CRESTON VALLEY

TOWN of CRESTON

2023 Annual Water Report

CRESTON VALLEY
TOWN of CRESTON

Table of Contents

1.0 INTRODUCTION

The Town of Creston is the purveyor of potable drinking water to users connected to the Town of Creston community water system. This report is provided in fulfillment of the Town's obligations under the *Provincial Drinking Water Act* and associated regulations, as well as the terms and conditions of the Town's Water System Operating Permit. Enforcement of the regulations and issuance of water system permits are the responsibility of the Interior Health Authority.

2.0 TOWN OF CRESTON WATER SYSTEMS

The Town of Creston has 3 separate water sources available to provide drinking water to the community.

The primary supply of potable water is delivered from the Arrow Creek Water Treatment Plant that is operated by the Regional District of Central Kootenay (RDCK). The water system derives source water from Arrow Creek, which is classified as a Community Watershed, supplying water to both Erickson and Creston. The creek has benefited for several years from an ongoing water quality monitoring program. Historic water quality data for Arrow Creek indicates that, in general, the water quality falls within acceptable levels for the majority of parameters in the Canadian Drinking Water Quality Guidelines. Coliform levels, however, typically exceed the criteria and exhibit high seasonal variability.

Although the water system was first developed in 1929, unsafe water quality issues due to the inadequate treatment processes resulted in a new water treatment plant being commissioned on Arrow Creek in 2005. The $9.3 million treatment process includes coarse screening, settling, fine screening, membrane filtration, UV disinfection, and residual disinfection by chlorination.

Arrow Creek Ultra Violet Disinfection Equipment

An indication of the effectiveness for the Arrow Creek Water Filtration Plant, which utilizes a Zenon Hollow-Fiber Ultra Filtration process, are listed below:

Number of filter trains	4	
Number of cassettes per train	3	(with space for one additional)
Total number of cassettes	12	(with space for four additional)
Number of modules per cassette	69	
Total number of modules	828	
Number of fibers per module	29,000	
Total number of fibers	24,012,000	
Membrane surface area per module	37.16	(square metres)
Total membrane surface area	30,768	(square metres)
Single fiber outside diameter	700	(microns) (= 0.7 mm)
Single fiber inside diameter	400	(microns) (= 0.4 mm)
Single fiber sidewall pore diameter	0.02	(microns)
Human hair diameter	76	(microns)

Filtration Plant Minimum Requirement for Permeate (Filtered Water)		
Maximum turbidity	0.1 NTU	(Nephelometric Turbidity Unit)
Turbidity	<.05 NTU 95% of the time	
Giardia removal	>4 log removal	(99.99%)
Cryptosporidium removal	>4 log removal	(99.99%)
Virus removal	>3.5 log removal	(99.99%)
Plant capacity	20 million litres per day	(when raw water is 5 deg. C)
	30 million litres per day	(when raw water is >10 deg. C)

Water from Arrow Creek accounts for over 99% of the current potable water supply for the Town of Creston. The treated water is monitored for free chlorine residual as it enters the main Creston reservoir, and an automated chlorination dosing system compensates for any low chlorine residual that may be present, ensuring safe disinfection for Creston consumers.

Arrow Creek Raw Water Supply

Additionally, the Town of Creston maintains two potable groundwater wells within the confines of Creston itself that are independently capable of providing an adequate potable water supply for the community. These wells were initially designed as a supplementary water supply during summer months when water production is at its peak, most especially during orchard watering operations. However, water conservation measures taken by the Town and Columbia Brewery, combined with water system optimization practices to streamline the peak water requirements from Arrow Creek, have effectively eliminated the requirement for the operation of the Creston groundwater source wells. Both wells are maintained and run weekly to ensure that the Town of Creston has a sustainable water supply in the event of any emergency contingency.

Arrow Creek Water Treatment Plant

3.0 TOWN OF CRESTON WATER DISTRIBUTION SYSTEM

Each of the two wells can independently supply enough water for the Town water supply demand even during peak consumption in the summer months. Chlorine is added to the well discharge to ensure adequate disinfection of any possible contamination as the water is transported through the distribution grid to consumers' homes.

The groundwater wells are connected to the water distribution grid that supplies the Town's potable water. Four closed reservoirs are located at strategic geographical points within Town, ensuring that adequate supply and water pressure are maintained throughout the community.

A booster pumping station located at Schikurski Park ensures that in the event of a low water level in the Crawford Hill Reservoir located at the high point in Town, water supplied from the groundwater wells can be pumped up from the Schikurski reservoir to Crawford Hill.

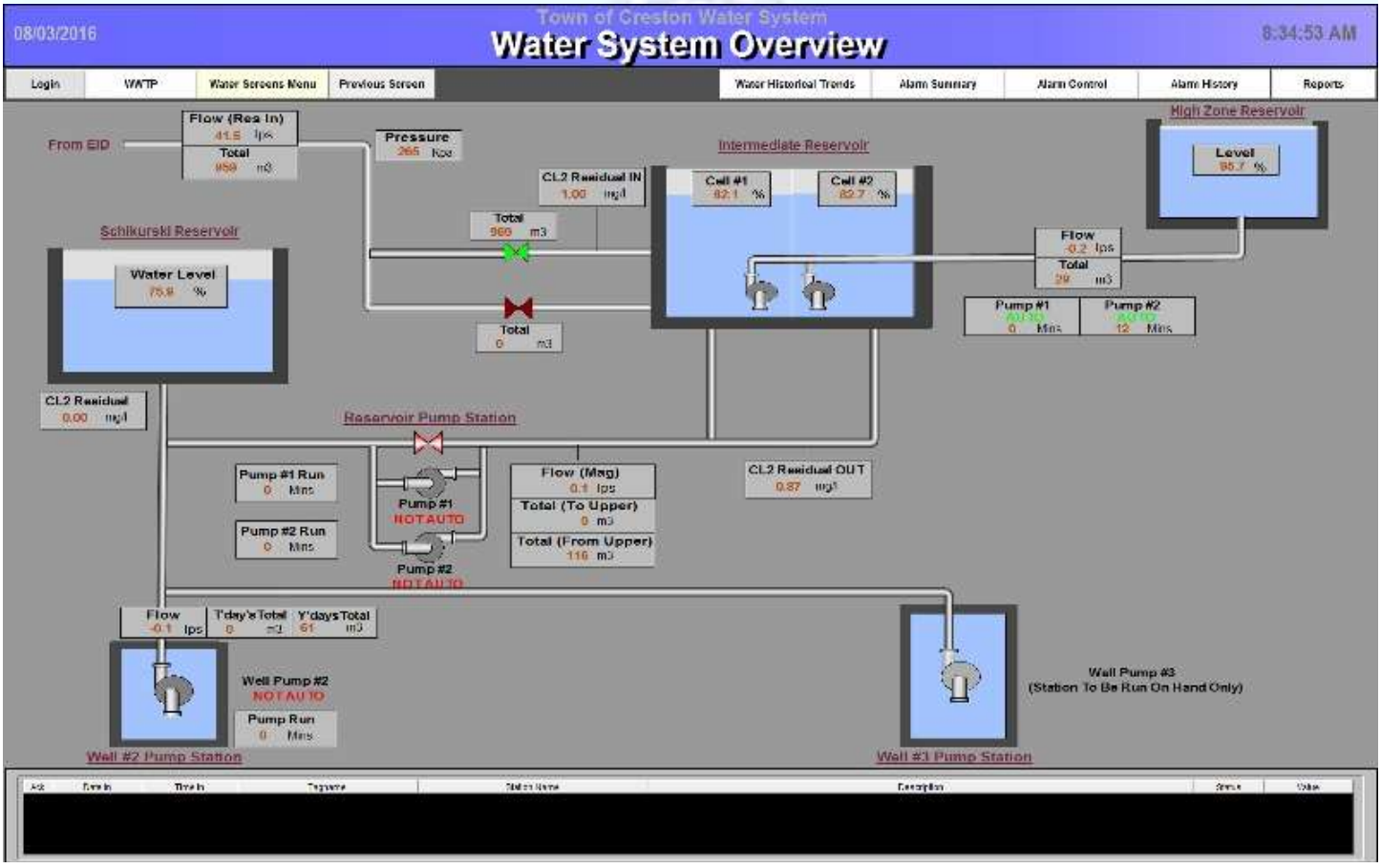
63 kilometers of water main interconnect the Town reservoirs to the community. 3056 residential connections and 239 commercial/industrial connections ensure that the Town population of 5583 (2021 Census) have unrestricted access to the Town water supply.

Schikurski Park Booster Station

4.0 SCADA SYSTEM

Critical elements of the water distribution system are monitored by in-line instrumentation that reports information back to a Supervisory Control and Data Acquisition (SCADA). A SCADA is a computer system that is used for gathering and analyzing real-time data. A SCADA system gathers information from control points, transferring the information back to a central site. It alerts the home station of any potential problems within the system, carrying out necessary analysis, and control and displays the information in a logical and organized fashion.

The Creston Water Supply SCADA monitors flow, water pressure, reservoir levels, chlorine residual, and equipment status among other critical parameters. Should any problem develop, the SCADA analyzes the situation and informs the Operations staff of the fault(s) through telephone communication, so that developing problems can be dealt with by Town staff no matter what time of day.



Creston Water Distribution SCADA

5.0 PROTECTING THE COMMUNITY - CRESTON'S WATER QUALITY CONTROL PROGRAM

Creston's water meets, or is better than, all federal and provincial health-related guidelines. The Town of Creston's water quality from all available potable water sources is tested bi-annually at an independent accredited Laboratory for a full spectrum of basic water chemistry parameters. The full analyses of these results are posted on the Town of Creston website, www.creston.ca, and are detailed in Appendix "B" of this report.

Additionally, the Town conducts bacteriological sampling on a weekly basis for Total Coliform and Escherichia Coli (E.Coli) from various locations throughout the water distribution system. The sampling frequency and number of samples are determined by the community population. The Town of Creston conducts 6 samples on a weekly basis from locations throughout the Town water distribution system that is representative of the entire distribution grid and the individual water sources. Samples are sent to an independent accredited Laboratory for bacteriological analyses for Total and Fecal (E. Coli) Coliforms.

Should there be any indication of coliform presence in the samples, both the Town staff and Interior Health Authority are immediately notified, and procedures are put into effect to protect the community water supply as well as identify a possible source of contamination. Total Coliform testing is a bacterial indicator test for water and sanitary quality of foods. Coliforms can be found in the aquatic environment, in soil and on vegetation, and their presence is used to indicate that other pathogenic organisms of fecal origin may be present.

Of the more than 300 samples sent out for analyses in 2023, there was never a presence of E.Coli reported in the potable water supply.

Protecting our watersheds

The Town of Creston has an obligation to provide safe drinking water to the community. Even though the Town has many water quality control measures in place to ensure an innocuous water supply, the public can also contribute to protection of our water sources by:

- Proper disposal of chemicals;
- Minimizing the use of fertilizers and pesticides;
- Disposal of unused or out-of-date pharmaceuticals at your local pharmacy;
- Using recreation areas responsibly;
- Picking up after your pet; and,
- Using water wisely - conserving where you can.

6.0 WATER CONSERVATION

Since 2006, approximately when the Arrow Creek Water Treatment Facility was commissioned, detailed daily water records and measurements for the Creston community have been tabulated. Additionally, water consumption for the Columbia Brewery, Creston's single largest industrial/commercial point demand has been kept. This data aids the Town in projecting future potable water demands in correlation with expected population growth and water usage trends.

Projected water demands for Creston through year 2030 have been modelled to allow for Capital Project water infrastructure planning, thus ensuring ample storage and delivery volumes of potable water will always be available.

Environmental considerations are undertaken when developing water distribution models for future growth. Creston developed a Water Conservation Plan in 2007. A key feature of this plan was a thorough comparison of the Town of Creston's water use patterns and efficiencies with other communities in BC and major centers around the world. The plan identified positive aspects of the Town's usage, such as finding that Creston is fairly average in per capita water use. There are some areas where water can be conserved, which ultimately would defer potential water supply increases.

In the Town of Creston, where we are surrounded by an abundance of water, it is easy to forget that water is a precious and limited resource. During the summer months, water consumption increases by as much as 50%, and during hot dry spells, water can be used up faster than the Arrow Creek Water Treatment Facility can replenish the demand.

Because of this, the Town of Creston and the RDCK, in collaboration with Columbia Basin Trust, established a water conservation strategy. This program was aimed at reducing basin-wide water consumption by 20% by 2015, over the 2009 baseline. Per capita, water consumption in Creston, in 2023, was down from the 2009 values by 28% after population growth was accounted for.

Water conservation is the practice of permanently reducing domestic water consumption. Domestic water consumption can be divided in to two major categories – inside water use and outdoor water use.

Reductions in outdoor water use have an impact all year round, and help to reduce the Average Daily Demand. An additional benefit is a similar reduction in domestic wastewater flow. The Town of Creston currently implements water conservation measures such as the following:

- Stage 1 water restrictions go into effect automatically between June 1st and September 30th each year.
- Watering in the early morning and late evening to reduce evaporation losses.
- Planting native or drought resistant plant species.
- Maintaining and adjusting underground irrigation systems to eliminate overspray.

Residents can do their part by demonstrating indoor water conservation measures in their own homes by:

- Taking short showers instead of baths.
- Not running water continuously when preparing food, washing dishes by hand, shaving, or brushing teeth.
- Fixing leaky toilets and faucets.
- Using dishwashers and clothes washers only when full.
- Installation of ultra low flow toilets and showerheads. Installation of faucet aerators.

The Town of Creston offers a $50 rebate for every CSA approved ultra low flow toilet that is installed. The Ultra Low Flow Toilet Rebate Application Forms are also available on the Town website (www.creston.ca) > Our Community > Environment > Water Restrictions > Water Conservation Tips and What You Can Do to Help.

Water conservation can benefit a variety of issues and players in the community:

- Environment and Wildlife:
  - Reduces extraction from surface and groundwater sources.
- Operations:
  - Reductions in outdoor water use, typically lawn irrigation, helping to reduce the Maximum Day and Peak Hour Demands during the summer months.
  - Reduced electrical and disinfection costs.
  - Reduced wastewater flows.
- Finances:
  - Potential for minor reduction in system size and lowered costs.
  - Reduced peak demands have the potential of deferring infrastructure costs.

7.0 WATER QUALITY COMPLAINTS - FREQUENTLY ASKED QUESTIONS

Infrequently, the Town of Creston receives water quality complaints, or general questions about the water supply.

What is Fluoride?

Fluorides are chemical compounds, naturally found in air, water, soil, and almost all foods. Fluorides are commonly released into the environment by erosion resulting in natural concentrations in surface and ground waters.

Most Canadians are exposed to fluorides on a daily basis, both through trace amounts found in foods and those that are added to some drinking water supplies to prevent tooth decay.

Although fluoride is not chemically added as part of the water treatment process, fluoride naturally occurs in the Creston potable water sources in concentrations varying throughout the year, between 0.1 and 0.2 mg/L. The Town of Creston analyzes the quality of water in its watersheds and drinking water bi-annually and makes those results public on the Town of Creston website.

What is water hardness?

Water hardness is caused by calcium and magnesium in the ground and surface water. If either of these minerals are present in your drinking water in high concentrations, the water is considered hard. These minerals come from rock such as limestone that dissolves in our river system. The result of hard water is difficulty making lather or suds for washing and a build-up of minerals on taps and other fixtures.

Water containing low concentrations of calcium or magnesium is called soft water. Municipalities with soft drinking water often have higher incidences of water pipe corrosion (low pH). The degree of hardness in drinking water is commonly classified in terms of its concentration of calcium carbonate:

Hardness Rating	Concentration of Calcium Carbonate (mg/L)	Concentration of Calcium Carbonate (grains/imperial gallon)
Soft	0 to <75	0 to <5.2
Medium Hard	75 to <150	5.2 to <10.5
Hard	150 to <300	10.5 to <21
Very Hard	300 and greater	21 and greater

Are there health issues with water hardness?

There are no known health effects associated with calcium and magnesium minerals in drinking water. However, conventional water softening systems (those that use salts) may not be suitable for people on sodium-reduced diets.

We recommend that consumers thoroughly research the various water softener systems available before deciding whether or not to soften their water. Also, water softeners should be connected so that the water you are drinking is not softened.

How hard is Creston's water?

The October 2023, Creston Drinking Water Analysis reporting for the Crawford Hill Reservoir recorded an average Calcium Carbonate measurement of 41.0 mg/L.

Based on that information, consultation with the chart above shows that the Town of Creston water supply has very soft water, so there is no requirement for consumers to install or use water-softening equipment.

Why is Chlorine added to the Water Supply?

One of the most asked questions from consumers is about the level of chlorine in the water and why we put chlorine in the water in the first place.

We like to think our water is perfectly safe to drink. In our minds we imagine our water has been thoroughly sterilized and is 100% pure. What we do not always understand though is that our water is simply disinfected. In other words, a chemical is used to kill most germs.

Any water system that uses surface water, that is water from a lake or river, has to filter it. This filtration, along with other steps in the treatment process, will remove most everything that is harmful to humans. Yet the water still needs to be disinfected at the very end of its treatment. Although the Arrow Creek water treatment plant uses ultra-violet (UV) disinfection to destroy harmful bacteria, the problem with UV disinfection is that it is instantaneous disinfection at the UV source. Ultra Violet does not have any protracted disinfection qualities. That is where chlorine comes in.

Chlorine kills bacteria on contact, but also leaves a residual in the water to keep the water disinfected until it reaches your faucet. Water leaves the Arrow Creek Water Treatment Facility sterile, but it still has to travel through many feet of pipe and reservoirs in order to make it to your home. All the time the water is traveling to you there is a potential for contaminants to be introduced. Thus, the chlorine is still in the water to prevent any germs from making their way into the water system.

Chlorine residuals in Creston are closely monitored on a real time basis, as well as daily chlorine residual testing taken at the Crawford Hill Reservoir, which feeds the Town's water distribution grid.

Incoming chlorine residual from the Arrow Creek water supply is monitored by an in-line analyzer, and re-chlorination is automatically administered if the incoming residual drops below a pre-set set point. As chlorine loses its disinfectant qualities through time and chemical reaction with microorganisms, the level of chlorine residual will change. Dependent on location within the water distribution grid, the chlorine residual will differ. The further from the reservoir, the lower the chlorine residual can be expected.

In order to protect consumers at the furthest distance from the reservoirs, the reservoir chlorine concentration is kept high enough to allow for a minimum free chlorine residual of 0.2 mg/L at the furthest points along the distribution grid. To achieve this, the Crawford Hill Reservoir free chlorine residual is maintained at approximately 0.85 mg/L.

Alternatives to Chlorine

Eliminating water pollution and cleaning up our watersheds are not going to happen overnight, but alternatives to chlorination for water treatment do exist. Several European and Canadian cities now disinfect their water supplies with ozone instead of chlorine. Currently, a handful of U.S. cities do the same, most notably Las Vegas, Nevada and Santa Clara, California.

There are many articles on the internet that explain the necessity for disinfection of potable water supplies and the various options that are available to consumers who prefer to remove chlorine in their water. There are many products on the market that remove chlorine residuals at the tap and are easily installed and reasonably priced.

For those of us who do not have the luxury of ozonized tap water, we do have other options. There are many websites, such as the consumer information website, WaterFilterRankings.com, that compares various water filters on the bases of price and effectiveness. The site reports that filters from Paragon, Aquasana, Kenmore, GE, and Seagul remove most, if not all, of the chlorine, THMs and other potential contaminates in tap water. Prices vary accordingly as to what particular filtration systems can strip from the water, but if all you want is to remove the incoming chlorine residual from your water supply, an activated carbon filter is recommended. Unit pricing can be under $100 for an activated carbon filtration unit, although when researching various filtration units, it is important to take into consideration the availability and replacement cost of filters.

Concerned consumers without the money to spend on home filtration, though, can just rely on good old-fashioned patience. Chlorine and related compounds will make their way out of tap water if the container is simply left uncovered in the refrigerator for 24 hours.

Why is my water a yellow or rusty color?

Water main repairs, construction and other maintenance work in your area can cause some rust and sediment, which normally adhere to the inside of the water main, to break away. Fire hydrant flushing can also cause this inconvenience. The discoloured water is safe to drink, but may cause water to appear dirty. If this condition occurs in your system, allow a cold water tap to run for five to ten minutes to flush your pipes. If the condition persists, contact the Town of Creston at 250-428-2214.

Why does my water have a milky or cloudy appearance?

Air bubbles in the water may cause a milky or cloudy appearance. This is especially true in cold water. These bubbles pose no health risk. Cloudiness appears more often in the winter when the water is cold. If the water is allowed to sit, the air will dissipate and the water will clear.

Additionally, the use of faucet aerators create high levels of dissolved oxygen in the water, and warm or hot water will also create the effect of milky or cloudy water.

My water smells musty at one faucet?

If the musty odor occurs only at one faucet, the odor is related to something at or near the faucet. Try cleaning the drain, this often removes the odors.

Why does my water taste stale?

Drinking water may taste stale if faucets have not been used in a while. Run the water briefly to allow fresh water from the water main in the street into your plumbing. If you have any concerns about the quality of your water, please contact the Town of Creston.

8.0 ROUTINE MAINTENANCE PROGRAM

Distribution System

- Water mains are flushed using a uni-directional flushing program.
- Air relief valves are cleaned.
- Fire hydrants are completely disassembled and inspected on a 2-year rotation.
- Painting and brush out around hydrants is performed as needed.

Wells

- Daily security checks of wells performed.
- Rehabilitation of wells every 5 years.
- Preventative maintenance of control valves, instrumentation and other well-related equipment is performed on a scheduled basis.
- Emergency maintenance is performed as required.
- Bi-annual full spectrum water quality testing performed.
- Weekly bacteriological analyses for Total and Fecal Coliforms conducted.

Reservoirs

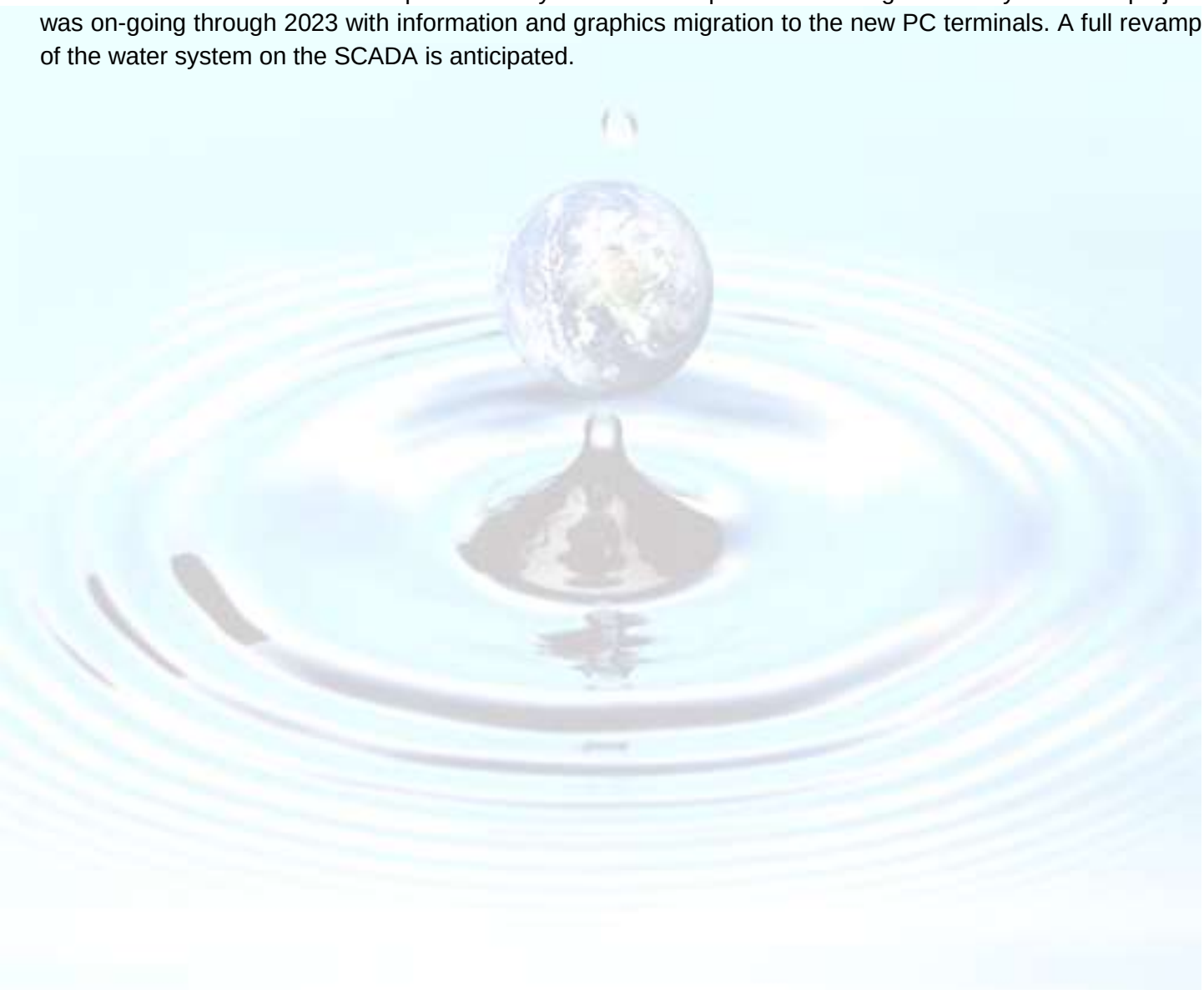
- Daily security check of tanks and compounds.
- Daily checks of pump flows, chlorine and turbidity levels.

Pump Stations

- Daily inspection of all chlorination systems and all pump station equipment.
- Security checks of compounds.
- Preventative maintenance of control valves, instrumentation and other pump station related equipment is performed on a scheduled basis.

9.0 2023 CAPITAL PROJECTS

- Water System Upgrades consisted of the replacement of a 300mm flow meter at the Crawford Reservoir.
- Completion of water main looping (340m) between 2nd Avenue NW and Devon Street to improve water quality and fire flow.
- New software and hardware were purchased by the Town to replace the existing SCADA system. The project was on-going through 2023 with information and graphics migration to the new PC terminals. A full revamp of the water system on the SCADA is anticipated.



APPENDIX "A" - WELL & RESERVOIR LOCATION MAP

CRESTON VALLEY
TOWN of CRESTON

APPENDIX "B" - FULL SPECTRUM ANALYSIS

APPENDICE

mg/L = milligrams per liter (parts per million)
NTU = Nephelometric Turbidity Units, a measure of water clarity
AO = Aesthetic Objective
µg = microgram (one part per billion)
MAC = Maximum Acceptable Concentration
MPN = Most Probable Number
OG = Operational Guideline (treated water)
< = "less than"
≤ = "less than or equal to"

Town of Creston Potable Water Analyses – April 2023

Water Quality Parameter	Result Crawford Hill Reservoir	Result Well #2	Result Well # 3	Reporting Units	Canadian Drinking Water Guidelines
Chloride	**2.75**	**1.59**	**14.8**	mg/L	AO ≤ 250
Fluoride	< 0.10	< 0.10	< 0.10	mg/L	MAC = 1.5
Nitrogen, Nitrate as N	<0.010	**0.208**	**0.946**	mg/L	MAC = 10
Nitrogen, Nitrite as N	< 0.010	<0.010	<0.010	mg/L	MAC = 1
Sulfate	**3.6**	**6.2**	**23.1**	mg/L	AO = 500
Trihalomethanes - Total		<0.00400	<0.00400	mg/L	MAC = 0.1
Carbon, Total Organic	**2.35**	<0.50	<0.50	Mg/L	N/A
Color, True	<5.0	<5.0	<5.0	Color Unit	AO = 15
pH	**6.63**	**6.66**	**7.27**	pH units	AO = 7.0 – 10.5
Turbidity	<0.10	**0.30**	**0.75**	NTU	OG < 1
Alkalinity, Total (as CaCO3)	**28.7**	**53.0**	**155**	mg/L	N/A
Alkalinity, Phenolphthalein (as CaCO3)	<1.0	<1.0	<1.0	mg/L	N/A
Alkalinity, Bicarbonate (as CaCO3)	**28.7**	**53.0**	**155**	mg/L	N/A
Alkalinity, Carbonate (as CaCO3)	<1	<1	<1	mg/L	N/A
Alkalinity, Hydroxide (as CaCO3)	<1	<1	<1	mg/L	N/A
Solids, Total Dissolved	**47**	**73**	219	mg/L	AO = 500
Hardness, Total (Total as CaCO3)	**28.5**	**59.9**	**186**	mg/L	N/A
Aluminum, Total	**0.0083**	<0.0050	<0.0050	mg/L	OG < 0.1
Antimony, Total	<0.0002	<0.0002	<0.0002	mg/L	MAC = 0.006
Arsenic, Total	<0.0005	<0.0005	<0.0005	mg/L	MAC = 0.01
Barium, Total	**0.0126**	**0.0120**	**0.0484**	mg/L	MAC = 2
Beryllium, Total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Bismuth, Total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Boron, Total	<0.0500	<0.0500	<0.0500	mg/L	MAC = 5
Cadmium, Total	<0.00001	<0.00001	**0.000011**	mg/L	MAC = 0.005
Calcium, Total	**7.96**	**14.9**	**42.5**	mg/L	N/A
Chromium, Total	<0.0005	<0.0005	<0.0005	mg/L	MAC = 0.05
Cobalt, Total	<0.00010	<0.00010	<0.00010	mg/L	N/A
Copper, Total	**0.00058**	**0.00088**	**0.00356**	mg/L	MAC = 2
Iron, Total	<0.01	**0.021**	**0.104**	mg/L	AO ≤ 0.3
Lead, Total	<0.0002	<0.0002	<0.0002	mg/L	MAC = 0.005
Lithium, Total	**0.00013**	**0.00034**	**0.00044**	mg/L	N/A

CRESTON VALLEY
TOWN of CRESTON

Water Quality Parameter	Result Crawford Hill Reservoir	Result Well #2	Result Well # 3	Reporting Units	Canadian Drinking Water Guidelines
Magnesium, Total	**2.10**	**5.49**	**19.3**	mg/L	N/A
Manganese, Total	**0.00023**	<0.00020	**0.00199**	mg/L	MAC = 0.12
Molybdenum, Total	**0.00012**	**0.00029**	**0.00054**	mg/L	N/A
Nickel, Total	<0.0004	<0.0004	<0.0004	mg/L	N/A
Phosphorous, Total	<0.05	<0.05	<0.05	mg/L	N/A
Potassium, Total	**0.47**	**0.67**	**1.45**	mg/L	N/A
Selenium, Total	<0.00050	<0.0005	<0.0005	mg/L	MAC = 0.05
Silicon, Total	**4.3**	**4.8**	**5.7**	mg/L	N/A
Silver, Total	<0.00005	<0.00005	<0.00005	mg/L	N/A
Sodium, Total	**3.39**	**4.10**	**16.2**	mg/L	AO ≤ 200
Strontium, Total	**0.0256**	**0.0566**	**0.189**	mg/L	N/A
Sulfur, Total	<3.0	<3.0	**7.6**	mg/L	N/A
Tellurium, Total	<0.0005	<0.0005	<0.0005	mg/L	N/A
Thallium, Total	<0.00002	<0.00002	<0.00002	mg/L	N/A
Thorium, Total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Tin, Total	<0.0002	<0.0002	<0.0002	mg/L	N/A
Titanium, Total	<0.005	<0.005	<0.005	mg/L	N/A
Tungsten, Total	<0.0010	<0.0010	<0.0010	mg/L	N/A
Uranium, Total	**0.000068**	**0.000169**	**0.009107**	mg/L	MAC = 0.02
Vanadium, Total	<0.005	<0.005	<0.005	mg/L	N/A
Zinc, Total	<0.004	<0.004	**0.0061**	mg/L	AO ≤ 5
Zirconium, Total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Bromodichloromethane	<0.001	<0.001	<0.001	mg/L	N/A
Bromoform	<0.001	<0.001	<0.001	mg/L	N/A
Chloroform		<0.001	<0.001	mg/L	N/A
Dibromochloromethane	<0.001	<0.001	<0.001	mg/L	N/A
Surrogate: Toulene-d8		113	114	70-130%	N/A
Surrogate: 4-Bromofluorobenzene		102	104	70-130%	N/A

CRESTON VALLEY
TOWN of CRESTON

Town of Creston Potable Water Analyses – October 2023

Water Quality Parameter	Result Crawford Hill Reservoir	Result Well #2	Result Well # 3	Reporting Units	Canadian Drinking Water Guidelines
Chloride	**1.54**	**2.46**	**16.3**	mg/L	AO ≤ 250
Fluoride	< 0.10	<0.10	<0.10	mg/L	MAC = 1.5
Nitrogen, Nitrate as N	<0.010	**0.285**	**1.01**	mg/L	MAC = 10
Nitrogen, Nitrite as N	< 0.010	< 0.010	<0.010	mg/L	MAC = 1
Sulfate	**5.3**	**6.2**	**22.7**	mg/L	AO = 500
Trihalomethanes - Total	**0.0314**	<0.00400	<0.00400	mg/L	MAC = 0.1
Carbon, Total Organic	**0.65**	<0.50	**0.61**	Mg/L	N/A
Color, True	<5.0	<5.0	<5.0	Color Unit	AO = 15
pH	**6.81**	**6.91**	**7.59**	pH units	AO = 7.0 – 10.5
Turbidity	**0.17**	**0.23**	**0.85**	NTU	OG < 1
Alkalinity, Total (as CaCO3)	**46.4**	**62.8**	**176**	mg/L	N/A
Alkalinity, Phenolphthalein (as CaCO3)	<1.0	<1.0	<1.0	mg/L	N/A
Alkalinity, Bicarbonate (as CaCO3)	**46.0**	**62.8**	**176**	mg/L	N/A
Alkalinity, Carbonate (as CaCO3)	<1	<1	<1	mg/L	N/A
Alkalinity, Hydroxide (as CaCO3)	<1	<1	<1	mg/L	N/A
Solids, Total Dissolved	**45**	**79**	**228**	mg/L	AO = 500
Hardness, Total (Total as CaCO3)	**41.0**	**60.2**	**185**	mg/L	N/A
Aluminum, total	**0.0053**	<0.0050	**0.0093**	mg/L	OG < 0.1
Antimony, total	<0.00020	<0.0002	<0.0002	mg/L	MAC = 0.006
Arsenic, total	<0.0005	<0.0005	<0.0005	mg/L	MAC = 0.01
Barium, total	**0.0211**	**0.0142**	**0.0472**	mg/L	MAC = 2
Beryllium, total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Bismuth, total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Boron, total	<0.0500	<0.0500	<0.0500	mg/L	MAC = 5
Cadmium, total	<0.00001	<0.00001	<0.00001	mg/L	MAC = 0.005
Calcium, total	**11.7**	**15.2**	**343.4**	mg/L	N/A
Chromium, total	<0.00050	<0.00050	<0.0005	mg/L	MAC = 0.05
Cobalt, total	<0.00010	<0.00010	<0.00010	mg/L	N/A
Copper, total	**0.00042**	**0.00073**	**0.00822**	mg/L	MAC = 2
Iron, total	<0.01	<0.01	**0.200**	mg/L	AO ≤ 0.3
Lead, total	<0.0002	<0.0002	**0.00046**	mg/L	MAC = 0.005
Lithium, total	**0.00017**	**0.00033**	**0.00043**	mg/L	N/A
Magnesium, total	**2.89**	**5.41**	**18.5**	mg/L	N/A
Manganese, total	<0.00020	<0.00020	**0.00356**	mg/L	MAC =0.12
Molybdenum, total	**0.00015**	**0.00030**	**0.00051**	mg/L	N/A
Nickel, total	<0.00040	<0.00040	<0.00040	mg/L	N/A
Phosphorous, total	<0.05	<0.05	<0.05	mg/L	N/A
Potassium, total	**0.49**	**0.67**	**1.41**	mg/L	N/A

CRESTON VALLEY
TOWN of CRESTON

Water Quality Parameter	Result Crawford Hill Reservoir	Result Well #2	Result Well # 3	Reporting Units	Canadian Drinking Water Guidelines
Selenium, total	<0.00050	<0.0005	<0.0005	mg/L	MAC = 0.05
Silicon, total	**4.0**	**4.6**	**5.5**	mg/L	N/A
Silver, total	<0.00005	<0.00005	<0.00005	mg/L	N/A
Sodium, total	**2.57**	**4.80**	**16.5**	mg/L	AO ≤ 200
Strontium, total	**0.0349**	**0.0584**	**0.186**	mg/L	N/A
Sulfur, total	<3.0	<3.0	**7.1**	mg/L	N/A
Tellurium, total	<0.0005	<0.0005	<0.0005	mg/L	N/A
Thallium, total	<0.00002	<0.00002	<0.00002	mg/L	N/A
Thorium, total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Tin, total	<0.0002	<0.0002	**0.00028**	mg/L	N/A
Titanium, total	<0.005	<0.005	<0.005	mg/L	N/A
Tungsten, Total	<0.0002	<0.0020	<0.0020	mg/L	N/A
Uranium, total	**0.000091**	**0.000173**	**0.00778**	mg/L	MAC = 0.02
Vanadium, total	<0.0050	<0.0050	<0.0050	mg/L	N/A
Zinc, total	<0.0040	<0.0040	<0.0040	mg/L	AO ≤ 5
Zirconium, total	<0.0001	<0.0001	<0.0001	mg/L	N/A
Bromodichloromethane	<0.001	<0.001	<0.001	mg/L	N/A
Bromoform	<0.001	<0.001	<0.001	mg/L	N/A
Chloroform	**0.0314**	<0.001	<0.001	mg/L	N/A
Dibromochloromethane	<0.001	<0.001	<0.001	mg/L	N/A
Surrogate: Toulene-d8	129	131	114	70-130 %	N/A
Surrogate: 4-Bromofluorobenzene	114	116	104	70-130 %	N/A
Monochloroacetic Acid	<0.0020	<0.0020	<0.0020	mg/L	N/A
Monobromoacetic acid	<0.0020	<0.0020	<0.0020	mg/L	N/A
Dichloroacetic Acid	**0.0103**	**0.0122**	**0.0130**	mg/L	N/A
Trichloroacetic Acid	**0.0153**	**0.0227**	**0.0189**	mg/L	N/A
Dibromoacetic Acid	<0.0020	<0.0020	<0.0020	mg/L	N/A
Total Haloacetic Acids (HAA5)	**0.0255**	**0.0350**	0.0319	mg/L	MAC = 0.08
Surrogate: 2-Bromopropionic Acid	104	107	**108**	70-130 %	

CRESTON VALLEY
TOWN of CRESTON

Microbiological Organisms (<1 means not detected)

Water Quality Parameter	Units	Canadian Drinking Water Guidelines			Major Source
		Crawford Hill Reservoir	Well # 2	Well # 3	
E.Coli	MPN/100 mL	<1	<1	<1	Domestic animals, wildlife and human waste
Total Coliform	/100 mL	<1	<1	<1	Soil, domestic animals and wildlife

* Bacteriological testing for E.Coli and Total Coliforms are conducted weekly from various locations throughout the water distribution system, including the Crawford Hill Reservoir and Wells #2 and #3. All bacteriological samples taken during 2023 were analyzed as negative for both E.Coli and Total Coliform counts.