Sticks Allison Water System

2024 Annual Report

CRD | Drinking Water

Introduction

This report provides a summary of the Sticks Allison Water Service for 2024 and 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 community of Sticks Allison is a rural residential development located on the north side of Galiano Island in the Southern Gulf Islands Electoral Area which was originally serviced by a private water utility. In 1996 the service converted to the Capital Regional District (CRD). The Sticks Allison water service (Figure 1) is made up of 38 parcels encompassing a total area of approximately 23 hectares. Of the 38 parcels, 37 were customers connected to the water system in 2024.

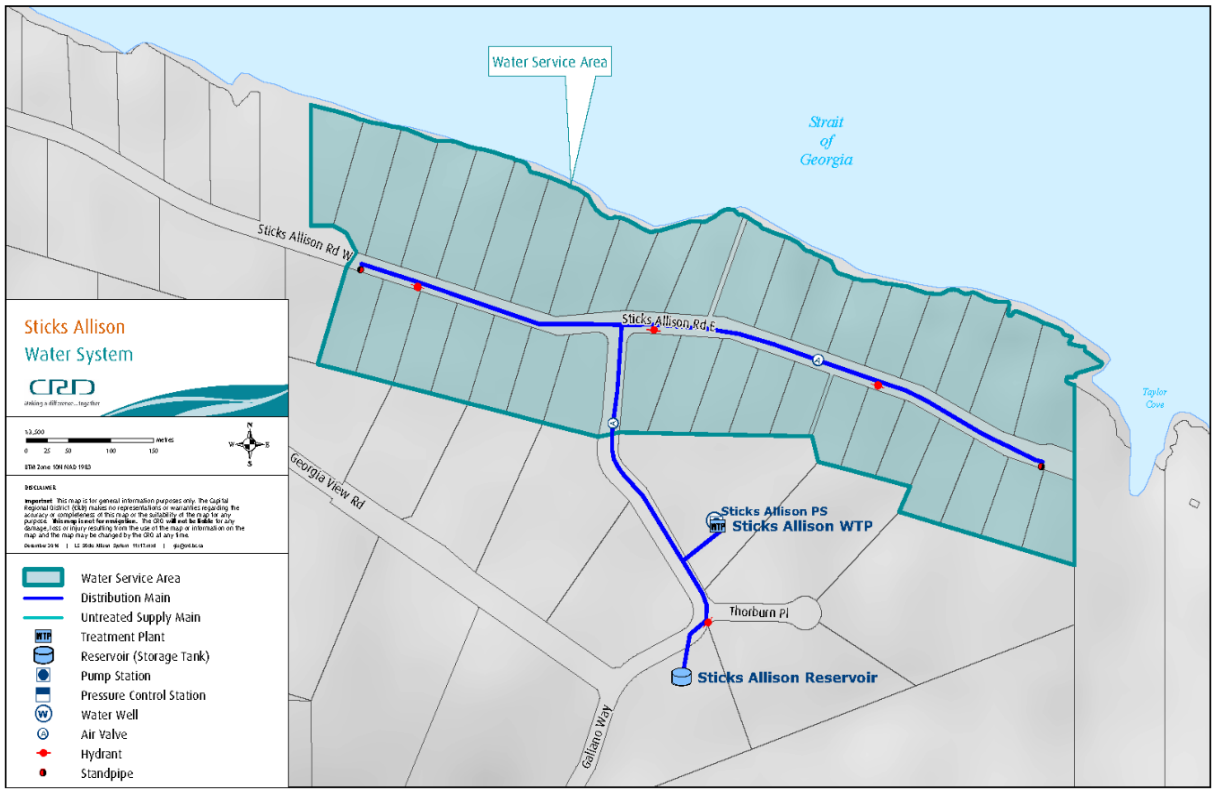

Figure 1: Map of Sticks Allison Water System

The Sticks Allison water system is primarily comprised of:

- One groundwater well, related pumping and control equipment and building.
- Disinfection process equipment (ultraviolet light and chlorine).
- One steel storage tank (total volume is 90 cubic meters).
- Distribution system (approx.1,400 meters of water mains).
- Other water system assets: service connections and meters, five hydrants, two standpipes, 10 gate valves, Supervisory Control and Data Acquisition (SCADA) system and auxiliary generator.

Water Supply

Groundwater supply monthly water levels are highlighted for 2024 in Figure 2. Groundwater levels for the most part during 2024 are within the typical historical range.

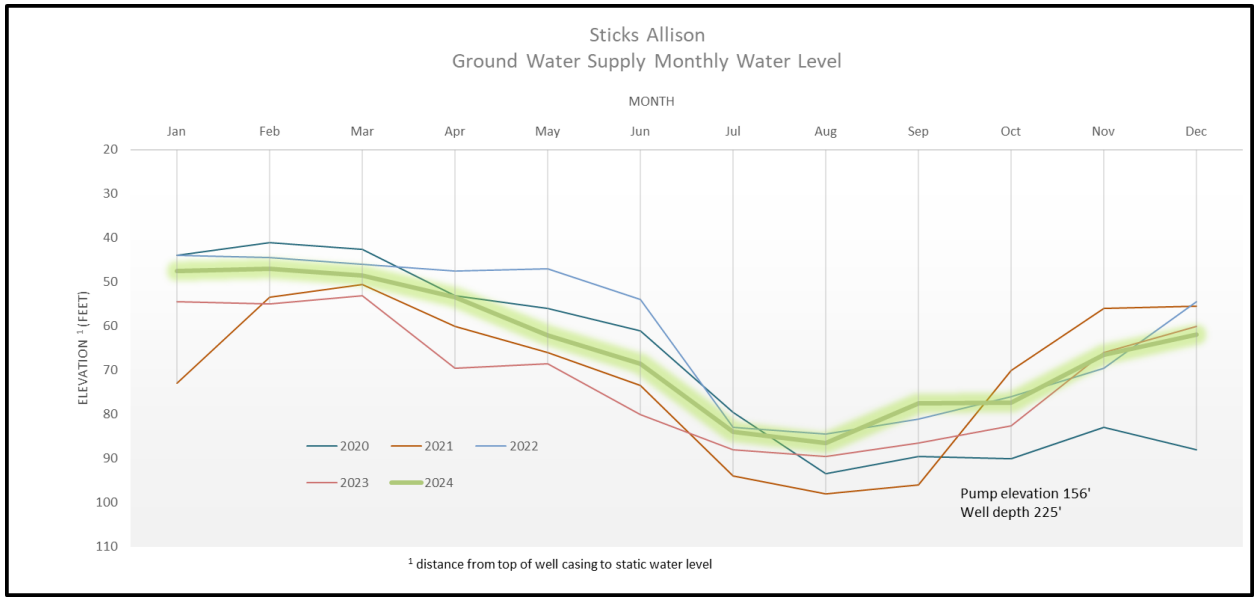

Figure 2: Sticks Allison Monthly Groundwater Water Level

Water Production and Demand

Referring to Figure 3; 5,944, cubic meters of water were extracted (water production) from the ground water source in 2024. This is an 6% decrease from the previous year and a 15% decrease from the five-year average. Water demand (customer water billing) for the service totaled 4,461cubic meters of water; a 9% decrease from the previous year and a 12% decrease from the five-year average.

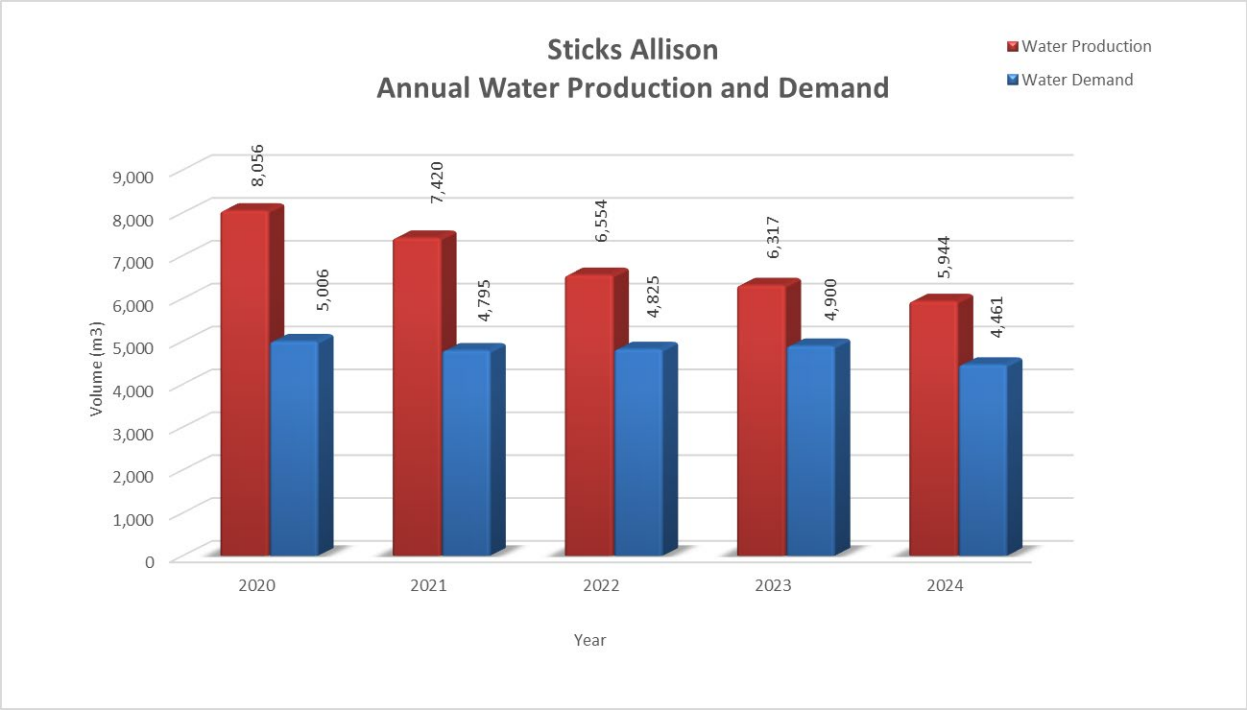

Figure 3: Sticks Allison Water Service Annual Water Production and Demand

The difference between annual water production and annual water demand is referred to as non-revenue water and can include water system leaks, water system maintenance and operational use (e.g. water main flushing, filter system backwashing), potential unauthorized use and fire-fighting use.

The 2024 non-revenue water (1,483 cubic meters) represents approximately 25% of the total water production for the service area. However, approximately 80 cubic meters can be attributed to operational use resulting in a non-revenue water of approximately 24%. Historically, non-revenue water for the service has been about 8%-10%. The higher percentage of non-revenue water for 2024 continues to suggest there is likely ongoing water system leak or leaks that require further investigation.

Figure 4 below illustrates the monthly water production for 2024 along with the historical water production information. The monthly water production trends are typical for small water systems such as the Sticks Allison water system.

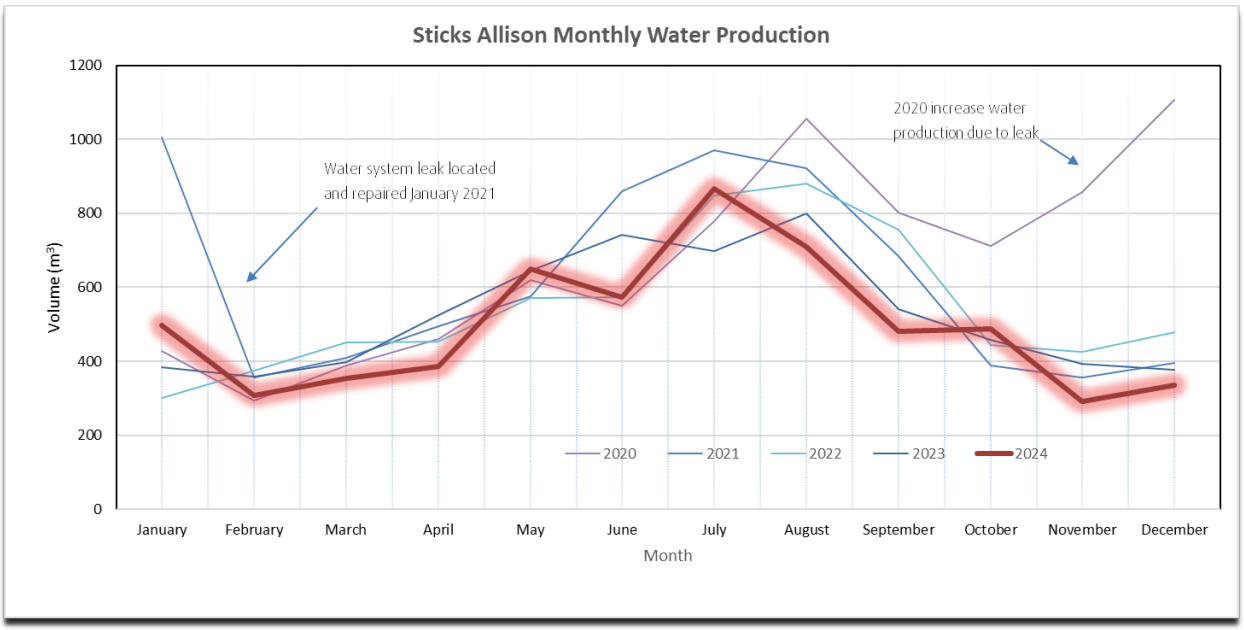

Figure 4: Sticks Allison Water Service Monthly Water Production

Drinking Water Quality

Staff completed the water quality monitoring program at Sticks Allison based on the regulatory requirements and system specific risks. Samples were collected at regular frequencies from the raw water as well as from several sampling stations at the treatment plant and in the distribution system. The samples were shipped for various analyses to the CRD's Water Quality Lab or to external laboratories for special analyses, including disinfection by-products or metals.

The water system performed well in 2024 and consistently supplied safe drinking water to its customers. The groundwater well produced generally good quality source water. It contained medium levels of iron and manganese concentrations. Accumulation effects at the end of the system have occasionally exacerbated these metal concentrations and led to a few exceedances of the aesthetic objectives in the Guidelines for Canadian Drinking Water Quality (GCDWQ). Regular spot flushing efforts usually mitigated this issue. Manganese and or iron exceedances can lead to brown/yellow water discoloration. The well water was free of indicator bacteria in 2024.

The data below provides a summary of the water quality characteristics in 2024:

Raw Water:

- The Sticks Allison well water was free of the indicator bacteria *E.coli* and total coliforms.
- The raw water had a median manganese concentration of 15.2 µg/L which is consistent with previous years. It was also below the aesthetic objectives in the GCDWQ. The median annual iron concentration was 30.6 µg/L and therefore well below the aesthetic objective.
- The raw well water had a median hardness of 34.1 mg/L ($CaCO_3$). pH was not tested in 2024 but is typically between 7.5 and 8.0.
- The raw water turbidity was consistently under 1 Nephelometric Turbidity Unit (NTU) with an annual median of 0.25 NTU.

Treated Water:

- The treated water was safe to drink and free of *E.coli* and total coliform bacteria.
- The treated water turbidity was consistently below 1 NTU with an annual median of 0.45 NTU.
- The iron and manganese concentrations in the distribution system exceeded the aesthetic limits in the GCDWQ at the east end of Sticks Allison Road in May and October. While the manganese concentrations exceeded the aesthetic limit, they never reached the health limit. It is expected that the west end of Sticks Allison Road experienced similar effects, but this was not tested. No customer complaints were received. Regular spot flushes were carried out by the operators.
- The annual average levels of the disinfection by-product total trihalomethanes (TTHM) were well below the maximum allowable concentration. Haloacetic acids (HAA) were not tested in 2024 but are typically low when TTHM are low.
- The free chlorine residual concentrations in the distribution system ranged from 0.03 to 1.17 mg/L with a median of 0.21 mg/L indicating that on occasion the secondary disinfection could be insufficient at the ends of the system. Staff will try to balance the need for proper secondary disinfection and the risk of disinfection by-product formation through higher chlorine levels.

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

- Completed the draining, cleaning and inspection of the water tank. This preventative maintenance activity is tyically performed on a five-year frequency.
- Replaced failed water meter at 362 Sticks Allison Way.
- Emergency response to frozen sodium hypochlorite chemical feed line at the water treatment plant. The event occurred during a cold weather event in January. Corrective work included additional freeze protection of the piping.

Capital Projects Updates

No capital works were planned or completed in 2024. In alignment with the approved capital plan, funds were held for replacement of failed/leaking service lines, which did not end up being utilized.

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), and interest on savings (Interest earnings), a transfer 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 services. CRD Labour and Operating Costs include CRD staff time as well as the costs of equipment, tools, and vehicles. Other Expenses include all other costs to administer and operate the water system, including insurance, supplies, 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 next year's financial plan.

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

Table 1

Table 1: 2024 Summary of Raw Water Test Results, Sticks Allison Water System										
PARAMETER		**2024 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2014-2023 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										
Carbon, Total Organic	mg/L	Not tested in 2024					5.2	1	5.2	5.2
Conductivity @ 25 C	uS/cm	439	4	428	444		391	1	391	391
Hardness as $CaCO_3$	mg/L	**34.05**	4	30.6	38.5	No Guideline Required	31	23	26.6	41.3
pH	pH units	Not tested in 2024				7.0 - 10.5 AO	7.92	11	7.4	8.3
Turbidity	NTU	**0.25**	11	0.15	0.55		0.25	73	0.1	0.95
Water Temperature	°C	Not tested in 2024					10.5	59	9.5	12
Metals										
Aluminum	ug/L as Al	**6.3**	4	3.6	11	2900 MAC / 100 OG	5	23	3.4	24.6
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	23	< 0.5	< 0.5
Arsenic	ug/L as As	**0.495**	4	0.48	0.51	10 MAC	0.53	23	0.45	1.29
Barium	ug/L as Ba	**< 1**	4	< 1	< 1	1000 MAC	< 1	23	< 1	< 9
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	< 0.1		< 0.1	23	< 0.1	< 3
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	22	< 1	< 1
Boron	ug/L as B	**368.5**	4	339	433	5000 MAC	356	23	325	404
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	0.032	7 MAC	< 0.01	23	< 0.01	< 0.1
Calcium	mg/L as Ca	**11.6**	4	10.5	13.2	No Guideline Required	10.5	23	9.04	15.5
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	23	< 1	< 10
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	23	< 0.2	< 20
Copper	ug/L as Cu	**1.185**	4	1.02	10.1	2000 MAC / ≤ 1000 AO	1.53	23	0.65	10.9
Iron	ug/L as Fe	**30.55**	4	18.5	45.9	≤ 100 AO	33.2	23	12.5	395
Lead	ug/L as Pb	**0.205**	4	< 0.2	0.51	5 MAC	0.21	23	< 0.2	0.64
Lithium	ug/L as Li	**12.9**	4	11.2	14.1		12.3	15	11.6	13.9
Magnesium	mg/L as Mg	**1.22**	4	1.08	1.33	No Guideline Required	1.07	23	0.635	1.28
Manganese	ug/L as Mn	**15.2**	4	12.1	19.7	120 MAC / ≤ 20 AO	17.9	23	7.4	84.7
Molybdenum	ug/L as Mo	**3.8**	4	3.5	4.1		4.2	23	3.5	< 20
Nickel	ug/L as Ni	**< 1**	4	< 1	< 1		< 1	23	< 1	< 50
Potassium	mg/L as K	**0.2695**	4	0.258	0.27		0.287	23	0.264	0.587
Selenium	ug/L as Se	**< 0.1**	4	< 0.1	< 0.1	50 MAC	< 0.1	23	< 0.1	< 0.5
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	23	< 0.02	< 10
Sodium	mg/L as Na	**82.5**	4	80.4	85.3	≤ 200 AO	84.4	23	80.7	101
Strontium	ug/L as Sr	**47.15**	4	40.3	51.6	7000 MAC	43.6	23	38	65.1
Sulphur	mg/L as Sc	**9.1**	4	8.7	9.5		9.05	22	7.3	10.9
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	23	< 5	< 20
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	23	< 5	< 10
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	22	< 0.01	< 0.01
Uranium	ug/L as U	**< 0.1**	4	< 0.1	0.12	20 MAC	< 0.1	22	< 0.1	0.22
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	23	< 5	< 10
Zinc	ug/L as Zn	**6.3**	4	< 5	15.1	≤ 5000 AO	8	23	< 5	34.3
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	< 0.1		< 0.1	22	< 0.1	0.16
Non-Metallic Inorganic Chemicals										
Silicon	mg/L as Si	**6525**	4	6390	7790		6640	23	6080	11500
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	CFU/100 mL	**< 1**	12	< 1	< 1		< 1	119	<1	15
E. coli	CFU/100 mL	**< 1**	12	< 1	< 1		< 1	118	<1	2
Hetero. Plate Count, 7 day	CFU/1 mL	Not tested in 2024								
Parasites										
Cryptosporidium, Total oocysts	oocysts/100 L	Not analyzed in 2024				Zero detection desirable	0	1	0	0
Giardia, Total cysts	cysts/100 L	Not analyzed in 2024				Zero detection desirable	0	1	0	0

Table 2

Table 2: 2024 Summary of Treated Water Test Results, Sticks Allison 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										
Carbon, Total Organic	mg/L as C	**2.05**	4	2	2.2		2.555	28	1.08	5.95
Hardness as CaCO3	mg/L	**38.4**	4	34.2	40		33.55	24	29.7	39.9
pH	No Units	**8.05**	4	7.8	8.2		7.89	18	7.6	8.3
Turbidity	NTU	**0.45**	12	0.25	0.95	>1 MAC	0.35	109	0.2	4.8
Water Temperature	°C	**10.95**	132	3.8	16.1	≥15 AO	10.5	2176	0.45	22
Microbial Parameters										
Indicator Bacteria										
Coliform, Total	CFU/100 mL	**< 1**	48	< 1	< 1	0 MAC	< 1	335	<1	64
E. coli	CFU/100 mL	**< 1**	48	< 1	< 1	0 MAC	< 1	335	<1	< 1
Hetero. Plate Count, 7 day	CFU/1 mL	**80**	9	20	4200	No Guideline Required	80	74	< 10	11000
Disinfectants										
Disinfectants										
Chlorine, Free Residual	mg/L as Cl2	**0.205**	132	0.03	1.17		0.36	2192	0	1.88
Chlorine, Total Residual	mg/L as Cl2	**0.23**	8	0.08	0.93		0.39	2195	0	1.98
Disinfection By-Products										
Trihalomethanes (THMs)										
Bromodichloromethane	ug/L	**12.5**	4	2.6	19		147	30	6.4	19.3
Bromoform	ug/L	**< 1**	4	< 1	< 1		< 1	30	< 0.1	1.6
Chloroform	ug/L	**18.5**	4	4.9	29		19	30	7.4	33
Chlorodibromomethane	ug/L	**5.75**	4	1.4	8.5		6.8	30	2.5	13
Total Trihalomethanes	ug/L	**36.5**	4	8.9	56	100 MAC	39.6	29	18	59.3
Haloacetic Acids (HAAs)										
HAA5	ug/L	Not tested in 2022				80 MAC				
Metals										
Aluminum	ug/L as Al	**7.65**	4	7.1	23.3	2900 MAC / 100 OG	15.1	24	5	39.4
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	24	< 0.5	< 0.5
Arsenic	ug/L as As	**0.485**	4	0.46	0.51	10 MAC	0.57	24	0.46	0.89
Barium	ug/L as Ba	**< 1**	4	< 1	2.1	1000 MAC	1.25	24	< 1	2.2
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	< 0.1		< 0.1	24	< 0.1	< 0.1
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	24	< 1	< 1
Boron	ug/L as B	**390**	4	335	410	5000 MAC	367	24	319	416
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	0.035	7 MAC	< 0.01	24	< 0.01	< 0.01
Calcium	mg/L as Ca	**13.9**	4	12.3	14.5	No Guideline Required	11.9	24	10.7	14.4
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	24	< 1	< 1
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	24	< 0.2	< 0.5
Copper	ug/L as Cu	**24.85**	4	12.4	36.6	2000 MAC / ≤ 1000 AO	13.35	24	0.87	49
Iron	ug/L as Fe	**32.05**	4	17.9	190	≤ 100 AO	160.5	24	21.5	EXG 747
Lead	ug/L as Pb	**1.23**	4	0.53	1.62	5 MAC	0.795	24	0.22	2.32
Lithium	ug/L as Li	**12.3**	4	10.7	13.5		12.5	16	11.5	13.3
Magnesium	mg/L as Mg	**0.875**	4	0.833	0.95	No Guideline Required	0.8715	24	0.476	1.3
Manganese	ug/L as Mn	**15**	4	8	110	120 MAC / ≤ 20 AO	51.4	24	6.8	200
Molybdenum	ug/L as Mo	**3.5**	4	2.1	4		3.6	24	1	5.6
Nickel	ug/L as Ni	**< 1**	4	< 1	< 1		< 1	24	< 1	< 1
Potassium	mg/L as K	**0.2795**	4	0.277	0.308		0.2955	24	0.27	0.351
Selenium	ug/L as Se	**< 0.1**	4	< 0.1	< 0.1	50 MAC	< 0.1	24	< 0.1	0.11
Silicon	ug/L as Si	**6780**	4	6350	7580		6965	24	6340	7950
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	24	< 0.02	< 0.02
Sodium	mg/L as Na	**84.35**	4	79.6	85.7	≤ 200 AO	84.25	24	79.6	92
Sulphur	ug/L as S	**8.9**	4	8.4	9.5		8.9	24	6.7	11.6
Strontium	ug/L as Sr	**57.35**	4	47.5	58.6	7000 MAC	52.6	24	46.3	60.3
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	24	< 5	< 5
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	24	< 0.01	< 0.05
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	24	< 5	< 5
Uranium	ug/L as U	**< 0.1**	4	< 0.1	0.11	20 MAC	< 0.1	24	< 0.1	0.16
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	24	< 5	< 5
Zinc	ug/L as Zn	**11.65**	4	8.6	17.9	≤ 5000 AO	14.25	24	5.9	34.1
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	0.14		0.15	24	< 0.1	< 0.5