

## 108 Waterworks Annual Report

In accordance with Interior Health Permit No. 14-124-00001 for 108 Waterworks; the following is an annual report on the status of the 108 Waterworks for the period of June 2015 to June 2016.

The report contains:

- An overview of maintenance for the system
- Average daily water flows
- Results of bacteriological and chemical water testing
- Well Head Protection Plan
- Groundwater Supply

Please forward questions or concerns to the Cariboo Regional District Environmental Services Department at (250) 392-3351 or 1-800-665-1636.

### **Electoral Areas**

A – Red Bluff-Quesnel South • B – Quesnel West-Bouchie Lake-Ten Mile • C – Barlow-Bowron • D – Wildwood-McLeese Lake  
E – Esler-Dog Creek • F – Horsefly-Likely-150 Mile House • G – Lac La Hache-108 Mile House • H – Canim Lake-Forest Grove  
I – Narcosli-Nazko • J – West Chilcotin • K – East Chilcotin • L – Lone Butte-Interlakes

### **Municipalities**

Quesnel • Wells • Williams Lake • 100 Mile House

## 108 Waterworks Maintenance Schedule

Inspect the total supply area for signs of leaks or abuse of the water system – weekly

Check pump houses to ensure proper operation of the pumps and automatic pump-up system – twice per week.

Service pumps including testing of any standby pumps, and any minor maintenance and cleanup – monthly.

Obtain water samples and deliver to Interior Health – monthly for bacteriological and yearly for chemical.

Clean inside of buildings, paint pipes as required and clear weeds around building annually or as required.

Check heating system in the pump houses during the winter months.

Twice per year, service all fire hydrants and standpipes and ensure clear access. Paint hydrants, standpipes and valve boxes as required.

Flush distribution pipelines 2 times per year and exercise all isolating gate valves.

Reservoirs are cleaned once per year in the spring.

Inspect storage tanks during winter months for any signs of freezing or icing problems. Clean, flush and disinfect annually.

As requested, test and inspect all new water connections, and attend to water service turn-off and turn-on.

Attend to unscheduled inspections, emergency calls and repairs as appropriate.

**2016**  
**108 Water System**  
**Average Daily Water Flows**

<u>Month</u>	<u>Cubic Meters</u>	<u>Imperial Gallons</u>
June	1400	308,000
July	1386	304,920
August	1252	275,440
September	732	161,040
October	638	140,360
November	569	125,180
December	574	126,280
January	614	135,080
February	652	143,440
March	654	143,880
April	717	157,894
May	1187	261,140
June	1176	258,720

**108 Waterworks  
Microbiological Monthly Monitoring – June 2014 to June 2015**

Month	Sampling Point	Total Coliforms Results	E. coli
June 2015	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Telqua	< 1	< 1
July 2015	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Telqua Drive	< 1	< 1
	Sepa Well	< 1	< 1
August 2015	Telqua Drive	<	< 1
	Kitwanga Place	1	< 1
	Kylo Road	3	< 1
	Easzee Drive	2	< 1
	Sepa Well	< 1	< 1
September 2015	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Kylo Road	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
October 2015	Kylo Road	< 1	< 1
	Easzee Drive	< 1	< 1
	Kitwanga Drive	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
November 2015	Kitwanga Drive	< 1	< 1
	Easzee Drive	< 1	< 1
	Kylo Road	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
December 2015	Kylo Road	< 1	< 1
	Kitwanga Drive	< 1	< 1
	Easzee Drive	< 1	< 1
	Telqua	< 1	< 1
	Sepa Well	< 1	< 1
January 2016	Easzee Drive	< 1	< 1
	Kitwanga Place	< 1	< 1
	Kylo Road	< 1	< 1

January 2016 cont.	Telqua Sepa Well	< 1 < 1	< 1 < 1
February 2016	Easzee Drive Kitwanga Place Kylo Road Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
March 2016	Kylo Road Kitwanga Place Easzee Drive Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
April 2016	Easzee Drive Kylo Road Kitwanga Place Telqua Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
May 2016	Kitwanga Place Kylo Road Easzee Drive Telqua Sepa Well	2 3 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1
June 2016	Telqua Easzee Drive Kylo Road Kitwanga Place Sepa Well	< 1 < 1 < 1 < 1 < 1	< 1 < 1 < 1 < 1 < 1

Bacteriological tests are performed routinely for total coliforms and E. coli. The water is considered safe when no sample contains more than 10 total coliform organisms per 100 ml and no E.coli is present.

**WATER QUALITY MONITORING**  
**108 WATERWORKS**  
**CHEMICAL ANALYSIS**  
July 12, 2016

Parameters	Sampling Point Sepa Well #2 Readings	Maximum Acceptable Concentration (MAC) – limit	Aesthetic Objective (AO) - limit
<b>Conventional Parameters</b>			
PH, Laboratory	8.23 PH units		6.5-8.5 PH units
True Color	<5 CU		15 CU
Turbidity	0.64 NTU	1 NTU	≤ 5 NTU
Total Dissolved Solids	734 mg/L		500 mg/L
Dissolved Chloride	78 mg/L		250 mg/L
Dissolved Sulphate	74.2 mg/L		500 mg/L
Hardness	521 mg/L		500 mg/L
Nitrate and Nitrite	.594 mg/L	45 mg/L	
Nitrite	.0228 mg/L	1 mg/L	
<b>Total Metals Analysis</b>			
Mercury	< 0.010 ug/L	1 ug/L	
Arsenic	1.78 ug/L	10 ug/L	
Barium	13.3 ug/L	1000 ug/L	
Boron	78 ug/L	5000 ug/L	
Cadmium	<0.010 ug/L	5 ug/L	
Chromium	<1 ug/L	50 ug/L	
Lead	< 0.20 ug/L	10 ug/L	
Selenium	< 0.10 ug/L	50 ug/L	
Uranium	4.61 ug/L	20 ug/L	
Copper	1.46 ug/L		1000 ug/L
Iron	<5 ug/L		300 ug/L
Manganese	426 ug/L		50 ug/L
Zinc	<5 ug/L		5000 ug/L

CU = color units

mg/L = milligrams per liter

≤ Less than or equal to detection limit

NTU = nephelometric turbidity units

< = less than detection limit

ug/L = micrograms per liter

**MAC** – This standard sets the maximum acceptable concentration for various substances in the water. Concentration of a given substance above the MAC could be hazardous to health.

**AO** – This standard determines acceptable appearance (cloudiness), smell or taste of the water being tested.

## 108 Waterworks Well Head Protection Plan

The 108 waterworks obtains its water from two large groundwater wells and water quality is considered to be excellent from a health perspective. However, some staining of clothes and plumbing fixtures can occur from higher levels of manganese contained in the water. Protection of the ground water is needed to ensure that future generations can continue to utilize a safe water source.

Experience from elsewhere in Canada, the U.S. and Europe shows that preventing water quality degradation by implementing a well protection plan is the best way to protect a community well water supply. A well protection plan contains realistic protective measures to manage activities in the capture zone (or recharge area) to reduce the risk of contaminating the well supply.

The Ministry of Health in conjunction with the Ministry of Environment and the Ministry of Municipal Affairs have developed procedures and guidelines for the development and implementation of a well head protection plan. The various steps in the planning process include:

- 1) Form a planning team;
- 2) Define the capture zone (recharge area) of the community well;
- 3) Map potential sources of pollution in the capture zone;
- 4) Develop and implement protection measures to prevent pollution;
- 5) Develop a contingency plan against any accidents; and
- 6) Monitor, evaluate, and report on the plan annually.

The Cariboo Regional District, with grant funds that it has received from the Federal Government under the Community Works Fund, has retained the services of an environmental consultant to complete the various steps as listed above.

## **108 WATERWORKS GROUNDWATER SUPPLY AND TREATMENT PLANT**

The Cariboo Regional District has been performing an ongoing investigation of the effects that the existing groundwater supply wells are having on the water levels of the 108 and Sepa Lakes. Kala Geosciences concludes that the withdrawal of groundwater does affect lake levels by up to 33% during drought conditions such as those that have occurred over the past few years. The wells are not drawing water directly from the lakes, but rather are intercepting groundwater that would otherwise support lake levels during drought conditions. Kala also reported that the monitoring revealed that the aquifer to the north of the 108 Mile Ranch subdivision is not associated with maintaining the lake levels during drought periods. Further testing completed in 2015 has confirmed that this aquifer can be utilized, allowing the CRD to reduce or eliminate its use of the current wells.

Construction of the water treatment plant to remove Manganese will start in the spring of 2017. The Cariboo Regional District originally anticipated that some of the construction could commence in 2016. Unfortunately, the supplier of treatment equipment could not meet the target dates to allow the construction to commence. At this time, all the detailed engineering and associated public tendering documents are being produced so that actual construction can commence as early as possible in 2017.