Fulford Water Service

2024 Annual Report

CRD | Drinking Water

INTRODUCTION

This report provides a summary of the Fulford Water Service for 2024. It includes a description of the service, summary of the water supply, demand, and production, drinking water quality, operations highlights, capital project updates and financial report.

SERVICE DESCRIPTION

The Fulford Water Utility is a semi-rural residential community located on Salt Spring Island. It services the Fulford Elementary School and a small commercial component, including the BC Ferries Terminal. The service was created in 1968 as the Fulford Water Improvement District and became a CRD service in 2004. The Fulford Water Utility (Figure 1) is comprised of 102 parcels of land with 95 single-family equivalents (SFE) as the use on some parcels represents more than one dwelling.

The utility obtains its drinking water from Lake Weston, a small lake that lies within an uncontrolled multi-use watershed outside and northeast of the service area. The Capital Regional District (CRD) holds two licenses to divert a total of up to 291.6 cubic metres per day and store up to 49,339 cubic metres. Lake Weston is estimated to have a total volume of 1,090,000 cubic metres. Lake Weston is subject to seasonal water quality changes and is affected by periodic algae blooms.

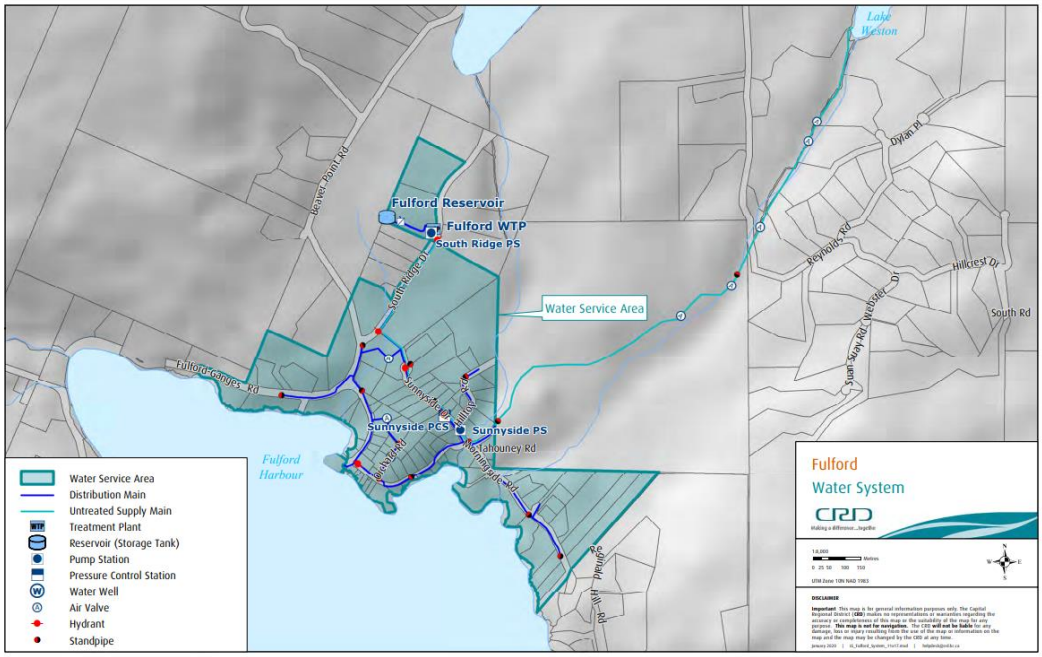

Figure 1: Fulford Water Service

The Fulford water system is primarily comprised of:

- a water treatment plant (WTP) that draws water from Lake Weston and treats it at a location on South Ridge Drive, adjacent to the Fulford Elementary School. The water is treated using

a rapid mix system, flocculation, dissolved air floatation (DAF) and filters, ultraviolet disinfection, then chlorination prior to being pumped, via the distribution system to a reservoir. The water treatment plant (WTP) design flow rate is 4.5 litres/sec (60 Igpm);

- one raw water pump station on Sunnyside Drive near Hilltop Road (flow rate of two pumps running is 2.3 litres/sec (30 Igpm);
- approximately 4,500 m of water distribution pipe;
- 1 water reservoir – 360 m^3 (80,000 Ig);
- fire hydrants, standpipes, and gate valves;
- water service connections complete with water meters to commercial properties only;
- 1 pressure regulating station (PCS) on Sunnyside Drive near Hilltop Road.

WATER PRODUCTION AND DEMAND

Annual water production since 2020 is shown in Figure 2. A total of 24,701 m3 water was extracted from Lake Weston in 2024. This is a 14% decrease from the previous year and an 18% decrease from the 5-year rolling average.

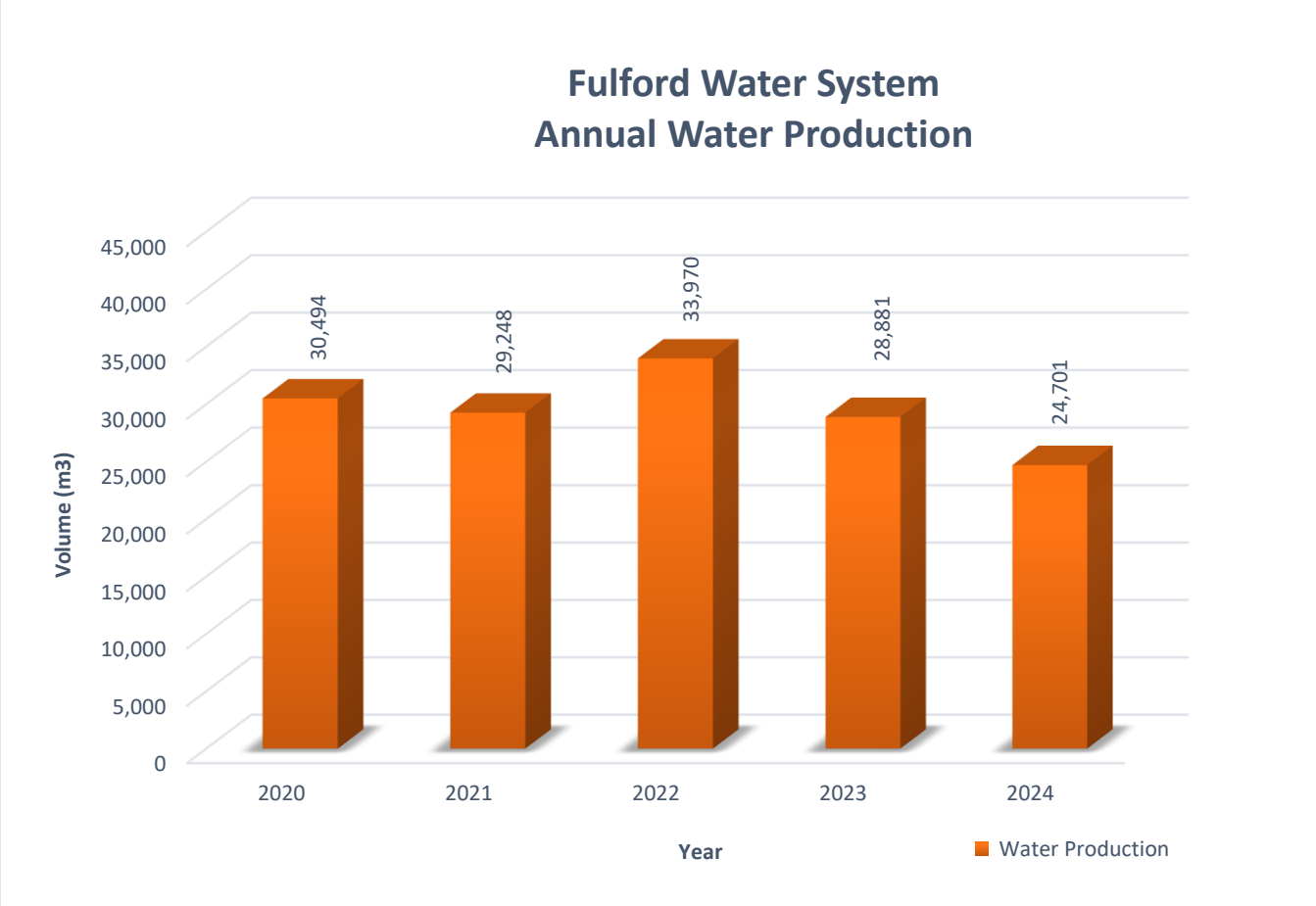

Figure 2: Fulford Water Service Annual Water Production

Water production by month for the past five years is shown in Figure 3. The monthly water production trends are typical for small water systems such as the Fulford water system. Water production from the fall of 2020 and 2022 were higher due to water system leaks that were difficult to locate.

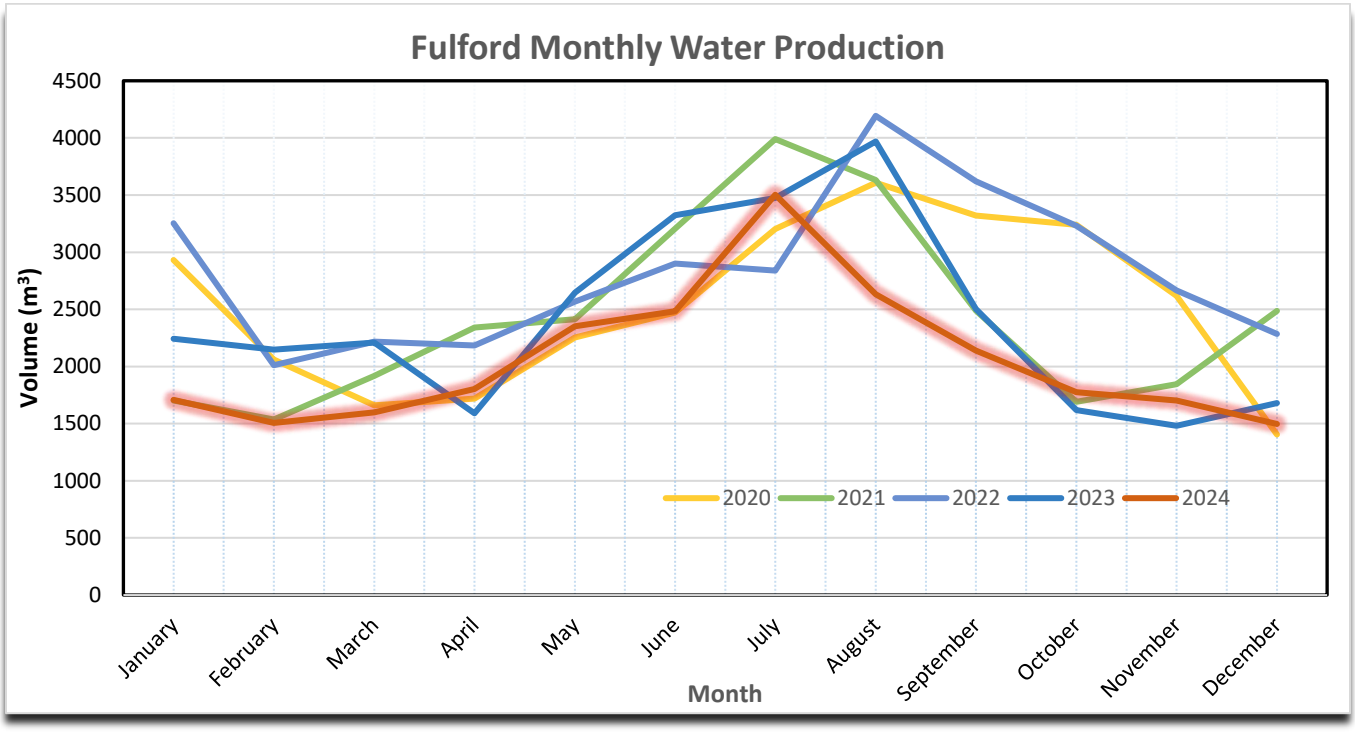

Figure 3: Fulford Water Service Monthly Water Production

The Fulford Water System does not have residential water meters and therefore the average per single-family equivalent (SFE) is simply a calculated value. Utilizing 95 SFE and deducting an allowance of 20% for non-revenue water such as water system leaks, fire hydrant usage and water system maintenance and operational use (water main flushing, filter system backwashing), the average SFE is 208 m3 per year for 2024. This is a 14% decrease from the previous year.

WATER QUALITY

Overall, the Fulford Water System provided good quality drinking water to its customers in 2024. Numerous samples for a variety of water quality parameters were collected and analysed throughout the year. The results confirmed that the DAF and disinfection treatment stages were effective in treating raw water from Lake Weston.

Typical Fulford drinking water quality characteristics for 2024 are summarized as follows:

Raw Water:

Lake Weston exhibited low concentrations of total coliform bacteria (TC) throughout most parts of the year with higher concentrations during the summer months. *E.coli* bacteria were only found in very low concentrations in the summer.

No parasitic cysts (*Giardia*) and no of parasitic oocysts (*Cryptosporidium*) were detected in the raw source water from the lake.

Raw water from the lake was slightly hard (annual median 35.6 mg/L $CaCO_3$).

A total organic carbon (TOC) concentration range from 5.9 to 7.1 mg/L indicates a mesotrophic (semi-productive) lake status. This has been slightly higher than in previous years.

Four metal test results showed low iron and manganese concentrations in the raw water throughout most of the year but elevated concentrations above the aesthetic objective in the Guidelines for Canadian Drinking Water Quality (GCDWQ) during spring. Either of these metals in exceedance of the aesthetic objectives can cause, if untreated, aesthetic issues such as water discolouration. The raw water colour was consistently elevated above the aesthetic objective, which may be a result of tannin and lignin, all natural components found in local lakes.

The raw water turbidity (cloudiness) was generally below 1 NTU except for June when the raw water entering the treatment plant was 3.5 NTU.

CRD staff tested raw water entering the treatment plant for per-and polyfluoroalkyl substances (PFAS) in the fall of 2024. The result was non-detect with a detection limit of 4 ng/L or less.

Treated Water:

Treated water was bacteriologically safe to drink; no indicator bacteria were found in any sample throughout the year.

Treated water turbidity leaving the treatment plant was well below the GCDWQ limit of 1 NTU for the entire year. One sample from the distribution system recorded a turbidity of 6.5 NTU at the end of July. This was likely due to insufficient flushing before sampling.

TOC (median 2.55 mg/L) in the treated water was consistent with historic trends. As TOC is a precursor for disinfection by-products, concentrations consistently much higher than 2 mg/L can lead to exceedances with these substances.

Regulated disinfection by-products such as trihalomethanes (THM) were well below the GCDWQ limits (100 µg/L) with an annual average of 59.5 µg/L. Haloacetic acids (HAA) were not tested in 2024; historic data has shown that HAA concentrations are typically low when THM concentrations are low.

The water temperature was in exceedance of the aesthetic objective of 15ºC from June to October 2024. There is no mitigation for this.

The free chlorine residual concentrations in the distribution system were within the desired range (0.2 – 2.2 mg/L) and indicate a mostly effective secondary disinfection process.

Table 1 and 2 below provide a summary of the 2024 raw and treated water test results.

Water Quality data collected from this drinking water system can be reviewed on the CRD website:

https://www.crd.bc.ca/about/data/drinking-water-quality-reports/

OPERATIONAL HIGHLIGHTS

The following is a summary of the major operational issues that were addressed during the 2024 reporting period:

Water Treatment Plant:

- Remote Terminal Control (RTU) card failed and was replaced
- Chlorine dosing pump failed and was replaced
- Pressure transducer failed and was replaced
- Replaced uninterrupted power supply (UPS) batteries

Fulford Water System:

- Water main break 2881 Fulford Ganges Rd
- Water main break on raw water line between Reynolds Chamber and Sunnyside PS
- Restore Water Service 2914 Fulford Ganges Rd. Planned night work and excavation in the road, significant work in locating service connections and troubleshooting system.
- 268 Morningside Drive service connection leak
- 118 Sunnyside service line leak
- Several power outages throughout the year that contributed to callouts

CAPITAL IMPROVEMENTS

The following is a summary of the major capital improvements, including year-end spending for 2024:

Safe Work Procedures (CE.699.4504): The work scope includes reviewing and developing safe work procedures for operational and maintenance tasks. Ongoing as capital improvements necessitate.

Project	Spending
Budget	$11,000
Project Management	($457)
Contract	($2,292)
Supplies/Materials	($208)
Total Project	**$8,043**

Replacement of AC Water Pipelines – Study and Design (CE.794.6001): Investigation, analysis, criticality assessment and option review to replace the asbestos cement water supply and distribution lines for the Fulford water system.

Project	Spending
Budget	$90,000
Project Management	($22,319)
Contract	($27,367)
Balance Remaining	**$40,314**

Installation of Turbidity Meter on Influent Line (CE.794.1601): Supply and install a turbidity meter on the influent line to improve water quality monitoring and process operation.

Project	Spending
Budget	$28,000
Project Management	($1,757)
Equipment	($23,689)
Balance Remaining	**$2,554**

New Pump Impellors (CE.794.1701): Replacement of impellers of pumps at Sunnyside pump station to match WTP processing capacity.

Project	Spending
Budget	$11,000
Project Management	($234)
Equipment	($0)
Balance Remaining	**$10,766**

Fulford WTP Lifting Apparatus (CE.837.2001): Support for a lifting apparatus is required at ceiling level to lift the 80lb lid for the Saturator and the confined space entry apparatus.

Project	Spending
Budget	$55,000
Project Management	($5,797)
Design	($9,528)
Equipment	($6,258)
Balance Remaining	**$33,417**

2024 FINANCIAL REPORT

Please refer to the attached 2024 Statement of Operations and Reserve Balances.

Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), water sales (Sale-Water), interest on savings (Interest earnings), transfers from the Operating Reserve Fund, and miscellaneous revenue such as late payment charges (Other revenue).

Expenses include all costs of providing the service. General government services include budget preparation, financial management, utility billing, and risk management. CRD Labour and Operating Costs include CRD staff time as well as the costs of equipment, tools, and vehicles. Debt servicing costs are interest and principal payments on long-term debt. Other Expenses include all other costs to administer and operate the water system, including insurance, water testing, and electricity.

The difference between Revenue and Expenses is reported as Net revenue (expenses). Any transfers to or from capital or reserve funds for the service (Transfers to own funds) are deducted from this amount and it is then added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit). In alignment with Local Government Act Section 374 (11), any deficit must be carried forward and included in the next year's financial plan.

WATER SYSTEM PROBLEMS - WHO TO CALL:

To report any event or to leave a message regarding the Fulford water system, call either:

CRD water system *emergency call* centre: **1-855-822-4426 (toll free)**
1-250-474-9630 (toll)
CRD water system *general enquiries* (toll free): **1-800-663-4425**
When phoning with respect to an emergency, please specify to the operator, the service area in which the emergency has occurred.

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Appendix A: 2024 Statement of Operations and Reserve Balances

For questions related to this Annual Report please email saltspring@crd.bc.ca

Table 1: 2024 Summary of Raw Water Test Results, Fulford Water System

PARAMETER		2024 ANALYTICAL RESULTS				CANADIAN GUIDELINES	2014 - 2023 ANALYTICAL RESULTS			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Minimum	Range Maximum	≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum	Range Maximum
ND means Not Detected by analytical method used										
Physical Parameters/Biological										
Colour, True	TCU	**23**	11	19	31	≤ 15 AO	21	103	1.2	34
Hardness as $CaCO_3$	mg/L	**35.6**	4	34.2	36.1	No Guideline Required	34.6	30	28.9	61.3
pH	pH Units	Not tested in 2024				7.0-10.5 AO	7.1	35	6.2	8
Carbon, total organic	mg/L	**6.1**	4	5.9	7.1		5.375	36	3.92	7
Turbidity	NTU	**0.45**	12	0.25	3.5		0.62	128	0.2	4.92
Water Temperature	Degrees C	**10.4**	27	7	17.5		12	513	2.5	20
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	CFU/100 mL	**39.5**	12	< 1	410		26	125	<1	5500
E. coli	CFU/100 mL	**< 1**	12	< 1	1		< 1	128	<1	< 10
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2024					1110	39	90	3960
Parasites						No MAC Established				
Cryptosporidium, Total oocysts	oocysts/100 L	**<1**	2	<1	<1	Zero detection desirable	<1	11	<1	<1
Giardia, Total cysts	cysts/100 L	**<1**	2	<1	<1	Zero detection desirable	<1	11	<1	0.55
Algal Toxins										
Total Microcystins	ug/L	Last analyzed in 2011				1.5 MAC				
Metals										
Aluminum	ug/L as Al	**25.2**	4	7.7	46.2	2900 MAC / 100 OG	22.55	30	5.5	4600
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	30	< 0.5	< 0.5
Arsenic	ug/L as As	**0.27**	4	0.25	0.29	10 MAC	0.245	30	0.2	0.82
Barium	ug/L as Ba	**6.9**	4	6	7.3	100 MAC	6.4	30	5.5	< 9
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	0.12		< 0.1	30	< 0.1	< 3
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	28	< 1	< 1
Boron	ug/L as B	**< 50**	4	< 50	< 50	5000 MAC	< 50	30	< 50	139
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	0.01	7 MAC	< 0.01	30	< 0.01	< 0.1
Calcium	mg/L as Ca	**11.35**	4	11	11.5	No Guideline Required	11.15	30	9.2	17.5
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	30	< 1	< 10
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	30	< 0.2	< 20
Copper	ug/L as Cu	**9.765**	4	9.28	12.9	2000 MAC / ≤ 1000 AO	8.065	30	5.92	55
Iron	ug/L as Fe	**79**	4	48.9	153	≤ 100 AO	81.7	30	12	285
Lead	ug/L as Pb	**0.385**	4	0.32	0.47	5 MAC	0.38	30	<0.2	1.08
Lithium	ug/L as Li	**< 2**	4	< 2	< 2		< 2	18	< 2	< 5
Magnesium	mg/L as Mg	**1.73**	4	1.65	1.79	No Guideline Required	1.655	30	1.44	4.28
Manganese	ug/L as Mn	**7.45**	4	2.4	60.6	120 MAC / ≤ 20 AO	5.65	30	1.1	48.4
Molybdenum	ug/L as Mo	**< 1**	4	< 1	< 1		< 1	30	< 1	< 20
Nickel	ug/L as Ni	**5.6**	4	3.5	15.5		< 1	30	< 1	< 50
Potassium	mg/L as K	**0.685**	4	0.641	0.708		0.5685	30	0.032	0.677
Selenium	ug/L as Se	**< 0.1**	4	< 0.1	< 0.1	50 MAC	< 0.1	29	< 0.1	< 0.5
Silicon	ug/L as Si	**1770**	4	1210	2540		1930	30	2.48	10800
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	30	< 0.02	< 10
Sodium	mg/L as Na	**5.475**	4	5.3	5.56	≤ 200 AO	5.32	30	3.98	9.66
Sulphur	mg/L as S	**< 3**	4	< 3	< 3		< 3	28	< 3	< 3
Strontium	ug/L as Sr	**31.55**	4	30.6	33.4	7000 MAC	31.75	30	26.3	57
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	29	< 5	< 20
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	28	< 0.01	< 0.05
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	30	< 5	< 10
Uranium	ug/L as U	**< 0.1**	4	< 0.1	< 0.1	20 MAC	< 0.1	28	< 0.1	< 0.1
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	30	< 5	< 10
Zinc	ug/L as Zn	**21.95**	4	17.9	32.2	≤ 5000 AO	14.15	30	7.3	297
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	< 0.1		< 0.1	28	< 0.1	< 0.5

Table 2: 2024 Summary of Treated Water Test Results, Fulford Water System										
PARAMETER		**2024 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2014 - 2023 RESULTS**			
Parameter Name	Units of Measure	Annual Median	Samples Analyzed	Range Min.	Range Max.	≤ = Less than or equal to	Median	Samples Analyzed	Range Minimum	Range Maximum
ND means Not Detected by analytical method used										
Physical Parameters										
Carbon, Total Organic	mg/L as C	**2.55**	4	2	2.8		2.3	40	0.23	3.45
Colour, True	TCU	**< 2**	11	< 2	3	≤ 15 AO	< 2	37	0.7	23
Hardness as $CaCO_3$	mg/L	**35.15**	4	33.9	35.9	No Guideline Required	33.3	22	28.8	46.7
pH	pH units	Not tested in 2024				7.0-10.5 AO	6.9	37	6.1	7.34
Turbidity	NTU	**0.1**	15	0.05	6.5	1 MAC and ≤ 5 AO	< 0.14	147	0.05	1.1
Water Temperature	Degress C	**11**	200	5	22		11	2584	0.5	24
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	CFU/100 mL	**< 1**	75	< 1	< 1	0 MAC	< 1	563	0	9
E. coli	CFU/100 mL	**< 1**	75	< 1	< 1	0 MAC	< 1	563	0	< 1
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2024				No Guideline Required	< 10	40	< 10	110
Algal Toxins										
Total Microcystins	ug/L	Last analyzed in 2011				1.5 MAC				
Disinfectants										
Disinfectants										
Chlorine, Free Residual	mg/L as Cl2	**0.59**	206	0.2	2.2	No Guideline Required	0.65	2752	0.07	2.43
Chlorine, Total Residual	mg/L as Cl_2	**1.94**	1	1.94	1.94	No Guideline Required	0.79	2403	0.03	2.24
Disinfection By-Products										
Trihalomethanes (THMs)										
Bromodichloromethane	ug/L	**12.5**	4	12	14		12.8	39	8	24
Bromoform	ug/L	**< 1**	4	< 1	< 1		< 1	39	< 0.1	< 1
Chloroform	ug/L	**45**	4	33	56		52	37	32	130
Chlorodibromomethane	ug/L	**1.85**	4	1.7	2.1		1.65	39	< 0.1	5.46
Total Trihalomethanes	ug/L	**59.5**	4	47	72	100 MAC	66.7	39	41	160
HAA5	ug/L	Not tested in 2024					28.6	9	5.1	44
Metals										
Aluminum	ug/L as Al	**10.7**	4	9.5	12.5	2900 MAC / 100 OG	11.7	23	7.3	228
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	22	< 0.5	< 0.5
Arsenic	ug/L as As	**0.155**	4	0.11	0.17	10 MAC	0.13	22	< 0.1	0.837
Barium	ug/L as Ba	**6.05**	4	5.9	6.9	100 MAC	6.05	22	5.2	< 9
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	< 0.1		< 0.1	22	< 0.1	< 3
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	20	< 1	< 1
Boron	ug/L as B	**< 50**	4	< 50	< 50	5000 MAC	< 50	22	< 50	161
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	< 0.01	7 MAC	< 0.01	22	< 0.01	< 0.1
Calcium	mg/L as Ca	**11.3**	4	10.9	11.5	No Guideline Required	10.7	22	9.2	15.6
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	22	< 1	< 10
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	21	< 0.2	< 20
Copper	ug/L as Cu	**5.485**	4	1.23	30.8	2000 MAC / ≤ 1000 AO	19.1	22	2.99	130
Iron	ug/L as Fe	**< 5**	4	< 5	11.5	≤ 100 AO	< 5	22	< 5	27
Lead	ug/L as Pb	**0.595**	4	0.23	0.67	5 MAC	0.62	22	0.23	2.43
Lithium	ug/L as Li	**< 2**	4	< 2	< 2		< 2	13	< 2	< 2
Magnesium	mg/L as Mg	**1.7**	4	1.62	1.76	No Guideline Required	1.605	22	0.901	1.85
Manganese	ug/L as Mn	**< 1**	4	< 1	< 1	120 MAC / ≤ 20 AO	< 1	22	< 1	< 4
Molybdenum	ug/L as Mo	**< 1**	4	< 1	< 1		< 1	22	< 1	< 20
Nickel	ug/L as Ni	**< 1**	4	< 1	< 1		< 1	22	< 1	< 50
Potassium	mg/L as K	**0.6805**	4	0.642	0.682		0.5655	22	< 0.03	0.651
Selenium	ug/L as Se	**< 0.1**	4	< 0.1	< 0.1	50 MAC	< 0.1	21	< 0.1	< 0.5
Silicon	ug/L as Si	**1665**	4	1120	2370		1780	22	3.17	3390
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	22	< 0.02	< 10
Sodium	mg/L as Na	**8.435**	4	7.46	9.63	≤ 200 AO	7.115	22	6.32	8.11
Sulphur	mg/L as S	**< 3**	4	< 3	< 3		< 3	20	< 3	< 3
Strontium	ug/L as Sr	**31.1**	4	29.7	33.4	7000 MAC	31.3	22	26.2	39
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	21	< 5	< 20
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	20	< 0.01	< 0.01
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	22	< 5	< 10
Uranium	ug/L as U	**< 0.1**	4	< 0.1	< 0.1	20 MAC	< 0.1	20	< 0.1	< 0.1
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	22	< 5	< 10
Zinc	ug/L as Zn	**12.8**	4	8.5	44.6	≤ 5000 AO	26	22	1	186
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	< 0.1		< 0.1	20	< 0.1	< 0.1