

Public Water System Annual Report 2009



Name: Town of Neepawa water treatment plant

Name of Owner: Town of Neepawa

Chief Administrative Officer: Allison Bardsley

Director O&M: Gerry Irving

Water Superintendent: Shabbir Sakrani

Operators: Howard Buffi, Kevin Enns,
Dwayne Crandell

1. Introduction	3
2. Description of the Water System.....	3
2.1. <i>Water Supply Source.....</i>	3
2.2 <i>Water Treatment Process.....</i>	3
2.3 <i>Storage Reservoir.....</i>	4
2.4 <i>Raw water treated</i>	4
2.5 <i>Classification and Certification.....</i>	5
3. List of Water Quality Standards	5
3.1 <i>Disinfection Monitoring and Reporting</i>	5
3.2 <i>Bacteriological Monitoring and Reporting.....</i>	6
3.3 <i>Physical Standards Monitoring and Reporting</i>	7
3.4 <i>Disinfection By-products Monitoring and Reporting</i>	8
3.5 <i>Water Analysis Report 2009</i>	9
3.6 <i>Water System Incidents & Corrective Actions.....</i>	10
3.7 <i>Drinking Water Safety orders & Charges</i>	10
3.8 <i>Boil water orders & action taken in response</i>	11
3.9 <i>Major Expenses Incurred.....</i>	11

Introduction:

Public water system, Town of Neepawa “Annual Report” summarizes the water utility’s ability to produce safe potable water and comply with provincial regulations.

2. Description of the Water System

The Town of Neepawa water treatment facility provides potable drinking water to a population of approximately 3500 residents and a number of business units. The Town of Neepawa water treatment system fulfilled its obligation in 2009 in complying with Manitoba *Drinking water safety Act regulations*.

2.1 Water Supply Source

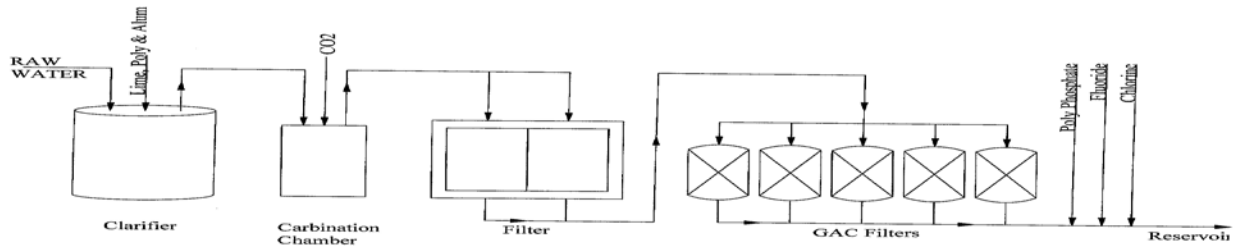
The Town of Neepawa water treatment plant obtains its raw water from man-made shallow Lake Irwin, a small artificial lake located approximately two kilometers south-east of Town. Raw water is fed via gravity flow to the plant for safe drinking water as per provincial regulations and guidelines.

2.2 Water treatment Process

Present water process system was upgraded in 1995, it can treat up to 50 liter/second and it consists of the following process stages.

- Chemical coagulation, flocculation and settling in a single contact clarifier. Aluminum sulphate and polymer are added for coagulation and calcium oxide (lime) is added for reduction of carbonate hardness in the clarifier.
- Detention time in clarifier is about 2-2.5 hours
- Carbon dioxide gas is introduced for carbonate saturation in carbonation chamber.
- Water leaving carbonation chamber filters through Multimedia rapid gravity filters.
- Filtered water passes through Granular activated carbon pressure filters to eliminate odor and color causing compounds.
- Water is then added with chlorine gas as disinfection chemical.
- Addition of polyphosphate for corrosion control in distribution system.
- Fluoride is finally added for dental health.

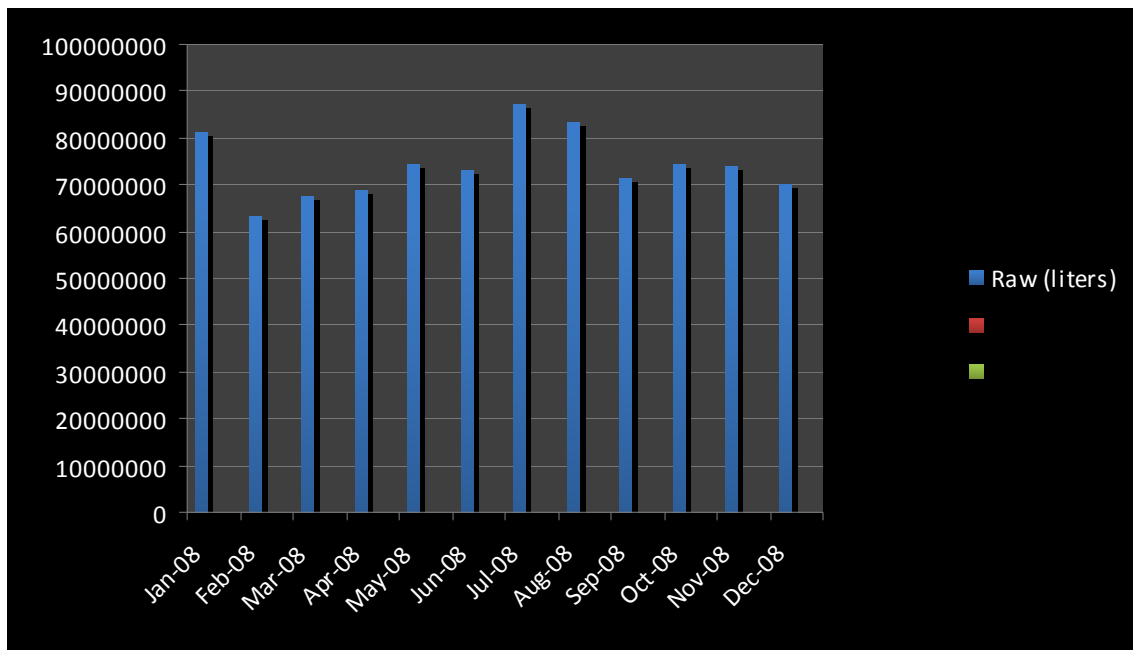
Following process flow diagram (PFD) describes the Neepawa water system.



2.3 Storage Reservoir

The water treatment plant has two treated water storage reservoirs; one under the original 1962 plant, the second under the 1995 addition. The storage volumes of two reservoirs are 587 and 670 cubic meters for total volume of 1277 cubic meters at the plant. In addition, the Town has a water tower with a storage volume of approximately 2180 cubic meters. Thus, the total available storage is 3457 cubic meters or 3457000 liters.

2.4 Raw water treated 2009



Raw water in liters/Month

2.5 Classification and Certification

The Town of Neepawa water treatment plant is designated a Class 3 facility by the Province of Manitoba.

Supervisor Certification Level is:

Shabbir Sakrani: Level 3 Certification

The Operators Certification level is:

Howard Buffi: Level 3 Certification

Kevin Enns Level 3 Certification (Conditional)

Dwayne Crandell : Level 3 Certification (Conditional)

3. List of Water Quality Standards

The Province of Manitoba has adopted a number of water quality standards from the Health Canada *Guidelines for Canadian Drinking Water Quality*. The health-based parameters express the maximum acceptable concentrations for drinking water. Concentration values in excess of the guidelines constitute a health-related issue and require corrective actions. Public water systems are required to monitor chlorine levels and undertake regular bacterial testing. The 2009 results for the Town of Neepawa water treatment system are as follows:

3.1 Disinfection Monitoring and Reporting

	Regulatory requirement	PWS Performance
Free chlorine residual entering the distribution system Section 21(1) a - MR 40/2007 - $(364/365) \times 100 = 99.7\%$	≥ 0.5 mg/L	99.70%
Frequency of testing entering the distribution system Schedule A - MR 40/2007	Daily	100%
Free chlorine residual in the distribution system Section 22 a - MR 40/2007	≥ 0.1 mg/L	100%
Frequency of testing in the distribution system Schedule A - MR 40/2007	Bi-weekly	100%
Report submissions Section 25(2) - MR 40/2007	Monthly	100%
<u>Comments:</u> The regulatory requirements were met for 2009.		

3.2 Bacteriological Monitoring and Reporting

	Regulatory requirement	Neepawa plant performance
Number of raw/incoming water samples - one sample biweekly Schedule A - MR 40/2007	26	100%
Number of treated water samples -3 samples biweekly Schedule A - MR 40/2007	26	100%
Number of distribution water samples - two samples each week Schedule A - MR 40/2007 - 62 samples submitted	26	100%
Frequency of testing Schedule A - MR 40/2007	Biweekly	100%
Total Coliform present in samples Section 3(1) b - MR 41/2007	0 TC per 100ml	99%
E. Coli present in samples Section 3(1) a - MR 41/2007	0 EC per 100ml	100%

Comments: [The regulatory requirements were met for 2009.](#) Summary of test results attached.

Voluntary extra distribution samples are submitted at each sampling period. The ten Springhill samples submitted are included in the above distribution system totals.

* One distribution system water sample was reported positive for Total Coliform at 1 TC/100mL. The Operators submitted a Corrective Action Report that described the steps taken to address the positive result and the re-sample did not confirm the initial positive result. Because of the corrective actions taken and submission of the report form, the water system was deemed to be in compliance with provincial regulations.

3.2 Physical Standards Monitoring and Reporting

Turbidity Standards	Regulatory Requirement	PWS Performance
Chemically assisted, rapid gravity filtration process Section 6(1) a - MR 41/2007	≤ 0.3 NTU in at least 95% of the samples taken per month - not including the April spring run-off period	100 % *
not including the April spring run-off period software not installed for this calculation - inferred from average readings	not to exceed 0.3 NTU for more than 12 continuous hours where continuous measurements are taken	100%*
filter 1 / filter 2	not to exceed 1.0 NTU at any time	68% / 76% **
Frequency of testing Schedule B - MR 40/2007	Daily portable - raw and reservoir outflow continuous on-line - filter effluent	100%
Report submissions Section 31(2) - MR 40/2007	Monthly	100%
<p><u>Comments:</u> on-line measurement reporting The regulatory requirements for turbidity standards were met for 2009.</p> <p>* Corrective Action Report forms were submitted for the turbidity exceedence events. The 100% performances do not include the April and May 2009 spring run-off that caused unusually difficult treatment conditions.</p> <p>** A filter-to-waste feature as part of the backwash cycle must be part of an upgrade to the filtration system. The exceedences are spikes occurring after filter backwash cycles.</p>		

3.4 Disinfection By-products Monitoring and Reporting

note: 1 mg/l = 1000 µg/L

	Regulatory Requirement	PWS Performance
Trihalomethane sampling requirements		
Section 5(1) - MR 41/2007	4 times per year	100%
Total Trihalomethane Standard - Schedule B - MR 41/2007	100 µg/L	2008 average 140 µg/L
Bromodichloromethane sampling requirements		
Section 5(1) - MR 41/2007	4 times per year	100%
Bromodichloromethane Standard (see comment) Schedule B - MR 41/2007	previously 16 µg/L	n/a see comment

Comments:

Trihalomethane testing is required every second year, so none was needed in 2009.

A summary of the 2008 test results that were sent with the 2008 audit are re-attached here

[The Neepawa PWS met the regulatory requirements for disinfection by-products for 2008.](#)

Quarterly sampling is being done by your WTP Operators again in 2010, as per your PWS licence.

Bromodichloromethane (BDCM) standard:

Manitoba water utilities are no longer required to meet the 16 µg/L (0.016 mg/L) BDCM standards. Health Canada initially established the BDCM guideline because the science at the time indicated that there may be acute health effects associated with the compound. Following Health Canada's lead, Manitoba adopted the guideline as a water quality standard. More recent research suggests that BDCM does not have an acute health effect and Health Canada has subsequently rescinded the separate guideline for BDCM. Reference to the BDCM standard will be removed from the Operating Licence when it is renewed.

BDCM continues to be a component of the Total THM guideline and their concentrations will be monitored accordingly. Utilities must continue to make every effort to maintain THM concentrations (including BDCM) as low as reasonably achievable without compromising the effectiveness of disinfection.

Regulatory Requirement PWs Performance

Haloacetic Acids (HAA)	TBA	n/a
<p>2008 ODW Chemical Analysis - 21/7/08 - mid-distribution - town office - 45 µg/L</p> <p>2009 ODW Chemical Analysis - 11/8/09 - wtp treated - mid distribution - office - end distribution - munro</p>		<p>51 µg/L 52 µg/L 28 µg/L</p>
<p><u>Comments:</u> Haloacetic acids (HAA) are chlorine disinfection by-products found in drinking water along with trihalomethanes. In 2008, Health Canada established a maximum acceptable concentration of 80µg/L (0.080 mg/L) for HAA based on a locational running annual average of a minimum of quarterly samples taken in the distribution system. It is anticipated that this guideline will be adopted as a standard in Manitoba. Utilities will be notified when they will be required to start a monitoring and reporting routine. The Office of Drinking Water has done some HAA analysis testing to compile background data. The haloacetic acid levels measured in these samples were below the guideline value.</p>		

3.5 Water Analysis Report 2009

The Office of Drinking Water submitted water samples from the **Neepawa PWS** for chemical analysis on August 11, 2009. This is considered to have fulfilled the general chemistry monitoring requirement of Operating Licence.

All parameters measured in the treated water met the applicable health-based maximum acceptable concentrations (MAC) and aesthetic objectives set by the *Guidelines for Canadian Drinking Water Quality (GCDWQ)*.

The Office of Drinking Water has determined that it will continue to undertake general chemistry sampling for 2010 on behalf of water utilities. However, this policy may change in the future. The link to Health Canada's *Guidelines for Canadian Drinking Water Quality* website is:

http://www.hc-sc.gc.ca/ewh-semt/water-eau/drink-potab/guide/index_e.html

Following tables show lab results of Treated and Raw water samples collected during 2009, a complete lab report is available on a written request to the Town.

Physical Test				
Analyte	Unit	Limit*	Neepawa Raw	Neepawa Treated
Color ,True	T.CU	15	50	5
Conductivity	umhos/cm		411	344
Hardness as cacO3	mg/L		237	136
P H	PH Unit	6.5-8.5	9.03	7.72
Total Dissolved solids	mg/L	500	312	240
Turbidity	NTU		25	0.8
Limit * is Aesthetic objectives for Canadian Drinking Water Quality				

Total Metals (Water)					
Analyte	Unit	Limit 1*	Limit 2*	Neepawa Raw water	Neepawa Treated water
Aluminum	mg/L	0.1		0.414	0.167
Antimony	mg/L		0.006	<.00020	<.00020
Arsenic	mg/L		0.01	0.032	0.00266
Cadmium	mg/L		0.005	<.000067	0.000011
Chromium	mg/L		0.05	<.0010	<.0010
Copper	mg/L	1		0.0041	0.0068
Iron	mg/L	0.3		1.02	<.020
Lead	mg/L		0.01	0.000683	<.000090
Manganese	mg/L	0.05		0.311	0.00095
Sodium	mg/L	200		12.6	13.5
Uranium	mg/L		0.002	0.002002	<.00010
Limit 1 * GCDWQ-Aesthetic Objectives					
Limit2 * GCDWQ-Maximum Acceptable Concentration					

3.6 Water System Incidents and Corrective Actions

There were no major water system incidents in 2009. Corrective actions were taken and reported as required for normal minor variations during the course of routine operations.

3.7 Drinking Water Safety Orders, Warnings, and Charges

There were no Drinking Water Safety Orders or warnings issued, nor were any charges laid on the system.

3.8 Boil Water Orders and Actions Taken in Response:

In 2009, no Boil Water Orders were issued for the Town of Neepawa Water System.

3.9 Major Expenses Incurred:

Granular Activated Carbon media was replaced, Replacement of Raw water pump, Sludge pump, fluoride pump, Replacement of Raw water intake rusted pipe with PVC pipe.

The Town water system staff members received educational upgrades through Red River College, correspondence and related seminars.