

Town of Russell
Public Water System Annual Report
2009



Name of the Public Water System: Town of Russell Public Water System

Name of the Legal Owner: Town of Russell

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Date prepared: February 5th, 2010

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Introduction:

The 2009 Annual Report for the Town of Russell summarizes the Water Utility's ability to produce safe potable water and meet provincial regulations.

1. Description of the Water System:

The Town of Russell Public Water System provides potable drinking water to a population of 1611 residents (2006 Census). Treated water produced at the water treatment plant meets all health and aesthetic objectives as stated in the guidelines for Canadian Drinking Water Quality.

1.1 Water Supply Source:

The Town of Russell Water Treatment Plant receives ground water from 2 wells located approximately 9 kilometers northeast of Russell. Specifically the wells are located on the SE ¼ 17-21-27 WPM. The 2 wells draw ground water from a large sand and gravel aquifer. The raw water from the wells is pumped into a 200 mm pipeline and flows to the Town of Russell Water Plant for treatment.

Well No. 1 was originally drilled in 1983 at a depth of approximately 60 feet. A second well was also developed in 1983 but collapsed in 2000 and is no longer used. In the spring of 2000 a third well was drilled into the aquifer at a depth of 80 feet. Both wells remain active and are the exclusive sources of water for the Town of Russell. The Town follows a maintenance program for the wells which includes jetting them annually with compressed air.

As the water flows through the ground it dissolves metals and minerals. In the case of the aquifer accessed by the Town of Russell, the water has come into contact with iron, manganese and calcium carbonate (hardness causing mineral). These items do not pose health concerns, rather they are known as aesthetic water quality parameters.

1.2 Water Treatment Process:

Iron and manganese are metals that cause laundry and plumbing fixture staining problems. In addition, these materials can build up in the distribution pipes and cause reduced flow. Calcium carbonate causes hardness in water, which diminishes the ability of the water to react with soap and form lather. Hardness also forms scale deposits in kettles and hot water tanks which can reduce the life expectancy of these appliances.

The current water treatment process, which consists of the use of lime soda ash, is designed to remove iron and manganese to acceptable levels and soften the water down to a total hardness averaging 140 mg/L. With regards to hardness, people have individual preferences about the amount of hardness they desire in their water. Individual homeowners, who desire softer water, have the ability to install softeners.

Once the hardness of the water has been addressed, chlorinating and fluoridation occurs. Treated water is then stored in a treated water reservoir located beneath the plant.

1.3 Distribution System:

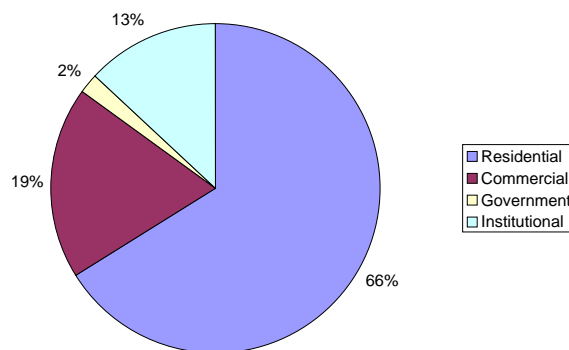
Treated water from the Plant is stored in the underground reservoir or pumped to the Town of Russell Water Tower via a one of two 397 GPM pumps. Water is then distributed to the community from the water tower providing steady pressure and constant flow with few operational costs because the gravity is used to move the water. The distribution system has an approximate piped length of 28 kilometers. Piping is comprised of 65% cast iron and 35% PVC.

1.4 Storage Reservoirs:

Treated Reservoir – Underground – 1 million litres.
Treated Reservoir - Water Tower - 225,000 litres.

1.5 Connections, Population and Types of Users:

The Town of Russell distribution system is comprised of - 788 service connections. All service connections are metered. Water is provided to a large demographic (see graph).



1.6 Classification and Certification:

- The Town of Russell Water Treatment Plant is a Class II Water Facility.
- Current operators of the facility and their certification levels are as follows:
 - Steven Smith Water Treatment Plant Operator Level II
 - Chad Preston Water Treatment Plant Primary Relief Operator Operator in Training
 - Tim Kiliwnik Water Treatment Plant Relief Operator Level II

2. Disinfection System in Use:

The final step in the treatment of safe water is disinfection. Disinfection is the selective destruction or inactivation of potential disease causing organisms in water. As per the *Drinking Water Safety Act* the Town of Russell PWS must ensure that a disinfectant residual of at least:

- 0.5 mg of free chlorine per litre of water is detectable at the point where water enters the distribution system, after a minimum contact time of 20 minutes.
- 0.1 mg of free chlorine per litre of water is detectable at all times at any point in the distribution network.

2.1 Type of disinfection system used:

The Town of Russell WTP disinfects by adding 12% sodium hypochlorite solution to water via a chlorination pump.

2.2 Equipment redundancy and monitoring requirements

As required by the *Drinking Water Safety Act* the Town of Russell PWS ensures continuous disinfection is maintained at the plant by keeping in stock all spare parts required for the chlorination pump. A complete spare chlorination pump is also kept at the plant.

Disinfectant residuals are monitored daily at the water treatment plant and periodically in the distribution system and recorded on the appropriate monitoring forms. Monthly chlorination report forms are sent to the regional Drinking Water Officer at the end of each month.

2.3 Disinfectant residual overall performance/results:

For 2009, the Town of Russell Public Water System has met all regulatory requirements in regard to monitoring and reporting disinfection residuals leaving the water treatment plant and in the distribution system. (see Table 1).

Table 1 - Disinfection Monitoring and Reporting		
Chlorine Requirements	Regulatory Requirement	PWS Performance
A) Free chlorine residual entering the distribution system Section 21 (1) a - MR 40/2007	≥ 0.5 mg/L	100%
B) Free chlorine residual in the distribution system Section 22 a - MR 40/2007	≥ 0.1 mg/L	100%
C) Frequency of testing Schedule A - MR 40/2007	Daily	100%
	Bi-Weekly	100%
D) Report submissions Section 25 (2) - MR 40/2007	Monthly	100%
Comments: The Public Water System has met the regulatory requirements for 2009.		

3. List of Water Quality Standards:

The Province of Manitoba has adopted a number of water quality standards from the *Guidelines for Canadians Drinking Water Quality*, developed by Health Canada. The parameters are health-based and they express the maximum acceptable concentration for a groundwater supply source. Concentration values in excess constitute a health-related issue and require corrective actions. The 2009 results for the Town of Russell Public Water system are summarized in the following tables (see Table 2 & 3):

Table 2 - Bacteriological Monitoring and Reporting		
	Regulatory Requirement	PWS Performance
Number of raw/incoming water samples Schedule A - MR 40/2007	52	100%
Number of treated water samples Schedule A - MR 40/2007	52	100%
Number of distribution water samples Schedule A - MR 40/2007	52	100%
Frequency of testing Schedule A - MR 40/2007	Bi-Weekly	100%
Total coliform present in water samples Section 3 (1) b - MR 41/2007	0 TC per 100mL	100%
E. coli present in water samples Section 3 (1) a - MR 41/2007	0 EC per 100mL	100%
Comments: The Public Water System has met the regulatory requirements for 2009.		

Table 3 - Chemical Water Quality Standards		
Schedule B - MR 41/2007	Regulatory Requirement	PWS Performance
Arsenic	0.010 mg/L	0.0059 mg/L
Benzene	0.005 mg/L	n/a
Fluoride	1.5 mg/L	1.00 mg/L
Lead	0.010 mg/L	0.0003 mg/L
Nitrate	as nitrate: 45mg/L as nitrogen: 10mg/L	0.2 mg/L
Tetrachloroethylene	0.03 mg/L	< 0.001 mg/L
Trichloroethylene	0.005 mg/L	< 0.001 mg/L
Uranium	0.02 mg/L	< 0.001 mg/L
Comments: In 2007 the ODW took samples for general chemistry including the above parameters with the exception of Benzene, Section 4.7, Table 2 of the current Russell Operating License outlines a new change to owners responsibility for sampling requirements.		

4. Water System Incidents and Corrective Actions

Incident 1: January 7, water break at 426 Arsini Street E. Repaired water line which impacted 17 houses for a total of 6 hours. Line was repaired, chlorinated and hydrant flushed.

Incident 2: March 10, water break at 409 Augusta Street W. Removed damaged water valve located just prior to the water plant on the main line from the Town of Russell wells. No houses were impacted. Line was repaired, no chlorination since break was prior to the treatment plant.

Incident 3: November 22, water break on Russell Street between Ellice Avenue and Shell River Avenue which impacted 2 businesses for a total of 49 hours. Pipe was repaired with a robar clamp, chlorinated and hydrant flushed.

Incident 4: December 7, water break at 426 Manitoba Avenue East. Repaired water line which impacted 16 houses for a total of 24 hours. Line was repaired with a robar clamp, chlorinated and hydrant flushed.

5. Additional records required

No requests for additional records were received in 2009.

6. Drinking Water Safety Orders on your System and Actions Taken in Response:

In 2009, no Drinking Water Safety Orders were issued for the Town of Russell Public Water System.

7. Boil Water Advisories Issued and Actions Taken in Response:

In 2009, no Boil Water Advisories were issued for the Town of Russell Public Water System.

8. Warnings Issued or Charges Laid on the System in Accordance with The Drinking Water Safety Act:

In 2009, no Warnings were issued or Charges laid on the System.

9. Major Expenses Incurred

In 2009, no major expenditures were incurred in conjunction with the Russell Public Water System.

10. Future System Expansion and/or Increased Production

The Town of Russell is investigating the expansion and upgrading of the Town's water treatment plant. Projected date for the water plant upgrade is 2012 and the projected cost is \$3,000,000.