

2018 Annual Water Public Report

TABLE OF CONTENTS

Water Distribution System History	2
Water Distribution Description.....	2
Standards.....	2
Manganese	3
Water Storage Facilities.....	3
Well Maintenance	4
Valve Maintenance.....	4
Water Main Flushing	4
Completed Projects.....	5
Future Plans.....	5

APPENDICES

Ministry of Health Permit
Bacteriological Test Results

Appendix "A"
Appendix "B" 2018

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.

The Town reported that the Well #1 (19th Avenue) currently produces about 70 L/s (1,100 USGPM), the Well #2 (Victoria Street) produces about 17 L/s (270 USGPM) and the Well #3 (Riverside Park) produces about 60 L/s (950 USGPM). The system serves approximately 5,400 people.

Standards

The Town of Smithers has a Northern Health Authority 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.

Three samples are collected weekly and tested for Bacteria. Overall the Town of Smithers tests at least 9 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*.

In 2018 there were a total of 157 samples collected, and of the samples collected, 5 were positive for Total Coliforms and 0 contained *E. coli*.

A complete breakdown of Total Coliforms and *E. coli* results can be found in Appendix ‘B’.

Chemical testing is done at each well annually and are sent to an accredited lab from Northern Health Authority for testing and are analyzed for chemical and physical

parameters including potability, metals and mercury. A history of results can be found in Appendix C.

The results can also be found at Healthspace.ca/nha - [Smithers Community Water Systems - Samples](#)

Lab analysis indicated that the water was slightly soft with relatively low mineral content. It met objectives except that the manganese level was 0.0958 mg/L, which is slightly above the aesthetic objective (AO) of 0.05 mg/L.

Other than a high Manganese (Mn) count, which is an Aesthetic Objective, there were no other exceedances identified during testing. The Town of Smithers water quality meets or exceeds Guidelines for Canadian Drinking Water Quality.

Manganese (Mn)

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. Operational guidelines are set for parameters that may affect processes at a treatment plant or in the drinking water distribution system. The aesthetic objective for manganese in drinking water is 0.05 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 0.05 mg/L, manganese may form coatings on water distribution pipes that may slough off as black precipitates.

Manganese levels for Well # 1 (19th Avenue) 0.141 mg/L, and Well #2 (Victoria Street) 0.0958 mg/L and Well #3 (Riverside) 0.159 mg/L.

For more information regarding drinking water, please refer to Health Canada and the Canadian Drinking Water Guidelines (CDWG) [Canadian Drinking Water Guidelines - Manganese](#).

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 Condition Survey is on file in the Chief Operator's Office as well as in the

Engineering Department at the Town Office. This reservoir was cleaned in 2005 and is scheduled for cleaning in 2019.

The small reservoir on Zobnick Road was built in 1950; it contains two compartments and is underground. Access is by manhole. 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.

Valve Exercising

Valves are interspersed along water mains and can be shut or opened to alter the flow of water. The Town of Smithers staff began a valve-exercising program in 2003. The Town of Smithers crew inspects each valve annually, exposing buried valves, making repairs and exercising every valve by turning it first to a closed position then back to open. This process begins in June and lasts approximately two weeks. When the water main flushing program is completed in May, the valves are checked to ensure all valves are open to give us adequate water supply and fire protection.

The Town of Smithers has 588 flow control valves 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 with a new hypochlorite (liquid chlorine) system. Each main is flushed annually in the month of May during daytime hours and flushes its 46.7 km of water mains. Chlorine is added the week 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 dead-end water main. 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.

COMPLETED PROJECTS

In 2018 the Town of Smithers replaced 60 meters of cast iron line between 14th and 15th Avenue.

FUTURE PLANS

The Town of Smithers to replace cast iron line between Queen Street and Columbia Drive on the 3900 block of Highway 16 and also 60 meters of cast iron pipe between Princess Street and Hillside Drive.

Respectfully submitted,

Dale Chartrand
Chief Utilities Operator

DC/jb



2018 Annual Water Public Report

APPENDIX "A"

2018 Ministry of Health Permit



northern health

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

- a) Bacteriological sampling required minimum 6 samples monthly, from locations that are representative of the distribution system, as approved by the Environmental Health Officer.
- b) Turbidity shall be maintained at a maximum level of 1 NTU in accordance with the Guidelines for Canadian Drinking Water Quality.
- c) Chemical sampling is required yearly or at the request of the Environmental Health Officer.
- d) An up-to-date Emergency Response plan shall be maintained.

1-Jul-1992
Effective Permit Date

Environmental Health Officer

21-Feb-2011
Permit Revised Date

*This permit must be displayed
in a conspicuous place and is non-transferable*





2018 Annual Water Public Report

APPENDIX "B"

2018 Bacteriological Test Results

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

Project: Drinking water
Project Number: -
Project Manager: Dale Chartrand

Work Order: N808190

RECEIVED: 29-Aug-18

REPORTED: 13-Sep-18

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.



Jesse Newton
Laboratory Manager

Town of Smithers - Drinking water

Work Order: N808190

LAB #	N808190-01	N808190-02	N808190-03	N808190-04
SAMPLED DATE	28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18
SAMPLED TIME	13:20	13:07	12:47	10:45
SAMPLE ID	19th Ave Well	Victoria St Well	Riverside Well	Airport Before Treatment
MRL Units	CDWG			

Bacteriological Parameters (Water)

Total Coliforms	1 CFU/100 mL	MAC = None Detected (<1)	<1	<1	<1	<1
E. coli	1 CFU/100 mL	MAC = None Detected (<1)	<1	<1	<1	<1

Anions (Water)

Chloride	1.0 mg/L	AO <= 250	11.0	2.5	2.8	1.3
Fluoride	0.05 mg/L	MAC = 1.5	0.14	0.15	<0.10	0.13
Nitrite (as N)	0.01 mg/L	MAC = 1	<0.01	<0.01	<0.01	<0.01
Nitrate + Nitrite (as N)	0.10 mg/L	MAC = 10	<0.10	<0.10	<0.10	<0.10
Sulfate	10.0 mg/L	AO <= 500	2.3	6.2	10.0	86.3

General Parameters (Water)

pH	1.0 pH units	7.0-10.5	8.0	8.1	8.1	7.8
Alkalinity (total, as CaCO3)	1 mg/L	-	210	250	110	310
Conductivity	1.0 uS/cm	-	210	206	116	354
Colour	1 PtCo units	AO <= 15	2	3	2	3
Turbidity	0.05 NTU	MAC = 1	0.07	0.80	0.10	0.35
Solids, Total Dissolved / TDS	1.0 mg/L	AO <= 500	240	250	140	430

Calculated Parameters (Water)

Nitrate (as N)	0.10 mg/L	MAC = 10	<0.10	<0.10	<0.10	<0.10
Hardness, Total (as CaCO3)	0.500 mg/L	-	88.9	67.8	94.7	287

Total Metals (Water)

Aluminum, total	0.0050 mg/L	OG < 0.1	<0.0050	0.0120	<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	0.00150	0.00262	0.00330	0.00351
Barium, total	0.0050 mg/L	MAC = 1	0.0867	0.0975	0.0545	0.104
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	0.0050 mg/L	MAC = 5	0.0569	0.0598	0.0251	0.119
Cadmium, total	0.000010 mg/L	MAC = 0.005	<0.000010	<0.000010	<0.000010	<0.000010
Calcium, total	0.20 mg/L	-	23.3	17.8	24.5	61.0

Town of Smithers - Drinking water

Work Order: N808190

LAB #			N808190-01	N808190-02	N808190-03	N808190-04
SAMPLED DATE			28-Aug-18	28-Aug-18	28-Aug-18	28-Aug-18
SAMPLED TIME			13:20	13:07	12:47	10:45
SAMPLE ID			19th Ave Well	Victoria St Well	Riverside Well	Airport Before Treatment
	MRL Units	CDWG				
Total Metals (continued)						
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
Copper, total	0.00040 mg/L	AO <= 1	0.00144	0.0139	0.00635	0.00047
Iron, total	0.010 mg/L	AO <= 0.3	<0.010	0.025	0.019	0.103
Lead, total	0.00020 mg/L	MAC = 0.01	<0.00020	0.00111	<0.00020	<0.00020
Lithium, total	0.00010 mg/L	-	0.00296	0.00371	0.00066	0.00187
Magnesium, total	0.010 mg/L	-	7.41	5.67	8.10	32.7
Manganese, total	0.00020 mg/L	AO <= 0.05	0.141	0.0958	0.159	0.685
Mercury, total	0.000010 mg/L	MAC = 0.001	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum, total	0.00010 mg/L	-	0.00413	0.00491	0.00119	0.0117
Nickel, total	0.00040 mg/L	-	<0.00040	<0.00040	<0.00040	<0.00040
Phosphorus, total	0.050 mg/L	-	0.053	0.066	0.061	<0.050
Potassium, total	0.10 mg/L	-	1.46	1.30	0.60	1.86
Selenium, total	0.00050 mg/L	MAC = 0.05	<0.00050	<0.00050	<0.00050	<0.00050
Silicon, total	1.0 mg/L	-	6.7	6.7	5.2	7.8
Silver, total	0.000050 mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050
Sodium, total	0.10 mg/L	AO <= 200	64.5	74.1	13.7	52.5
Strontium, total	0.0010 mg/L	-	0.287	0.262	0.248	0.641
Sulfur, total	3.0 mg/L	-	<3.0	<3.0	4.2	29.8
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	0.0010 mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010
Uranium, total	0.000020 mg/L	MAC = 0.02	0.000673	0.000693	0.000078	0.00211
Vanadium, total	0.0010 mg/L	-	<0.0010	<0.0010	<0.0010	<0.0010
Zinc, total	0.0040 mg/L	AO <= 5	<0.0040	0.0070	<0.0040	0.0075
Zirconium, total	0.00010 mg/L	-	<0.00010	<0.00010	<0.00010	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N808190

LAB #	N808190-05
SAMPLED DATE	28-Aug-18
SAMPLED TIME	11:05
SAMPLE ID	Airport After Treatment

	MRL Units	CDWG	
--	------------------	-------------	--

Bacteriological Parameters (Water)

Total Coliforms	1 CFU/100 mL	MAC = None Detected (<1)	<1
E. coli	1 CFU/100 mL	MAC = None Detected (<1)	<1

Anions (Water)

Chloride	1.0 mg/L	AO <= 250	3.7
Fluoride	0.05 mg/L	MAC = 1.5	0.13
Nitrite (as N)	0.01 mg/L	MAC = 1	<0.01
Nitrate + Nitrite (as N)	0.10 mg/L	MAC = 10	<0.10
Sulfate	10.0 mg/L	AO <= 500	85.8

General Parameters (Water)

pH	1.0 pH units	7.0-10.5	8.0
Alkalinity (total, as CaCO3)	1 mg/L	-	320
Conductivity	1.0 uS/cm	-	384
Colour	1 PtCo units	AO <= 15	3
Turbidity	0.05 NTU	MAC = 1	0.38
Solids, Total Dissolved / TDS	1.0 mg/L	AO <= 500	490

Calculated Parameters (Water)

Nitrate (as N)	0.10 mg/L	MAC = 10	<0.10
Hardness, Total (as CaCO3)	0.500 mg/L	-	12.4

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	0.00287
Barium, total	0.0050 mg/L	MAC = 1	0.0060
Beryllium, total	0.00010 mg/L	-	<0.00010
Bismuth, total	0.00010 mg/L	-	<0.00010
Boron, total	0.0050 mg/L	MAC = 5	0.120
Cadmium, total	0.000010 mg/L	MAC = 0.005	0.000011
Calcium, total	0.20 mg/L	-	2.58
Chromium, total	0.00050 mg/L	MAC = 0.05	0.00066

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N808190

LAB #	N808190-05
SAMPLED DATE	28-Aug-18
SAMPLED TIME	11:05
SAMPLE ID	Airport After Treatment

	MRL Units	CDWG	
Total Metals (continued)			
Cobalt, total	0.00010 mg/L	-	<0.00010
Copper, total	0.00040 mg/L	AO <= 1	0.0210
Iron, total	0.010 mg/L	AO <= 0.3	0.025
Lead, total	0.00020 mg/L	MAC = 0.01	0.00029
Lithium, total	0.00010 mg/L	-	0.00117
Magnesium, total	0.010 mg/L	-	1.43
Manganese, total	0.00020 mg/L	AO <= 0.05	0.0103
Mercury, total	0.000010 mg/L	MAC = 0.001	<0.000010
Molybdenum, total	0.00010 mg/L	-	0.0112
Nickel, total	0.00040 mg/L	-	<0.00040
Phosphorus, total	0.050 mg/L	-	<0.050
Potassium, total	0.10 mg/L	-	1.50
Selenium, total	0.00050 mg/L	MAC = 0.05	<0.00050
Silicon, total	1.0 mg/L	-	7.6
Silver, total	0.000050 mg/L	-	<0.000050
Sodium, total	0.10 mg/L	AO <= 200	178
Strontium, total	0.0010 mg/L	-	0.0205
Sulfur, total	3.0 mg/L	-	29.6
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	0.0010 mg/L	-	<0.0010
Uranium, total	0.000020 mg/L	MAC = 0.02	0.00206
Vanadium, total	0.0010 mg/L	-	<0.0010
Zinc, total	0.0040 mg/L	AO <= 5	0.0064
Zirconium, total	0.00010 mg/L	-	<0.00010

ANALYTICAL REPORT

Town of Smithers - Drinking water

Work Order: N808190

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
CFU/100 mL	Colony Forming Units per 100 mL
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PtCo units	Platinum Colbalt colour units
uS/cm	Micro Siemens per centimeter
MAC	Maximum Acceptable Concentration. Values above MAC are formatted with red text and solid outline.
AO	Aesthetic Objective (not health related). Values above AO are formatted with a dashed outline.
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf
------	--