



City of Courtenay 2018 Annual Drinking Water Quality Report



CITY OF
COURTENAY
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1. Introduction

In 2003, the Provincial Government passed legislation that brought into effect the *British Columbia Drinking Water Protection Act* (the Act) and the *Drinking Water Protection Regulation* (the Regulation). The Act and Regulation detail municipal responsibilities as a water supplier.

The Act covers all water systems other than single-family dwellings and systems excluded through the regulation. It outlines requirements for water suppliers in terms of ensuring that the water supplied to their users is potable — and meets any additional requirements established by the Regulation or by the water supply system's operating permit, as set by the local drinking water officer. The Regulation sets out requirements for drinking water quality including treatment, construction and operation of water systems, monitoring, reporting, and public notification for water quality advisories.

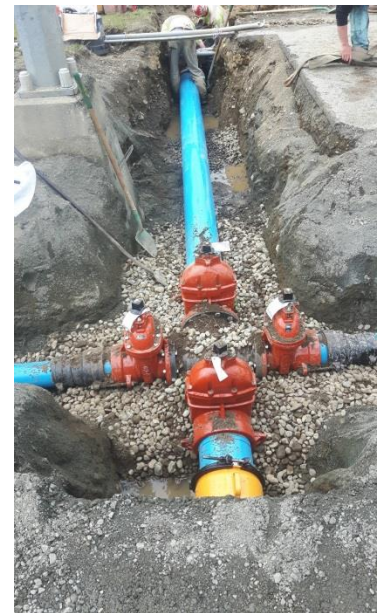
The City of Courtenay (the City) supplies potable water to approximately 25,000 residents and ICIA customers within City boundaries. The City has a bulk water agreement in place to purchase water from the Comox Valley Regional District (CVRD).

2. General Description

The City operates and maintains a Class IV Water Distribution System. This system is designed to adequately supply water to its end users and in the event of an emergency provides the required flow for fire protection.

The City's water system consists of:

- 170 km of water mains;
- 730 hydrants;
- 4 pressure reducing valves;
- 2150 mainline valves; and
- 1 booster station containing 5 pumps.



3. Island Health

Island Health administers the Act and the Regulation. The Drinking Water Officer is responsible for issuing operating permits and monitoring compliance of drinking water systems. In BC the surface water treatment objectives for microbiological parameters are:

- 4 log (99.99%) removal or inactivation of viruses;
- 3 log (99.9%) removal or inactivation of *Giardia Lamblia* and *Cryptosporidium*;
- 2 treatment processes in place;
- 1 NTU or less turbidity in finished water; and
- 0 detected *E.coli*, total and fecal coliforms.

The City of Courtenay is required to meet these objectives under their operating permit.

4. Source Water

The water provided by the CVRD is sourced from Comox Lake and collected from the Puntledge River at the BC Hydro penstock. Water travels from the penstock via two transmission pipelines to the CVRD's chlorination station where it is metered, sampled and chlorinated.

4.1 *Source Water Quality*

In 2018 the CVRD installed an interim ultraviolet (UV) treatment system. Island Health approved a change to the CVRD's operating permitting allowing source water turbidity to reach 3 NTU before a boil water advisory is required.

The CVRD is in the planning stages to construct a new deep water intake in Comox Lake and a treatment plant that includes filtration to meet the Surface Water Objectives by 2021, as required by Island Health.

4.2 *Source Water Testing*

Quality of the source water is monitored and tested by the Comox Valley Regional District. The CVRD water quality report for 2018 can be found on their website.

<http://www.comoxvalleyrd.ca/services/water/water-quality-reports-studies>

4.3 *Transmission System*

Water supply is distributed to two reservoirs in Courtenay via large transmission mains all owned and operated by the CVRD. The Courtenay East reservoir is located off Ryan Road, the Courtenay West reservoir is located on Lake Trail Road. These reservoirs connect with the City's distribution mains to transport water to residential, commercial and institutional water services.

5. Distribution Sampling

In order to ensure water quality standards and regulations are met the City continuously tests the water quality throughout the distribution system. Under guidance from Island Health the City has installed a series of water sampling test points. The City completes weekly sampling and submits the samples to Island Health for testing.

If a sample shows evidence of Total Coliforms and/or E.coli, the Lab will immediately contact, by phone, both the City Public Works and Island Health in keeping with the requirements of the *Regulation*.



5.1 *Sample Requirements*

The *Regulation* requires the City to take a minimum number of samples per month based on the following population figures:

- Less than 5,000 4
- 5,000 to 90,000 1 per 1,000 population
- More than 90,000 90 plus 1 per 10,000 population in excess of 90,000

5.2 *Sample Stations*

The City has eleven sample stations located throughout the distribution system with varying flow patterns, rates and conditions. In 2018 a new station was added on Hurford Avenue to increase coverage of the distribution system within the City. See Figure 1 for sample station locations.

5.3 *Distribution Sampling Overview*

The City's current population mandates a minimum of 26 samples to be collected and tested each month. Sampling frequency and locations continue to meet the monitoring protocol set out by Island Health.

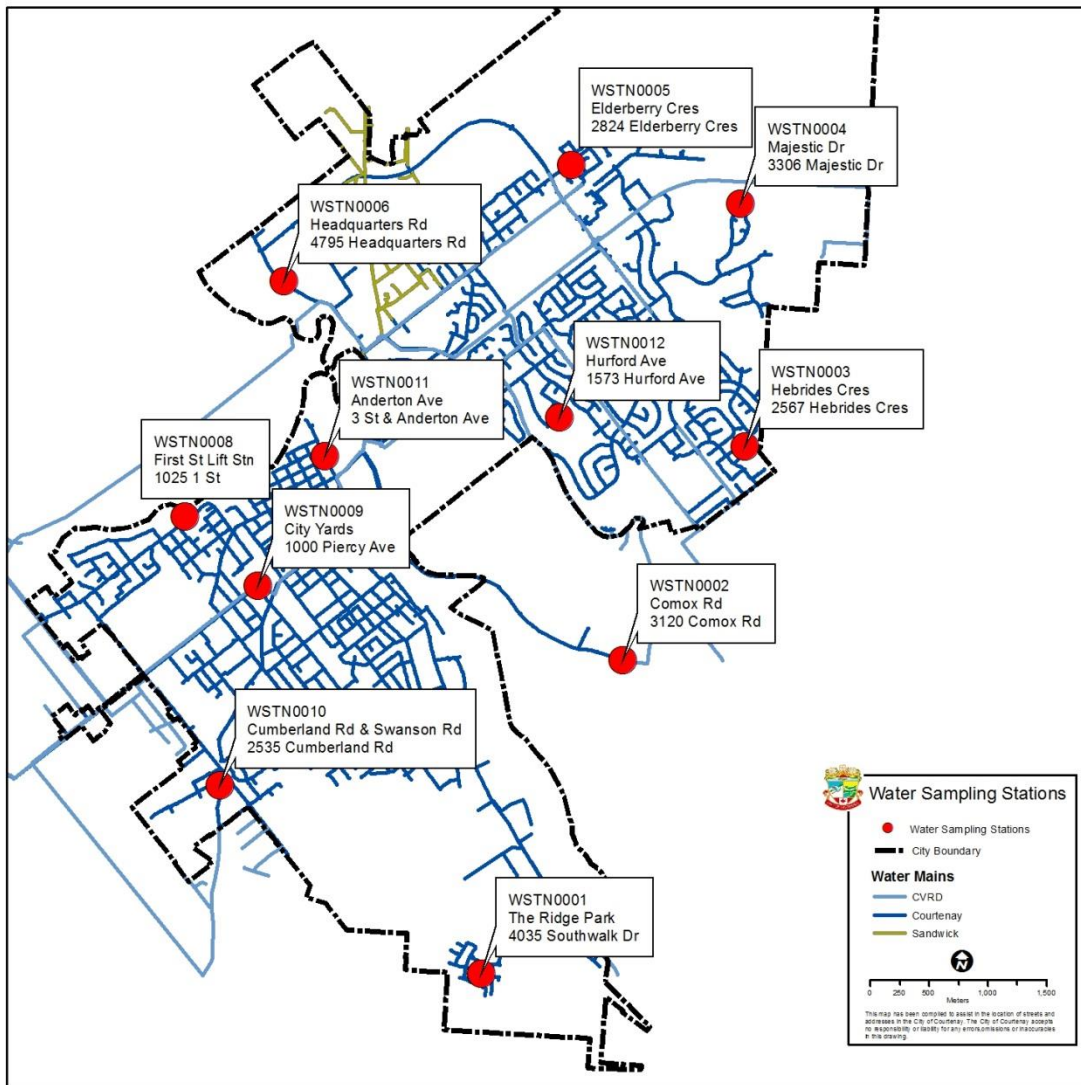


Figure 1.
Sample Station
Locations.

6. Standards & Regulatory Distribution Testing

The *Regulation* requires a supplier to collect and test samples from the distribution system. The British Columbia Center for Disease Control Laboratory in Vancouver analyzes all water samples sent by Island Health.

Water sampling results for 2018 can be found on the Island Health website:

https://www.healthspace.ca/Clients/VIHA/VIHA_Website.nsf/Water-Samples-Frameset?OpenPage

6.1 *Distribution Testing Parameters*

Physical and bacteriological parameters are collected, sampled and tested from each of the City's sampling sites; 5 sites are sampled weekly, 6 are sampled on a rotating biweekly schedule.

6.1.1 Physical Parameters

- Free chlorine residual measured in milligrams per litre (mg/L)
 - Guideline is 0.2mg/L
- Turbidity measured in nephelometric turbidity units (NTU)
 - Guideline is 1 NTU

6.2 Free Chlorine Residual

In order to control the re-growth of bacteria in the distribution system it is important to maintain a disinfectant residual. The minimum disinfectant residual of 0.2 mg/L (milligrams per liter) free chlorine is maintained.

6.2.1 Results

In 2018, 364 samples were collected and tested; 3 samples fell below the benchmark of 0.2mg/L of free chlorine residual.

6.3 Turbidity

Turbidity is a valuable indicator of water quality. Turbidity is a measure of the cloudiness of water caused by suspended particles given in NTU. The measurement is a quantification of the scattering and absorption of light by these suspended particles; the higher the turbidity the cloudier the water. Water with high turbidity may shield harmful organisms which increases disinfectant demand.

In 2018 the CVRD installed UV treatment as an interim measure pending construction of the water treatment plant. With the UV in place VIHA approved an increase from 1 NTU to 3 NTU of source water before a boil water advisory is required.

6.3.1 Results

In 2018, average turbidity within the distribution system was 0.52 NTU. There were no boil water advisories issued.

6.4 Total Coliforms & *Escherichia coli*

Total coliform and *E. coli* are typically used as indicators for overall drinking water quality. The *Regulation* established the parameter and standards for the microbiological quality of water.

6.4.1 Total coliform bacteria

- Standard:**
- (a) 1 sample in a 30 day period
No detectable total coliform bacteria per 100 ml
 - (b) More than 1 sample in a 30 day period.
At least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

6.4.2 *Escherichia coli*

- Standard:** No detectable *E. coli* per 100 ml

6.4.3 Results

In 2018, 2 samples in the City of Courtenay tested positive for total coliforms which is attributed to sampling error; no samples tested positive for *E.coli*.

7. Unidirectional Flushing Program

The City of Courtenay's Unidirectional Flushing (UDF) program is aimed to enhance the overall water quality within the water distribution system and improve systems operations by: reducing turbidity, removing sediment, silt and biofilms, lowering chlorine demand, increasing system hydraulic capacity and increasing the life of system components. This program supports the City's Asset Management System as it allows for in situ condition inspections of the water system and helps maintain water infrastructure integrity, thus increasing the service life of the system and its appurtenances. In 2018 the UDF program completed flushing in Area 8, Area 9, and Area 10 (see Figure 2). For each run turbidity, static/residual hydrant pressure, and flushing time data was collected.

Area 8. A total of 14 km of watermain was flushed in a series of 29 runs. Flush times ranged from 24-66 minutes with an average time of 40 minutes. Turbidity readings ranged from 0.8-1000 NTU, with an average of 83 NTU.

Area 9. A total of 9 km of watermain was flushed in a series of 24 runs. Flush times ranged from 15-45 minutes with an average time of 25 minutes. Turbidity readings ranged from 0.8-1000 NTU, with an average of 139 NTU.

Area 10. A total of 3 km of watermain was flushed in a series of 8 runs. Flush times ranged from 10-40 minutes with an average time of 20 minutes. Turbidity readings ranged from 0.7-103 NTU, with an average of 20 NTU.

8. Cross Connection Control Program

The City of Courtenay's Cross Connection Control Program is aimed to reduce risks and the likelihood of contamination by eliminating or controlling unprotected cross connections within the potable water system. The program will be implemented in stages; initially the program will be focused on City-owned assets, buildings and facilities and will then be expanded to include Industrial, Commercial, Institutional and Agricultural (ICIA) customers. See Table 1 for the five year implementation plan.

In 2018 the City of Courtenay Water Technician was certified as a backflow inspector through MTS in Vernon.

Table 1. Cross Connection Control Program Implementation

| Year | Program Actions |
|------|---|
| 2019 | Conduct City-owned facility inspections and complete replacement/repair/testing of existing devices and complete new installs. |
| 2020 | Continue with City program, develop and adopt Cross Connection Control Bylaw, and develop education and outreach program for ICIA customers. |
| 2021 | Deliver ICIA education program, identify severe and moderate hazard customers, schedule inspection surveys to confirm level of protection required and provide surveys to customers for device installation. Develop residential cross connection awareness campaign. |
| 2022 | Continue with ICIA program, once severe and moderate level hazard inspections are complete follow with minor level hazard customers, provide surveys to customers for device installation. Deliver residential awareness campaign. |
| 2023 | Continue with ICIA program, ICIA and residential education and outreach program, and ongoing program management. |

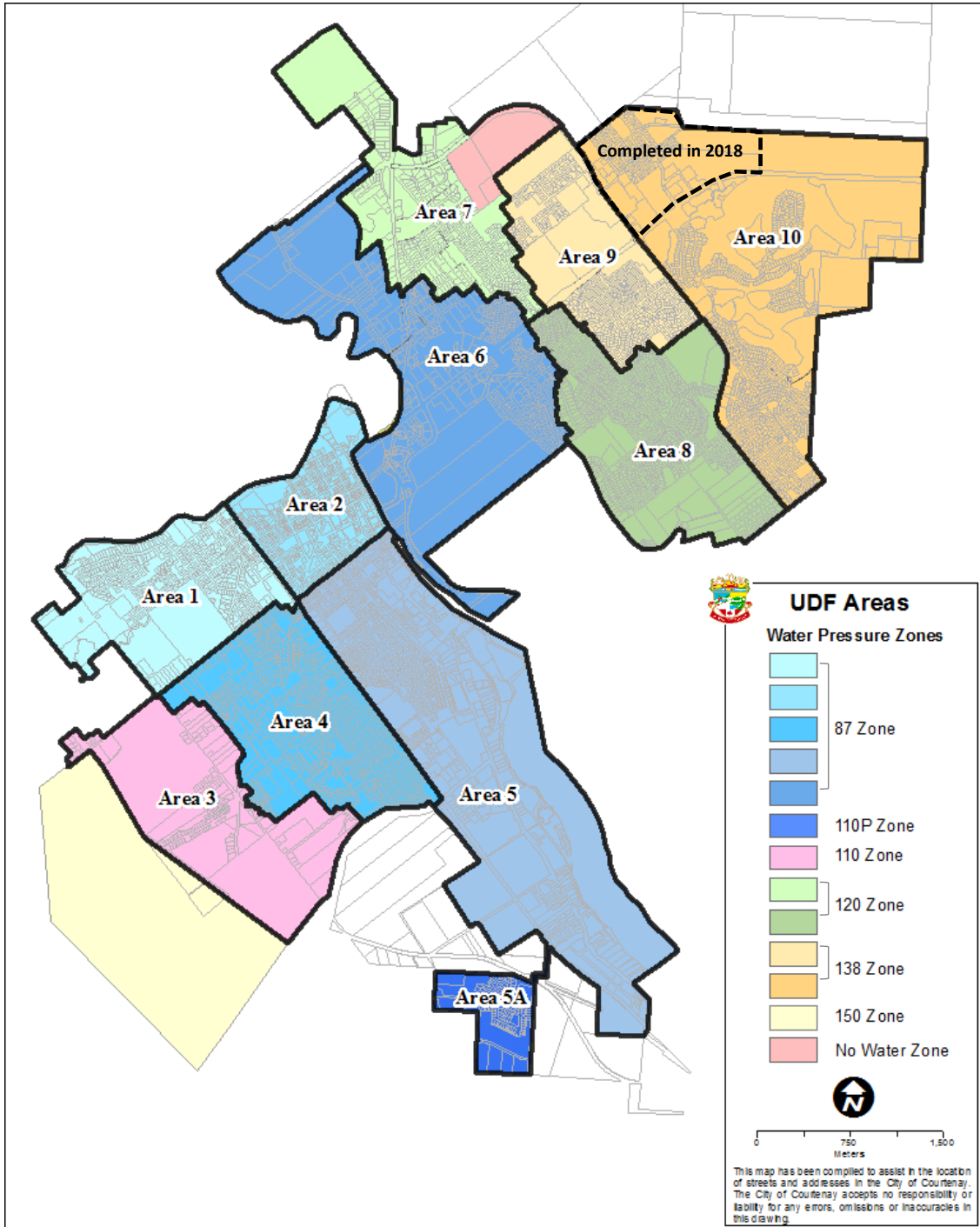


Figure 2.
UDF Areas.

9. System Improvements

The City continues to make improvements to the overall distribution system and its appurtenances. Projects are identified and prioritized within the Asset Management Program enabling sound financial planning to maintain and enhance level of service to the community.

System Improvements in 2018 included:

- Watermain replacement on 17th Street between McPhee Ave and Lewis Ave - ~65 m of 150 CI was replaced with 150 PVC.
- Watermain replacement on 20th Street – ~140 m of 150 AC was replaced with 200 PVC and 150 PVC.
- Watermain replacement on Willemar Avenue - ~530 m of 150 CI was replaced with 300 PVC.
- 5th Street Complete Street Project –this project included replacement of water, storm and sewer mains. ~500 m of 300 CI watermain was replaced with 300 PVC.
- Pressure reducing valve chamber decommissioning on Old Island Highway at Puntledge Road.
- Hydrant installation project on Lerwick Road – 4 hydrants were installed to comply with FUS requirements.
- Design of Beachwood Booster Station improvements to support Phase 3A development of Buckstone neighbourhood. This project will be completed in 2019.
- Sandwick Waterworks District conversion project. The construction for this project was initiated in 2018 and will be completed in 2019.

10. Operator Qualifications

The Environmental Operator Certification Program (EOCP) is a not-for-profit society that oversees the certification of water and wastewater operators in BC. A Class IV Distribution System is required to have 1 Water Distribution Level IV Operator on staff. The City has 11 EOCP-certified water operators with the following qualifications:

- Water Distribution I - 2 certified employees
- Water Distribution II - 7 certified employees
- Water Distribution IV - 2 certified employees
- Water Treatment I - 1 certified employee

11. Emergency Response Plan

The *Emergency Response Plan* has been prepared to provide staff with an effective plan to respond to an emergency related to the City's water distribution system.