Port Renfrew Utility System

2023 Annual Report

CRD | Drinking Water, Wastewater, Street Lighting and Refuse

Introduction

This report provides a summary of the Port Renfrew Utility Services for the year 2023 and includes a description of services and a summary of the water, sewer, street lighting, and refuse disposal services in terms of operations, maintenance, capital upgrades, and finances for each service.

Port Renfrew Utility Services Committee

The Port Renfrew Utility Services Committee (PRUSC) has authority delegated by the Capital Regional District (CRD) Board for provision of water, sewer, street lighting and refuse disposal for the Port Renfrew community. Refuse disposal service is also provided to the Pacheedaht First Nation under a service delivery agreement. This Annual Report relates to the services provided under the authority of the PRUSC. Snuggery Cove Water Local Service (Debt Servicing) was created for the sole purpose of servicing debt relating to the expansion of the Port Renfrew water system to the Snuggery Cove area. The debt was paid off and the service budget was discontinued from 2021 onwards.

WATER SERVICE

Service Description

The community of Port Renfrew, located in the Juan de Fuca Electoral Area of the CRD, is comprised of rural residential and commercial and institutional development. The Port Renfrew water service was originally owned by a forestry company and was transferred to the CRD in 1989 to service the Beach Camp area. In 2002, the water service area was extended to include the Snuggery Cove area and again in 2016 to include the lands to the south of Beach Camp. The water service consists of approximately 231 parcels, encompassing a total area of approximately 98.3 hectares. Of the 231 parcels, 315.6 Single Family Equivalents (SFE) were customers to the water system in 2023.

Figure 1: Map of the Water Service Area

The Port Renfrew water system is primarily comprised of:

- One groundwater well, related pumping and control equipment and building.
- Disinfection process equipment (chlorine) and an aeration tower/scrubber for hydrogen sulfide reduction to improve water taste and odour.
- Two steel storage tanks total combined volume is 888 cubic meters (or 235,000 US gallons).
- Distribution system: 4,400 metre network of 150 millimeters (mm) and 100 mm diameter asbestos cement (AC) water mains to the Beach Camp area and a 2,200 metres network of 150 mm and 100 mm polyvinyl chloride (PVC) water mains to the Snuggery Cove area.
- Other water system assets: 195 service connections, 25 hydrants and an auxiliary generator.

Water Supply

2023 data shows that the water level in the winter, when at its highest, was 24 metres above the well pump, and in the summer at its lowest point was 14 metres above the pump.

Water Production and Demand

Referring to Figure 2, 82,006 cubic meters of water was extracted (water production) from the well in 2023; an increase of 14% over the previous year and 25% above the five-year average. The monthly comparison of treated water volumes, produced for the years 2018 to 2023 inclusive, shows that there continues to be a very high demand in August which is typically the peak of drought like conditions and tourism in the area, before trending lower for the rest of the year.

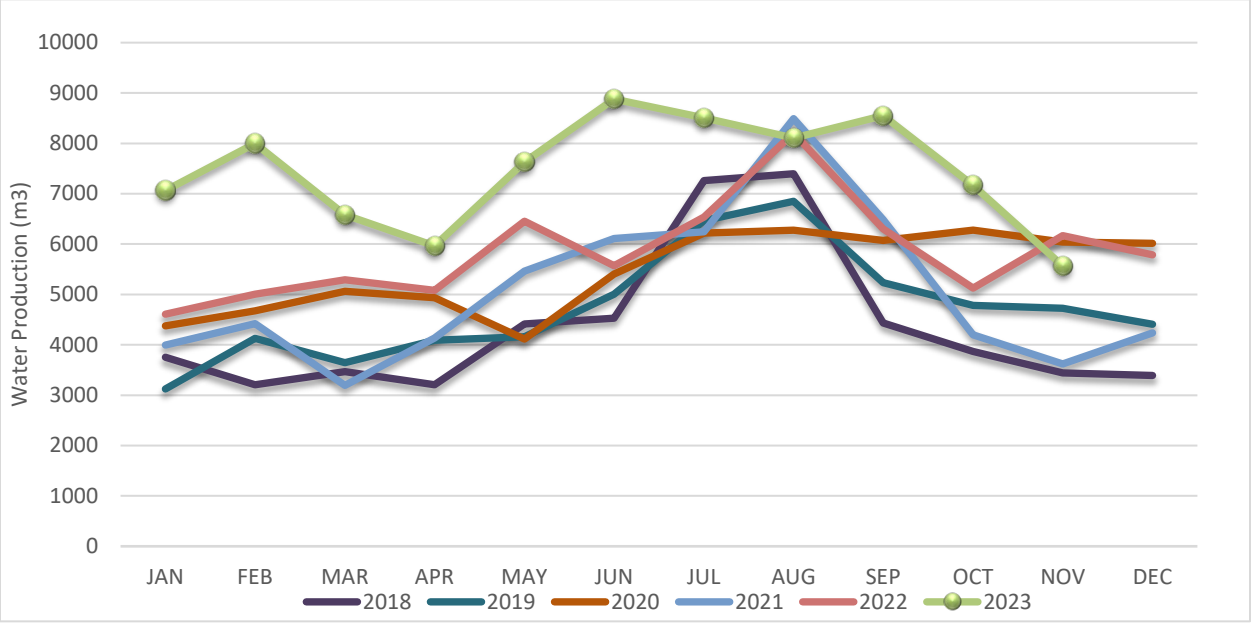

Figure 2: Water Service Monthly Water Production

Drinking Water Quality

The analytical results (biological, chemical, and physical parameters) of water samples collected in 2023 from the Port Renfrew water system indicate that the drinking water was of good quality and within Guidelines for Canadian Drinking Water Quality (GCDWQ) health-related regulatory and aesthetic limits, including disinfection by-products.

While the treated water temperature did exceed the aesthetic limit of 15°C during the summer months (August 8 – September 19), this had no other negative impact on the drinking water quality.

Typical Port Renfrew drinking water quality characteristics for 2023 are summarized as follows:

Raw Water

- The source water from the well was free of *E. coli* and only had one sample with a very low concentration of total coliform bacteria in August.
- The well water was low in iron and manganese concentrations, slightly hard (mean hardness 44.25 mg/L) and had a neutral pH of 7.1.
- The median raw water turbidity was 0.15 Nephelometric Turbidity Units (NTU).
- The source water has consistently high concentrations of hydrogen sulfide, well above the GCDWQ aesthetic objective. This is removed successfully at the well and treatment site.

Treated Water

- The water delivered to the customers was safe to drink throughout the year. No sample out of 84 compliance samples in the distribution system tested positive for *E. coli* or total coliform bacteria in 2023.
- The mean annual free chlorine concentration in the distribution system was an acceptable 0.44 mg/L.
- The average annual disinfection by-product total concentrations for trihalomethanes (TTHM) were well below the GCDWQ limit. Haloacetic acids (HAA) were not tested in 2023. HAA concentrations are typically low when THM concentrations are low.

Table 1 and 2 included as attachments provide a summary of the 2023 raw and treated water test results.

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

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

Water Service Operational Highlights

The following is a summary of the major operational issues that were addressed by CRD Integrated Water Services staff:

- Multiple water leaks were responded to and repaired throughout the system.
- A new chlorine storage shed was erected, and repairs were made to the chlorine injection pumps.
- Annual maintenance was completed on all hydrants, standpipes, and system valves. A failed standpipe was replaced.

Water Service Capital Projects Update

The Capital Projects that were in progress or completed in 2023 include:

- Wickanninish Road AC Watermain Replacement – Construction completed in 2023.

SEWER SERVICE

Service Description

The Port Renfrew sewer system serves 88 properties in the Beach Camp and localized residential area below and has continued to operate reliably in the past year, although the wastewater treatment plant (WWTP) occasionally had difficulty processing peak flow events. The treatment process consists of an extended aeration facility and a steel outfall which discharges treated effluent to the San Juan River estuary under a Ministry of Environment permit. The 88 properties are comprised of 97.77 SFE's.

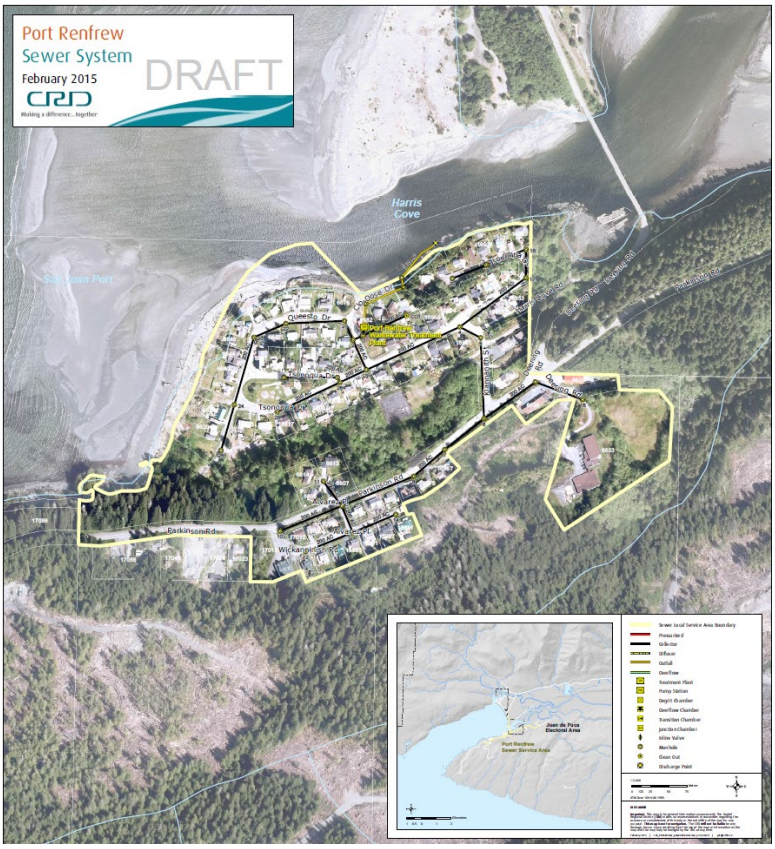

Figure 3: Map of the Sewer Service Area

A sewage volume of 13,622 cubic meters was treated and discharged in 2023 (December data was missing which would have raised the total to approximately 15,000 cubic meters). which equates to an average of 139 cubic meters/SFE. Sewage flows in Port Renfrew went down by 5% from 2023 which can be influenced by annual rainfall and tourist numbers. During the rainy season, inflow and infiltration water enters the sewer system through cracks and defects in the pipes and manholes that were installed in the 1960's.

Figure 4 shows Port Renfrew sewer flow trends over the last 10 years.

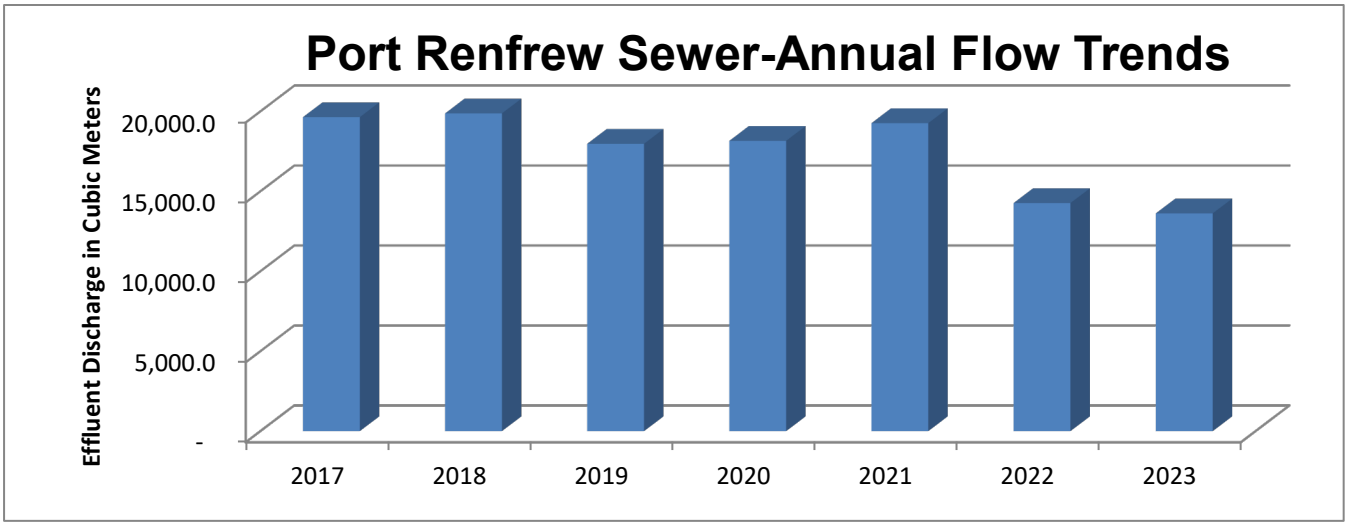

Figure 4: Port Renfrew Sewer Flow Trends

Treated Effluent Discharge Quality

Regulatory Compliance – Wastewater

Flow and effluent quality are assessed for compliance with the provincial discharge permit on a daily and monthly basis, respectively. Mean daily flows in 2023 were similar to flow rates recorded since 2007; flow exceeded the permitted daily maximum one time in December 2023, due to heavy rains. There was one total suspended solids (TSS) exceedance in September of the permitted effluent quality limits, as a result of a blockage in the RAS line.

Receiving Water

Routine receiving water monitoring was last required for the Port Renfrew Wastewater Treatment Plant in 2020 (delayed until 2021) and will be next required in 2024 unless there are planned bypasses, plant failures/overflows, or wet weather overflows that exceed three days duration in the winter or one day duration in the summer. Bypass or overflow sampling is only required once per season for events that are similar in nature as long as the first seasonal sampling confirms results were within guidelines set to protect human primary contact for recreation.

There was no overflow/emergency receiving water sampling conducted in 2023.

Sewer Service Operational Highlights

The following is a summary of the major operational issues that were addressed by CRD Integrated Water Services staff:

- Improvements were made to the surface water drainage around the Plant to prevent water from pooling and creating an electrical hazard; as well as help mitigate localized flooding in the area.
- Annual maintenance was completed on both lift pumps with some minor corrective maintenance performed.
- Improvements to the scum collection system were completed which will have an overall benefit to the entire treatment process.

Sewer Service Capital Projects Update

The Capital Projects that were in progress or completed in 2023 included:

- Generator Upgrade – supply contract was entered into to provide a new standby power generator capable of powering the entire wastewater treatment plant during a power outage. Delivery isn't expected until late 2023.

Street Lighting Service

Street lighting service is provided in the area of Port Renfrew known as Beach Camp. The street lights are operated and maintained by BC Hydro, and costs are recovered through a parcel tax and user charge on parcels in the area where the service is provided. There were no significant issues with this service in 2023.

Refuse Disposal Service

The Port Renfrew Refuse Disposal service serves 379 taxable folios including 330 residential folios within the service area and is funded through direct tax requisition based on the value of each property. The Pacheedaht First Nation also utilizes the service through a fee-for-service agreement. The tonnages of materials received and transferred from the Port Renfrew Garbage and Recycling Depot in 2023 are as follows:

Port Renfrew Garbage & Recycling Depot
(tonnes)

	2023	2022
Garbage	201	237
Recyclables		
- *Scrap metal and large appliances*	66	78
- *Packaging and printed paper*	32	27
- *Tires/electronics*	3	4
Note: Beverage containers, paint, used motor oil and used cooking oil are also accepted at the depot – quantities are not available due to the hauling and processing arrangements in place for these products.		

In 2023 the Service secured $262,500 in grant funding through the Growing Communities Fund to address concerns for the service around collection capacity, transportation, the transition of depot management from caretaker to operator model, Recycle BC's concerns and provide an opportunity to conduct a study for the future of the service. This work is expected to commence in 2024.

Financial Report

Please refer to the attached 2023 Statement of Operations and Reserve Balances for Port Renfrew Water, Sewer, Street Lighting and Refuse Disposal services.

Revenue includes parcel taxes (Transfers from Government), fixed user fees (User Charges), Water Sales, interest on savings (Interest earnings), and miscellaneous revenue such as late payment charges (Other revenue).

Expenses include all costs for providing the services. 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 cost 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 services, for example, insurance, supplies, water testing and electricity etc.

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 added to any surplus or deficit carry forward from the prior year, yielding an Accumulated Surplus (or deficit) that is carried forward to the following year.

Submitted by:	Jason Dales, B.Sc., WD IV, Senior Manager, Wastewater Infrastructure Operations
	Joseph Marr, P.Eng., Senior Manager, Infrastructure Engineering
	Glenn Harris, Ph.D., R.P.Bio., Senior Manager, Environmental Protection
	Russ Smith, Senior Manager, Environmental Resource Management
	Angela Linwood, CPA, CMA, Controller, Financial Services
Concurrence:	Alicia Fraser, P.Eng., General Manager, Integrated Water Services
	Luisa Jones, MBA, General Manager, Parks, Recreation & Environmental Services

Attachments: Table 1
Table 2
2023 Statement of Operations and Reserve Balances

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

Table 1

Table 1: 2023 Summary of Raw Water Test Results, Port Renfrew Water System										
PARAMETER		**2023 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2013 - 2022 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/Non-Metallic Inorganics										
Carbon, Total Organic	mg/L	**0.79**	3	0.62	1.5		1.4	27	0.2	43
Hydrogen Sulfide	mg/L	**0.29**	4	0.21	0.3	<0.05 AO	0.37	5	0.3	0.47
Hardness as CaCO3	mg/L	**44.25**	4	42.1	45.3	No Guideline Required	40.75	28	7.71	47.8
pH	pH units	**7.1**	3	7	7.8	6.5 - 8.5 AO	7.4	48	6.6	8.48
Turbidity	NTU	**0.15**	7	0.1	0.4		< 0.14	42	0.05	< 1.4
Water Temperature	°C	**8.8**	11	8.1	10.2	>15 AO	8.6	111	5	12.1
Microbial Parameters										
Indicator Bacteria and Turbidity										
Coliform, Total	CFU/100 mL	**< 1**	13	< 1	1		< 1	119	<1	2
E. coli	CFU/100 mL	**< 1**	13	< 1	< 1		< 1	119	<1	<1
Metals										
Aluminum	ug/L as Al	**6.4**	4	5.4	7.2	2900 MAC / 100 OG	7	28	5.8	123
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	28	< 0.5	< 0.5
Arsenic	ug/L as As	**0.12**	4	0.12	0.14	10 MAC	0.12	28	< 0.1	< 0.5
Barium	ug/L as Ba	**1.2**	4	1.2	1.3	1000 MAC	1.2	28	< 1	< 9
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	< 0.1		< 0.1	28	< 0.1	< 3
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	26	< 1	< 1
Boron	ug/L as B	**120**	4	111	121	5000 MAC	110.5	28	< 50	943
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	< 0.01	7 MAC	< 0.01	28	< 0.01	0.19
Calcium	mg/L as Ca	**7.925**	4	7.54	8.03	No Guideline Required	7.39	28	2.96	8.73
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	28	< 1	< 10
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	28	< 0.2	< 20
Copper	ug/L as Cu	**< 0.2**	4	< 0.2	0.9	2000 MAC / ≤ 1000 AO	0.225	28	< 0.2	12
Iron	ug/L as Fe	**< 5**	4	< 5	< 5	≤ 300 AO	< 5	28	< 5	80
Lead	ug/L as Pb	**< 0.2**	4	< 0.2	< 0.2	5 MAC	< 0.2	28	< 0.2	< 0.5
Lithium	ug/L as Li	**< 2**	4	< 2	< 2		< 2	12	< 2	< 5
Magnesium	mg/L as Mg	**5.935**	4	5.64	6.14	No Guideline Required	5.545	28	0.081	6.62
Manganese	ug/L as Mn	**9.9**	4	9.8	10	120 MAC / ≤ 20 AO	10	28	< 4	12.1
Molybdenum	ug/L as Mo	**< 1**	4	< 1	1		< 1	28	< 1	< 20
Nickel	ug/L as Ni	**< 1**	4	< 1	1.6		< 1	28	< 1	< 50
Potassium	mg/L as K	**3.425**	4	3.39	3.53		3.365	28	0.199	3.73
Sulphur	mg/L as S	**< 3**	4	< 3	5.8		< 3	26	< 3	4
Selenium	ug/L as Se	**1.24**	4	< 0.1	1.94	50 MAC	0.13	28	< 0.1	3.04
Silicon	mg/L	**4535**	4	4460	5400		4445	28	1400	7120
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	28	< 0.02	< 10
Sodium	mg/L as Na	**29.05**	4	28.6	31.2	≤ 200 AO	27.6	28	23.5	38.2
Strontium	ug/L as Sr	**57.6**	4	57	61.2	7000 MAC	54.25	28	43	82
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	28	< 5	< 20
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	28	< 5	< 10
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	26	< 0.01	< 0.05
Uranium	ug/L as U	**< 0.1**	4	< 0.1	< 0.1	20 MAC	< 0.1	26	< 0.1	< 0.1
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	28	< 5	22
Zinc	ug/L as Zn	**< 5**	4	< 5	9.7	≤ 5000 AO	< 5	28	< 5	136
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	< 0.1		< 0.1	26	< 0.1	< 0.5

Table 2

Table 2: 2023 Summary of Treated Water Test Results, Port Renfrew Water System										
PARAMETER		**2023 ANALYTICAL RESULTS**				**CANADIAN GUIDELINES**	**2013 - 2022 ANALYTICAL RESULTS**			
Parameter	Units of	Annual	Samples	Range				Samples	Range	
Name	Measure	Median	Analyzed	Minimum	Maximum	≤ = Less than or equal to	Median	Analyzed	Minimum	Maximum
ND means Not Detected by analytical method used										
Physical Parameters/Non-Metallic Inorganics										
Carbon, Total Organic	mg/L as C	**0.69**	4	0.57	0.74		0.56	31	< 0.3	15
Hydrogen Sulfide	mg/L	**0.00215**	4	< 0.002	0.0046	<0.05 AO	< 0.002	5	< 0.002	0.0069
Hardness as CaCO3	mg/L	**44.3**	4	42.8	46	No Guideline Required	41.9	25	37.1	48
pH	pH units	**7.2**	3	7.1	7.6	6.5 - 8.5 AO	7.3	38	6.9	8.28
Turbidity	NTU	**0.1**	1	0.1	0.1		0.15	12	< 0.14	0.25
Water Temperature	degrees C	**7.8**	160	4.2	17		10.5	1618	0.7	24.1
Microbial Parameters										
Microbial Parameters										
Coliform, Total	CFU/100 mL	**< 1**	84	< 1	< 1	0 MAC	< 1	526	<1	26
E. coli	CFU/100 mL	**< 1**	84	< 1	< 1	0 MAC	< 1	526	<1	2
Hetero. Plate Count, 7 day	CFU/1 mL	**60**	4	10	450	No Guideline Required	50	13	< 10	390
Disinfectants										
Chlorine, Free Residual	mg/L as Cl2	**0.44**	337	0.06	1.03	No Guideline Required	0.4	1833	< 0.02	15.7
Chlorine, Total Residual	mg/L as Cl2	Not tested in 2023				No Guideline Required	0.54	695	0.05	2.14
Disinfection By-Products										
Trihalomethanes (THMs)										
Bromodichloromethane	ug/L	**9.85**	4	8.7	14		17	29	1.94	26.7
Bromoform	ug/L	**9**	4	6.9	11		8.7	29	< 0.1	20.7
Chloroform	ug/L	**6.45**	4	5.7	8.6		9.1	29	1.84	16.7
Chlorodibromomethane	ug/L	**15.5**	4	13	18		25	29	<0.1	40.3
Total Trihalomethanes	ug/L	**41**	4	35	51	100 MAC	58	29	3.78	98.8
Haloacetic Acids (HAAs)										
HAA5	ug/L	Not tested in 2022				80 MAC	8.4	4	< 5	12
Metals										
Aluminum	ug/L as Al	**6.85**	4	5.9	7	2900 MAC / 100 OG	7.9	25	6	102
Antimony	ug/L as Sb	**< 0.5**	4	< 0.5	< 0.5	6 MAC	< 0.5	25	< 0.5	< 0.5
Arsenic	ug/L as As	**0.14**	4	0.13	0.16	10 MAC	0.14	25	0.11	< 0.5
Barium	ug/L as Ba	**1.35**	4	1.3	1.6	1000 MAC	1.6	25	1	< 9
Beryllium	ug/L as Be	**< 0.1**	4	< 0.1	< 0.1		< 0.1	25	< 0.1	< 3
Bismuth	ug/L as Bi	**< 1**	4	< 1	< 1		< 1	24	< 1	< 1
Boron	ug/L as B	**118.5**	4	113	124	5000 MAC	114	25	100	505
Cadmium	ug/L as Cd	**< 0.01**	4	< 0.01	< 0.01	7 MAC	< 0.01	25	< 0.01	< 0.1
Calcium	mg/L as Ca	**8.04**	4	7.76	8.45	No Guideline Required	7.6	25	6.88	8.81
Chromium	ug/L as Cr	**< 1**	4	< 1	< 1	50 MAC	< 1	25	< 1	< 10
Cobalt	ug/L as Co	**< 0.2**	4	< 0.2	< 0.2		< 0.2	25	< 0.2	< 20
Copper	ug/L as Cu	**1.71**	4	1.14	3.29	2000 MAC / ≤ 1000 AO	2.11	25	0.2	< 8
Iron	ug/L as Fe	**5.3**	4	< 5	9.6	≤ 300 AO	12.6	25	< 5	221
Lead	ug/L as Pb	**< 0.2**	4	< 0.2	< 0.2	5 MAC	< 0.2	25	< 0.2	< 0.5
Lithium	ug/L as Li	**< 2**	4	< 2	< 2		< 2	11	< 2	< 2
Magnesium	mg/L as Mg	**5.825**	4	5.69	6.13	No Guideline Required	5.48	25	4.82	6.33
Manganese	ug/L as Mn	**4.8**	4	4	5	120 MAC / ≤ 20 AO	6.9	25	2.7	EXG 217
Molybdenum	ug/L as Mo	**< 1**	4	< 1	< 1		< 1	25	< 1	< 20
Nickel	ug/L as Ni	**< 1**	4	< 1	< 1		< 1	25	< 1	< 50
Potassium	mg/L as K	**3.46**	4	3.41	3.51		3.33	25	3.1	3.72
Selenium	ug/L as Se	**< 0.1**	4	< 0.1	< 0.1	50 MAC	< 0.1	25	< 0.1	0.821
Sulphur	mg/L as S	**< 3**	4	< 3	< 3		< 3	24	< 3	< 3
Silver	ug/L as Ag	**< 0.02**	4	< 0.02	< 0.02	No Guideline Required	< 0.02	25	< 0.02	< 10
Sodium	mg/L as Na	**32.8**	4	32.5	35.6	≤ 200 AO	30.9	25	24.5	36
Silicon	mg/L	**4545**	4	4440	5420		4440	25	3630	5000
Strontium	ug/L as Sr	**58.55**	4	57.6	61.7	7000 MAC	54.2	25	48.2	67.9
Tin	ug/L as Sn	**< 5**	4	< 5	< 5		< 5	25	< 5	< 20
Thallium	ug/L as Tl	**< 0.01**	4	< 0.01	< 0.01		< 0.01	24	< 0.01	< 0.01
Titanium	ug/L as Ti	**< 5**	4	< 5	< 5		< 5	25	< 5	< 10
Uranium	ug/L as U	**< 0.1**	4	< 0.1	< 0.1	20 MAC	< 0.1	24	< 0.1	< 0.1
Vanadium	ug/L as V	**< 5**	4	< 5	< 5		< 5	25	< 5	10
Zinc	ug/L as Zn	**< 5**	4	< 5	< 5	≤ 5000 AO	< 5	25	< 5	17.2
Zirconium	ug/L as Zr	**< 0.1**	4	< 0.1	< 0.1		< 0.1	24	< 0.1	0.12