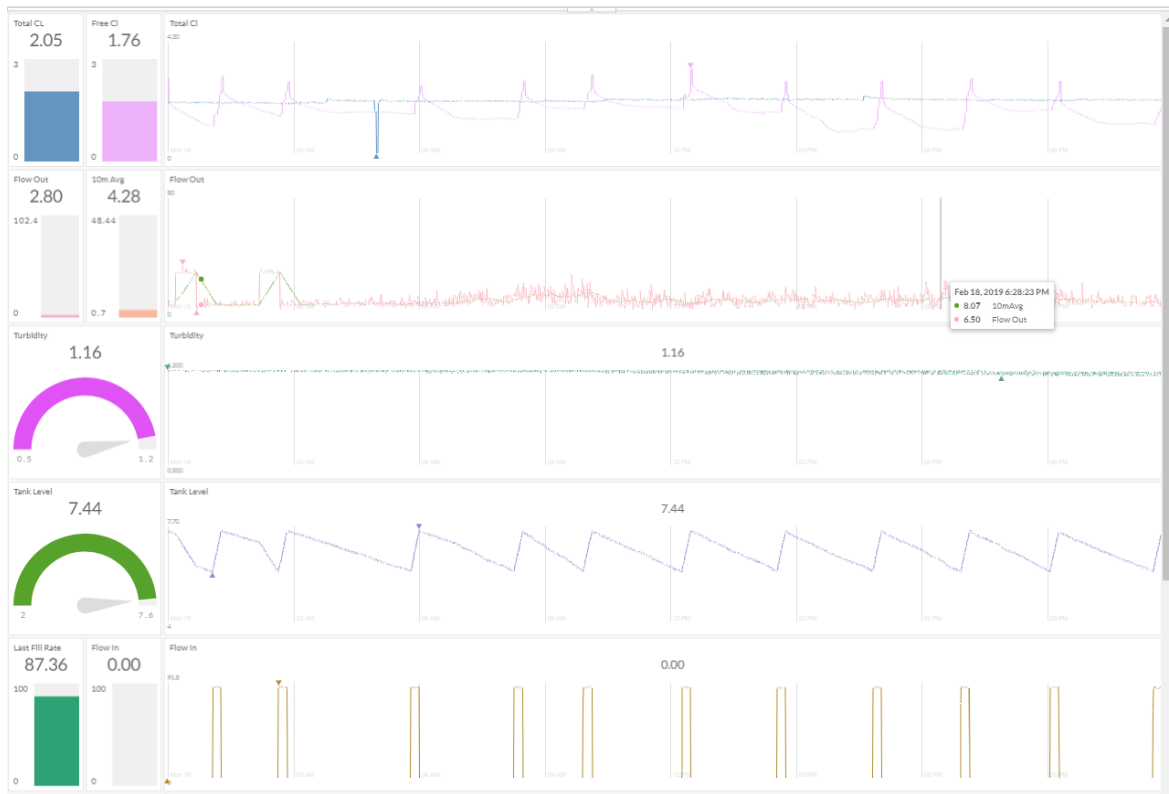
In 2018 our turbidity exceeded 1 NTU for 60 days with an average annual daily turbidity of 0.6 NTU.



Remote Monitoring

Remote monitoring continues to play an important role in GLID’s pump house operations. Preprogrammed alarms alert us to abnormal pumphouse conditions and real time trending data permit us to examine parameters preceding abnormal events.

This has allowed us to detect and manage distribution leaks, pump failure, bulk water fills, and low residual events, long before they create critical situations.



APPENDICIES

Vancouver Island Health Authority Links

- [VIHA Inspection and water testing range reports](#)
- [VIHA Water test results](#)

Water Licenses

GRAHAM LAKE IMPROVEMENT DISTRICT WATER LICENSES

License	Issued	Purpose	Precedence Date	G/Year	M ³ /Year
C67571	1988 Mar 31	Waterworks	1970 Mar 19	10,950,000	49,780
C67572	1988 Mar 31	Waterworks	1985 Feb 21	1,095,000	4,978
C67573	1988 Mar 31	Storage	1983 Mar 25	10,310,462	46,872

COMOX VALLEY REGIONAL DISTRICT (DIWLSA Addition)

C124755	2009 Nov 17	Waterworks	2009 Apr 17	3,376,528	15,350
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Total Available Withdrawals				15,421,528	70,108
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