

2022 Annual Water Public Report

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2022 APPENDICES

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WATER DISTRIBUTION SYSTEM HISTORY

Since 1992, water purveyors in B.C. have been required to possess an Operating Permit issued by their Regional Health Authority, which includes following the [Guidelines for Canadian Drinking Water Quality](#)), and the [British Columbia Drinking Water Protection Act](#) and [Drinking Water Protection Regulation](#)

WATER DISTRIBUTION SYSTEM DESCRIPTION

The Town of Smithers water system currently draws water from three wells.

Well #1 (19th Avenue) is located about 30 feet away from the original well and is connected to the same pumphouse. It is 268 feet deep and, in a sand and gravel aquifer with a 12-inch telescoping screen between 234 and 265 feet. This pumphouse is used for annual chlorine application for Spring Water Main Flushing.

Well #2 (Victoria Street well) is 244 feet deep, in the same aquifer, well confined from potential contamination from an old landfill site, and with a similar screen from 193 to 235 feet. Its capacity is unknown, but lower than Well #1.

Well #3 (Riverside Park) is located adjacent to the Bulkley River, is 92 feet deep gravel aquifer with a similar screen from 64 to 85 feet. This pumphouse is also used for annual chlorine application for water main flushing.

In 2022, Well #1 (19th Avenue) produced an average of 80.45 L/S (1275 USG/M). Well #2 (Victoria Street) produced at an average rate of 9.2 L/S (808 USG/M). Well #3, (Riverside Park) produced an average of 51 L/S (808 USG/M). Well #1 provides the Town with 45.3% of its water while Well #2 provides 25.7% and Well #3 makes up the remaining 29%.

The Town of Smithers Water System currently has 2411 residential connections and 375 commercial/industrial connections. The system serves a population of approximately 5400 people.

STANDARDS

The Town of Smithers has a Northern Health Authority (NHA) permit to operate a drinking water system with 301 -10000 connections (copy of permit attached – Appendix “A”). The Emergency Response Plan is reviewed and updated annually or as required.

Samples are collected weekly and tested for bacteria. This schedule was setup with the NHA Environmental Health Officer in 2018 to accommodate the limited days that are available to send out the samples weekly. Overall, the Town of Smithers tests at least 8 different locations each month. These samples are taken to the local Northern Health Authority Office and sent to an accredited lab for testing and analyzed for presence of Total Coliform and *E. coli*.

The Town of Smithers Utility Department collected a total of 141 Bacteriological Water Samples in 2022. Of the collected samples, 11 tested positive for trace amounts of Total Coliforms, 0 positive returns for E. coli, and 0 positive returns for Fecal Coliform. There are many factors that can contribute to positive returns in water samples, including handling and sampling practices.

Please note that when background growth counts are **greater than 200**, a follow-up investigation by Northern Health and sampling would be initiated as a higher count could indicate that the water system may be under potability stress. A complete breakdown of Total Coliforms and E. coli results can be found at Healthspace.ca/nha - [Smithers Community Water Systems - Samples](#)

An annual “Core Chemical Analysis” is performed during the summer months. This provides the Town with a full chemical breakdown of the water in the system. These samples are taken at each well and at specific locations elsewhere in town. These samples are analyzed at an accredited lab from the Northern Health Authority for chemical and physical parameters including potability, metals, and mercury. Lab analysis indicated that the water was slightly soft with relatively low mineral content. Results of these samples are included in Appendix “B”.

MANGANESE (MN)

Health Canada has established a new **Health-Based Guideline** in 2019 for manganese with a **Maximum Acceptable Concentration (MAC)** of 0.12 mg/L and an **Aesthetic Objective (AO)** of 0.02 mg/L.

The Town of Smithers samples quarterly for manganese and, because of the new guidelines in place, the water in the system now slightly exceeds the MAC in 14 of 28 samples taken in 2022. Working closely with Northern Health, the Town issued a standing “Water Quality Advisory” in 2022 and is actively working on treatment solutions. More information and FAQs concerning manganese can be found on the Town of Smithers webpage (<https://www.smithers.ca/node/414/manganese-drinking-water>).

Manganese is an essential element for humans and occurs naturally in the environment. Manganese is widely distributed in air, water, and soil. The main problem with manganese in drinking water has to do with undesirable taste and discoloration (black) of the water. Aesthetic Quality Guidelines address parameters, which may affect consumer acceptance of drinking water, such as taste, odour, and color. The Maximum Acceptable Concentration (MAC) for manganese in drinking water is 0.12 mg/L. As with iron, the presence of manganese in water may lead to the accumulation of microbial growths in the distribution system. Even at concentrations below 0.12 mg/L, manganese may form coatings on water distribution pipes that may slough off as black precipitates.

For more information on drinking water, please refer to the Canadian Drinking Water Guidelines (CDWG) - <https://www.canada.ca/en/health->

[canada/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html](https://www2.gov.bc.ca/gov2/services/environmental-workplace-health/water-quality/drinking-water/canadian-drinking-water-guidelines.html)

WATER STORAGE FACILITIES

The distribution system includes two reservoirs, both of which float on the system. The Float on the System is a method of operating a water storage facility. Daily flow into the facility is approximately equal to the average daily demand for water. When consumer demands for water are low, the storage facility will be filling. During periods of high demand, the facility will be emptying. The reservoir levels are lowered and raised significantly each day. One reservoir is 265,000 gallons and is approximately 10 feet deep. The other is 1,000,000 gallons and 25 feet deep. Both have a single inlet/outlet, and the distribution system is flushed annually.

The main Moncton Road reservoir was built in 1975. The reservoir has been tested and the June 2005 Condition Survey is on file in the Utility Supervisor's Office as well as in the Engineering Department at the Town Office.

The small reservoir on Zobnick Road was built in 1950; it contains two compartments and is underground. The Zobnick reservoir was cleaned in September 2015.

WELL MAINTENANCE

Well maintenance is a critical component of our water infrastructure maintenance program. As the water from the three wells is introduced into our distribution grid untreated, we conduct maintenance and monitoring. The water levels are measured and recorded to ensure the aquifer is not over utilized and the system is checked for malfunctions. The system is flushed regularly and all activities around the wells are closely monitored and regulated. The Environmental Operators Certification Program of British Columbia certifies the employees who maintain this facility. Smithers has a Class 1 system, and the Town has three employees who are all level 2 certified that maintain the facilities.

VALVES

The Town of Smithers has 871 flow control valves (including the airport) attached to the underground network. The valves are primarily used to control the direction of water flow and to isolate areas of the network for inspection or repair. The expected service life of a flow control valve is 40 to 50 years without cathodic protection and 100 years with cathodic protection. Cathodic Protection (CP) is a technique used to control the corrosion of metal surface by making it the cathode of an electrochemical cell.

WATER MAIN FLUSHING

The Town of Smithers initiated a water main flushing program in 1978. In 2002, the Town of Smithers replaced the old chlorine gas system used in flushing water mains with a new hypochlorite (liquid chlorine) system. Each main is flushed annually in the month of May during daytime hours and flushes its 49.2 km of water mains. The Hypochlorite is added two weeks before and during flushing.

The Town of Smithers follows the Guidelines for Canadian Drinking Water Quality (GCDWQ) protocols regarding the levels of Chlorine that is used. More information regarding Chlorine can be found at [Guidelines for Canadian Drinking Water Quality: Guideline Technical Document – Chlorine](#).

In addition to accumulated debris, some areas of the water system are susceptible to water stagnation, where water usage is low, or water mains terminate at a cul-de-sac or water main dead ends. Accumulated debris and stagnant water inhibit flow through mains, cause dirty water and create a favourable environment for bacteria growth. In response to these concerns, chlorine is added during flushing to offset any bacteria that might be disturbed during the flushing program.

The Town of Smithers takes the responsibility of a water supplier very seriously and takes pride in the fact that we maintain a system that provides the Town of Smithers with the highest quality of potable water.

SUMMARY OF COMPLETED PROJECTS

In summary, the Town of Smithers undertook the following in the year 2022:

- Flushed every water main
- Installed 3 new services
- Maintained 3 pump stations
- Repaired 6 water main valves
- Repaired 8 water services
- Repaired 4 fire hydrants
- Turned on/off 12 water services
- Conducted 141 microbiological tests and continued a dedicated water sampling and testing program.
 - There were no positive E. coli tests reported.
 - Detected 0 fecal coliform tests
- Installed 7 new water meters with R-900i meters
- Total water pumped in 2022 = 920,031 cubic meters
- Maintained emergency generator by running it once a month for an hour

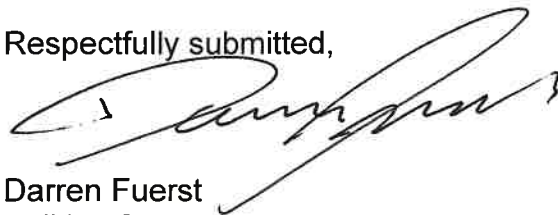
In summer of 2022, the Town replaced the aging 12” water main from Riverside Well to the top of Queen Street. This challenging project involved underground directional drilling and “pulling” the new 8” HDPE pipe down the bank from the top of Queen Street and down under the perimeter trail into Riverside Park.

FUTURE PLANS

In 2023, the Town of Smithers hopes to complete the replacement of the Riverside well pump. This pump is nearing its end of life and will be replaced with a more efficient, modern pump to continue supplying approximately 30% of the Town's water supply more reliably.

The Town Utility Crew are also looking forward to completing the long awaited SCADA System install. The Town has been working with a local engineering firm to install the system which will allow staff to closely monitor and control the operation of the water pumping stations and Reservoirs. This project is expected to be completed by Summer of 2023.

Respectfully submitted,



Darren Fuerst
Utilities Supervisor

DF/jb



2022 Annual Water Public Report

APPENDIX "A"

2022 Ministry of Health Permit

PERMIT TO OPERATE

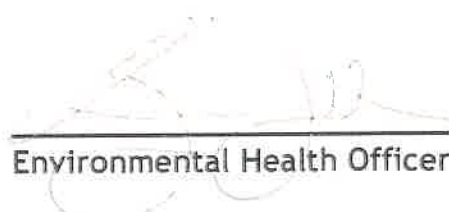
A Drinking Water System with
301-10000 Connections

System Name: Smithers Community Water System
Physical Location: Smithers Community Water System
1027 Aldous Street
Smithers BC
Owner Name: Town of Smithers

Conditions of Permit

- > Bacteriological sampling required minimum of twice weekly, from locations that are representative of the distribution system, as approved by the Environmental Health Officer.
- > Chemical sampling is required minimum yearly, from each source, or at the request of the Environmental Health Officer.
- > An Emergency Response plan shall be maintained and updated annually; or as required.

1-Jul-1992
Effective Permit Date


Environmental Health Officer

30-Jun-2016
Permit Revised Date
*This permit must be displayed
in a conspicuous place and is non-transferable*



northern health
the northern way of caring



2022 Annual Water Public Report

APPENDIX "B"

2022 Analytical Water Report

ANALYTICAL REPORT

Town of Smithers
PO Box 879
Smithers, BC V0J 2N0
dfuerst@smithers.ca

Project: Drinking water
Project Number: -
Project Manager: Darren Fuerst

Work Order: N221079

RECEIVED: 14-Sep-2022

REPORTED: 06-Feb-2023

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Hugh Booth For Jesse Newton
Laboratory Manager

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N221079

LAB #	N221079-01	N221079-02	N221079-03	N221079-04
SAMPLED DATE	13-Sep-22	13-Sep-22	13-Sep-22	13-Sep-22
SAMPLED TIME	13:00	13:25	13:45	14:03
SAMPLE ID	19th Ave Well	Riverside Well	Fire Hall	Town Office
MRL Units	CDWG			

General Parameters (Water)

Parameter	MRL Units	CDWG	N221079-01	N221079-02	N221079-03	N221079-04
pH	1.0 pH units	7.0-10.5	7.6	7.7	7.8	7.8
Alkalinity (total, as CaCO3)	1 mg/L	-	210	110	180	200
Conductivity	1.0 uS/cm	-	434	248	368	413
Colour	1 PtCo units	AO <= 15	4	8	2	7
Turbidity	0.05 NTU	OG < 1	0.35	0.31	0.31	0.28
Solids, Total Dissolved / TDS	1.0 mg/L	AO <= 500	270	160	230	260
Carbon, Total Organic	0.50 mg/L	-	1.48	2.06	1.50	1.07
Ammonia (total as N)	0.03 mg/L	-	0.13	0.17	0.13	0.14
Nitrogen, Total Kjeldahl	0.050 mg/L	-	0.365	0.243	0.290	0.192

Calculated Parameters (Water)

Parameter	MRL Units	CDWG	N221079-01	N221079-02	N221079-03	N221079-04
Nitrate (as N)	0.10 mg/L	MAC = 10	<0.10	<0.10	0.10	<0.10
Nitrogen, organic	0.0500 mg/L	-	0.232	0.0770	0.162	<0.0500
Hardness, Total (as CaCO3)	0.500 mg/L	-	80.4	86.5	70.7	74.5

Anions (Water)

Parameter	MRL Units	CDWG	N221079-01	N221079-02	N221079-03	N221079-04
Chloride	1.0 mg/L	AO <= 250	16.0	4.6	4.2	11.3
Fluoride	0.05 mg/L	MAC = 1.5	0.15	<0.10	0.13	0.14
Nitrite (as N)	0.01 mg/L	MAC = 1	<0.01	<0.01	0.06	<0.01
Nitrate + Nitrite (as N)	0.10 mg/L	MAC = 10	<0.10	<0.10	0.16	<0.10
Sulfate	1.0 mg/L	AO <= 500	2.3	11.2	7.8	4.2

Total Metals (Water)

Parameter	MRL Units	CDWG	N221079-01	N221079-02	N221079-03	N221079-04
Aluminum, total	0.0050 mg/L	OG < 0.1	<0.0050	<0.0050	<0.0050	<0.0050
Antimony, total	0.00020 mg/L	MAC = 0.006	<0.00020	<0.00020	<0.00020	<0.00020
Arsenic, total	0.00050 mg/L	MAC = 0.01	0.00137	0.00307	0.00236	0.00173
Barium, total	0.0050 mg/L	MAC = 1	0.0828	0.0538	0.0730	0.0788
Beryllium, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010
Boron, total	0.0500 mg/L	MAC = 5	<0.0500	<0.0500	<0.0500	<0.0500
Cadmium, total	0.000010 mg/L	MAC = 0.005	<0.000010	<0.000010	<0.000010	<0.000010
Calcium, total	0.20 mg/L	-	21.2	22.5	18.7	19.7
Chromium, total	0.00050 mg/L	MAC = 0.05	<0.00050	<0.00050	<0.00050	<0.00050
Cobalt, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N221079

LAB #		N221079-01	N221079-02	N221079-03	N221079-04	
SAMPLED DATE		13-Sep-22	13-Sep-22	13-Sep-22	13-Sep-22	
SAMPLED TIME		13:00	13:25	13:45	14:03	
SAMPLE ID		19th Ave Well	Riverside Well	Fire Hall	Town Office	
	MRL Units	CDWG				
Total Metals (continued)						
Copper, total	0.00040 mg/L	AO = 1 MAC = 2	0.00075	0.00254	0.0100	0.0139
Iron, total	0.010 mg/L	AO <= 0.3	<0.010	0.022	0.012	<0.010
Lead, total	0.00020 mg/L	MAC = 0.005	<0.00020	<0.00020	<0.00020	<0.00020
Lithium, total	0.00010 mg/L	-	0.00263	0.00053	0.00242	0.00267
Magnesium, total	0.010 mg/L	-	6.64	7.35	5.84	6.16
Manganese, total	0.00020 mg/L	AO <= 0.02 MAC = 0.12	0.137	0.158	0.120	0.119
Mercury, total	0.000010 mg/L	MAC = 0.001	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum, total	0.00010 mg/L	-	0.00353	0.00108	0.00333	0.00355
Nickel, total	0.00040 mg/L	-	<0.00040	<0.00040	<0.00040	<0.00040
Phosphorus, total	0.050 mg/L	-	<0.050	<0.050	0.051	<0.050
Potassium, total	0.10 mg/L	-	1.35	0.57	1.01	1.23
Selenium, total	0.00050 mg/L	MAC = 0.05	<0.00050	<0.00050	<0.00050	<0.00050
Silicon, total	1.0 mg/L	-	6.3	5.1	6.1	6.3
Silver, total	0.000050 mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050
Sodium, total	0.10 mg/L	AO <= 200	61.1	13.6	50.4	58.4
Strontium, total	0.0010 mg/L	MAC = 7	0.270	0.237	0.239	0.254
Sulfur, total	3.0 mg/L	-	<3.0	<3.0	<3.0	<3.0
Tellurium, total	0.00050 mg/L	-	<0.00050	<0.00050	<0.00050	<0.00050
Thallium, total	0.000020 mg/L	-	<0.000020	<0.000020	<0.000020	<0.000020
Thorium, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010
Tin, total	0.00020 mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020
Titanium, total	0.0050 mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050
Tungsten, total	0.0002 mg/L	-	<0.0002	<0.0002	<0.0002	<0.0002
Uranium, total	0.000020 mg/L	MAC = 0.02	0.000599	0.000074	0.000454	0.000538
Vanadium, total	0.0050 mg/L	-	<0.0050	<0.0050	<0.0050	<0.0050
Zinc, total	0.0040 mg/L	AO <= 5	<0.0040	<0.0040	<0.0040	<0.0040
Zirconium, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N221079

LAB #	N221079-05	-	-	-
SAMPLED DATE	13-Sep-22	-	-	-
SAMPLED TIME	12:45	-	-	-
SAMPLE ID	Works Yard	-	-	-

	MRL	Units	CDWG	
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General Parameters (Water)

pH	1.0	pH units	7.0-10.5	8.0
Alkalinity (total, as CaCO3)	1	mg/L	-	210
Conductivity	1.0	uS/cm	-	431
Colour	1	PCu units	AO <= 15	3
Turbidity	0.05	NTU	OG < 1	0.25
Solids, Total Dissolved / TDS	1.0	mg/L	AO <= 500	270
Carbon, Total Organic	0.50	mg/L	-	0.77
Ammonia (total as N)	0.03	mg/L	-	0.14
Nitrogen, Total Kjeldahl	0.050	mg/L	-	0.293

Calculated Parameters (Water)

Nitrate (as N)	0.10	mg/L	MAC = 10	<0.10
Nitrogen, organic	0.0500	mg/L	-	0.154
Hardness, Total (as CaCO3)	0.500	mg/L	-	80.5

Anions (Water)

Chloride	1.0	mg/L	AO <= 250	14.7
Fluoride	0.05	mg/L	MAC = 1.5	0.14
Nitrite (as N)	0.01	mg/L	MAC = 1	<0.01
Nitrate + Nitrite (as N)	0.10	mg/L	MAC = 10	<0.10
Sulfate	1.0	mg/L	AO <= 500	2.7

Total Metals (Water)

Aluminum, total	0.0050	mg/L	OG < 0.1	<0.0050
Antimony, total	0.00020	mg/L	MAC = 0.006	<0.00020
Arsenic, total	0.00050	mg/L	MAC = 0.01	0.00147
Barium, total	0.0050	mg/L	MAC = 1	0.0926
Beryllium, total	0.00010	mg/L	-	<0.00010
Bismuth, total	0.00010	mg/L	-	<0.00010
Boron, total	0.0500	mg/L	MAC = 5	<0.0500
Cadmium, total	0.000010	mg/L	MAC = 0.005	<0.000010
Calcium, total	0.20	mg/L	-	21.2
Chromium, total	0.00050	mg/L	MAC = 0.05	<0.00050
Cobalt, total	0.00010	mg/L	-	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N221079




LAB #	N221079-05	-	-	-
SAMPLED DATE	13-Sep-22	-	-	-
SAMPLED TIME	12:45	-	-	-
SAMPLE ID	Works Yard	-	-	-

	MRL Units	CDWG	
Total Metals (continued)			
Copper, total	0.00040 mg/L	AO = 1 MAC = 2	0.00551
Iron, total	0.010 mg/L	AO <= 0.3	<0.010
Lead, total	0.00020 mg/L	MAC = 0.005	<0.00020
Lithium, total	0.00010 mg/L	-	0.00277
Magnesium, total	0.010 mg/L	-	6.65
Manganese, total	0.00020 mg/L	AO <= 0.02 MAC = 0.12	0.132
Mercury, total	0.000010 mg/L	MAC = 0.001	<0.000010
Molybdenum, total	0.00010 mg/L	-	0.00360
Nickel, total	0.00040 mg/L	-	<0.00040
Phosphorus, total	0.050 mg/L	-	<0.050
Potassium, total	0.10 mg/L	-	1.36
Selenium, total	0.00050 mg/L	MAC = 0.05	<0.00050
Silicon, total	1.0 mg/L	-	6.5
Silver, total	0.000050 mg/L	-	<0.000050
Sodium, total	0.10 mg/L	AO <= 200	60.7
Strontium, total	0.0010 mg/L	MAC = 7	0.271
Sulfur, total	3.0 mg/L	-	<3.0
Tellurium, total	0.00050 mg/L	-	<0.00050
Thallium, total	0.000020 mg/L	-	<0.000020
Thorium, total	0.00010 mg/L	-	<0.00010
Tin, total	0.00020 mg/L	-	<0.00020
Titanium, total	0.0050 mg/L	-	<0.0050
Tungsten, total	0.0002 mg/L	-	<0.0002
Uranium, total	0.000020 mg/L	MAC = 0.02	0.000603
Vanadium, total	0.0050 mg/L	-	<0.0050
Zinc, total	0.0040 mg/L	AO <= 5	0.0056
Zirconium, total	0.00010 mg/L	-	<0.00010

Town of Smithers - Drinking water

Work Order: N221079

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PCo units	Platinum Colbait colour units
uS/cm	Micro Siemens per centimeter
	Maximum Acceptable Concentration. Values above MAC are formatted with red text and solid outline.
	Aesthetic Objective (not health related). Values above AO are formatted with a dashed outline.
	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2019) https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf
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