



Town of Morden **Public Water System Annual Report 2008**

This report is available online at the Town of Morden website - www.mordenmb.com as of March 31st, 2009

Email Town address is: tmorden@mordenmb.com

Paper copies are available at the Morden Civic Center office at 100-195 Stephen St.

Notifications will be in the quarterly water bills, the Quarterly Newsletter and on the Town of Morden website, indicating how users can acquire copies of the report.



Town of Morden Annual Water System Operation Report 2008

Where does our water come from?

The Town of Morden gets its water supply from Lake Minnewasta. Lake Minnewasta is a reservoir created by the construction of a PFRA dam on Dead horse Creek. The reservoir is approximately 1.4 km long and 500m wide at its widest point. The watershed of the creek upstream from the reservoir encompasses about 130 sq km of land area.

Why do we treat our water?

We treat our water to ensure that safe and pleasing drinking water is supplied to the homes and businesses in the Town of Morden. Provincial Regulations have set health based drinking water standards for all public water systems and are becoming more stringent all the time. The Town of Morden is committed to meeting or exceeding these new standards set by the province to provide the best tap water possible to the Town of Morden.

What type of treatment do we use?

Due to the high hardness count (400-600 Mg/l) of Morden's raw water supply we use a Lime- Soda Ash softening process followed by filtration. These processes are designed to soften and clarify the water and remove microbial contaminants, such as bacteria and organic materials that are naturally found in lake waters.

Why and how do we disinfect our water?

The final step in the treatment of safe drinking water is disinfection. Disinfection is the selective destruction or inactivation of disease causing organisms in water. The Drinking Water Safety Act and Office of Drinking Water require that water is disinfected to a set standard before it leaves the water treatment plant and that an adequate amount is maintained in the distribution system to ensure the water is safe right to the consumer's tap. The Town on Morden disinfects its water through chlorination. Chlorine is added to kill bacteria and viruses that are commonly found in surface waters such as rivers and lakes. An adequate amount of Chlorine is added before the water leaves the treatment plant to ensure an effective kill of bacteria and to provide a disinfectant residual throughout the distribution system to combat any contamination in the system.

Are chemicals added to our water? Why?

We add Powder Activated Carbon and Fluoride to the water

Powder Activated Carbon is added to the water to help control taste and odour issues caused by Algae etc.

Fluoride is added as part of the Provincial Fluoridation Program at regulated levels to help prevent tooth decay. This process is monitored by Manitoba Health and Health Living.

How much water storage do we have?

When the new water plant was built a 450,000 gal reservoir was built underneath it. We also have a water tower and elevated standpipe with a combined capacity of 750,000 gals for a total capacity of 1.2 million gallons. At current levels of water use that works out to 1 to 2 days worth of storage.

What is the “distribution system”?

The system is a network of underground pipes that supply water to all areas of Town. The chart shown below identifies the type and length of water main piping in service.

Type of Waterline	Total Meters
Asbestos cement	36273.21
Ductile iron	1760.08
PVC	30800

The mains are flushed through hydrants and regular maintenance including hydrant testing is done annually usually in fall.

Is our water tested? What for? When?

Water tests are taken on a routine basis to ensure the quality and safety of our water and to monitor how well the treatment facility is operating. We daily test the water at the water plant for: Chlorine residual, hardness, PH, turbidity, Alkalinity, Fluoride. All water test results associated with water safety are submitted to the Office of Drinking Water for review. The tests sent to The Office of Drinking Water are: Bacterial tests, Trihalomethane , Turbidity and Chlorine. Flouride results are sent to Manitoba Health and Health Living.

Bacterial testing: We test the raw water (untreated lake water), the treated water leaving the plant, and the water in the distribution system, every two weeks for the presence of Total coliforms and E-Coli bacteria at a provincially accredited lab in Wpg.

Disinfectant testing is done daily on water leaving the plant and monitored via on-line continuous monitoring similar to Turbidity below. Chlorine levels are also tested in the distribution system every time we take samples for bacterial sampling to ensure there is a proper Chlorine residual in the system.

Turbidity testing is done via on-line continuously monitoring equipment and verified daily by desktop testing. Turbidity is measurement of the clarity of the water and is used to determine how well our treatment system is working.

Trihalomethane (THM) testing: Trihalomethanes are formed when chlorine reacts

with naturally occurring organic matter in the water. The province has set a standard based on an average of four samples per year. We test THM levels in two locations on a quarterly basis.

Fluoride sampling: Daily sampling of Fluoride levels are done at the water plant and every two weeks a composite sample for that period is submitted for testing and verification at a provincially credited lab.

In addition to the above a detailed chemical analysis is performed each year.

What are the results of the tests? Are copies available?

As a result of the testing the Office of Drinking Water has determined that “The Town of Morden has been fulfilling its obligations with regard to bacteriological and disinfection monitoring and reporting”

Copies of test results are kept at the Water plant and copies can be made available by contacting the foreman at the Water plant. Ph# 204-822-5707.

ANNUAL WATER ANALYSIS

Type		Raw	Treated	Distribution	Max Acceptable Concentration	Units
Carbofuran		, 0.2	-	-	90	Ug/L
Dissolved Fluoride	F	0.42	0.86	-	1.5	Mg/L
Nitrate and Nitrite	N	0.66	0.87	-	10	Mg/L
Antimony	Sb	0.0008	0.0008	-	0.006	Mg/L
Arsenic	As	0.0026	0.0009	-	0.010	Mg/L
Barium	Ba	0.024	0.0058	-	1.0	Mg/L
Boron	B	0.13	0.11	-	5	Mg/L
Cadmium	Cd	< 0.00004	< 0.00004	-	0.005	Mg/L
Chromium	Cr	< 0.0002	0.0006	-	0.05	Mg/L
Lead	Pb	0.0002	<0.0002	-	0.01	Mg/L
Selenium	Se	0.0021	0.0018	-	0.01	Mg/L
Uranium	U	0.011	0.0002	-	0.02	Mg/L
Aldrin		< 0.01	-	-	0.7	Ug/L
Methoxychlor		< 0.04	-	-	900	Ug/L
Azinphosmethyl		< 1	-	-	20	Ug/L
Chlorpyrifos		< 0.02	-	-	90	Ug/L
Diazinon		< 0.03	-	-	20	Ug/L
Dimethoate		< 0.2	-	-	20	Ug/L
Malathion		< 0.2	-	-	190	Ug/L
Parathion		< 0.2	-	-	50	Ug/L
Terbufos		< 0.5	-	-	1	Ug/L
Metribuzin		< 0.2	-	-	80	Ug/L
Simazine		< 0.1	-	-	10	Ug/L
Bromodichloromethane		-	-	32 X	16	Ug/L
1,1 Dichloroethene		< 0.1	-	-	14	Ug/L
Methylene Chloride		< 6	-	-	50	Ug/L
Tetrachloroethene		< 0.1	-	-	30	Ug/L
Trichloroethene		< 0.1	-	-	5	Ug/L

	Regulatory Requirement	PWS Performance
Free Chlorine res. - Entering the distribution system	≥ 0.5 mg/l	100%
Free chlorine res. - In the distribution system	≥ 0.10 mg/l	83.8 %

Turbidity - Standard leaving each filter. ≤ 0.30 NTU 100%

Summary - Morden Water Plant is meeting it's regulatory requirements with regard to Free Chlorine residual entering the distribution system and Turbidity leaving each filter. Free chlorine residual in the distribution system is a little below the standard at 83.8 % Corrective measures are being implemented to improve this.

BI-WEEKLY BACTERIAL TESTS

Date	#1 Raw	#2 Treated	#3 Distribution	#4 Distribution	#5 Distribution
January 3, 2008					
Chlorine Free	0	0.84	0.18	0.11	0.04
Chlorine Total	0	1.39	0.37	0.29	0.52
Total Coliforms	0	0	0	0	0
Escherichia Coli	0	0	0	0	0
January 15, 2008					
Chlorine Free	0	0.75	0.04	0.55	0
Chlorine Total	0	1.10	0.28	1.02	0
Total Coliforms	6	0	0	0	0
Escherichia Coli	0	0	0	0	0
January 29, 2008					
Chlorine Free	0	0.79	0.11	0.11	0.50
Chlorine Total	0	1.20	0.38	0.37	0.84
Total Coliforms	6	0	0	0	0
Escherichia Coli	0	0	0	0	0
February 12, 2008					
Chlorine Free	0	0.83	0.27	0.10	0.36
Chlorine Total	0	1.43	0.50	0.47	0.88
Total Coliforms	12	0	0	0	0
Escherichia Coli	0	0	0	0	0
February 26, 2008					
Chlorine Free	0	1.20	0.23	0.21	0.51
Chlorine Total	0	1.62	0.48	0.43	0.97
Total Coliforms	3	0	0	0	0
Escherichia Coli	0	0	0	0	0
March 11, 2008					
Chlorine Free	0	0.87	0.11	0.19	0.82
Chlorine Total	0	1.30	0.55	0.44	1.36
Total Coliforms	1	0	0	0	0
Escherichia Coli	0	0	0	0	0
March 25, 2008					
Chlorine Free	0	1.15	0.25	0.23	0.21
Chlorine Total	0	1.63	0.67	0.48	0.76
Total Coliforms	5	0	0	0	0
Escherichia Coli	0	0	0	0	0
April 8, 2008					
Chlorine Free	0	1.42	0.23	0.11	0.31
Chlorine Total	0	1.94	0.57	0.54	0.97
Total Coliforms	10	0	0	0	0
Escherichia Coli	0	0	0	0	0
April 22, 2008					
Chlorine Free	0	1.12	0.14	0.21	0.88
Chlorine Total	0	1.55	0.57	0.56	1.24
Total Coliforms	43	0	0	0	0
Escherichia Coli	0	0	0	0	0
May 6, 2008					
Chlorine Free	0	1.11	0.10	0.10	0.55
Chlorine Total	0	1.58	0.45	0.45	0.91
Total Coliforms	12	0	0	0	0
Escherichia Coli	2	0	0	0	0
May 21, 2008					
Chlorine Free	0	0.92	0.15	0.12	0.64

Chlorine Total	0	1.37	0.47	0.52	0.91
Total Coliforms	14	0	0	0	0
Escherichia Coli	1	0	0	0	0
June 3, 2008					
Chlorine Free	0	0.70	0.19	0.15	0.69
Chlorine Total	0	1.20	0.53	0.31	1.00
Total Coliforms	118	0	0	0	0
Escherichia Coli	0	0	0	0	0
June 17, 2008					
Chlorine Free	0	0.67	0.07	0.03	0.46
Chlorine Total	0	1.2	0.44	0.34	0.85
Total Coliforms	+ 200	0	0	0	0
Escherichia Coli	27	0	0	0	0
July 3, 2008					
Chlorine Free	0	0.88	0.10	0.10	0.40
Chlorine Total	0	1.38	0.50	0.30	0.60
Total Coliforms	200	0	0	0	0
Escherichia Coli	0	0	0	0	0
July 15, 2008					
Chlorine Free	0	0.72	0.16	0.08	0.38
Chlorine Total	0	1.19	0.69	0.45	0.71
Total Coliforms	+200	0	0	0	0
Escherichia Coli	1	0	0	0	0
July 29, 2008					
Chlorine Free	0	0.86	0.12	0.03	0.17
Chlorine Total	0	1.33	0.38	0.40	0.77
Total Coliforms	+200	0	0	0	0
Escherichia Coli	0	0	0	0	0
August 12, 2008					
Chlorine Free	0	0.64	0.03	0.03	0.29
Chlorine Total	0	1.10	0.43	0.32	0.81
Total Coliforms	+200	0	0	0	0
Escherichia Coli	0	0	0	0	0
August 26, 2008					
Chlorine Free	0	1.05	0.17	0.03	0.15
Chlorine Total	0	01.51	0.68	0.26	0.57
Total Coliforms	+200	0	0	0	0
Escherichia Coli	1	0	0	0	0
September 9, 2008					
Chlorine Free	0	1.11	0.02	0.20	0
Chlorine Total	0	1.62	0.23	0.63	0
Total Coliforms	+200	0	0	0	0
Escherichia Coli	0	0	0	0	0
September 23, 2008					
Chlorine Free	0	0.88	0.05	0.05	0.10
Chlorine Total	0	1.41	0.42	0.11	0.44
Total Coliforms	78	0	0	1	0
Escherichia Coli	1	0	0	0	0
September 26, 2008					
Chlorine Free				Retest	
Chlorine Total				0.16	
Total Coliforms				0.49	
Escherichia Coli				0	
October 7, 2008					
Chlorine Free	0	1.06	0.04	0.02	0.27
Chlorine Total	0	1.60	0.55	0.38	0.78
Total Coliforms	89	0	0	0	0
Escherichia Coli	0	0	0	0	0
October 21, 2008					
Chlorine Free	0	0.96	0.24	0.10	0.48
Chlorine Total	0	1.48	0.59	0.42	0.78
Total Coliforms	+200	0	0	0	0
Escherichia Coli	29	0	0	0	0
November 4, 2008					

Chlorine Free	0	0.23	0.59	0.08	0.40
Chlorine Total	0	0	1.12	0.37	0.51
Total Coliforms	+200	0	0	1	0
Escherichia Coli	3	0	0	0	0
November 7, 2008				Retest	
Chlorine Free					
Chlorine Total					
Total Coliforms				0	
Escherichia Coli				0	
November 19, 2008					
Chlorine Free	0	0.98	0.25	0.18	0.20
Chlorine Total	0	1.38	0.78	0.55	0.57
Total Coliforms	165	0	0	0	0
Escherichia Coli	3	0	0	0	0
December 2, 2008					
Chlorine Free	0	0.88	0.10	0.11	0.12
Chlorine Total	0	1.34	0.48	0.47	0.56
Total Coliforms	200	0	0	0	0
Escherichia Coli	0	0	0	0	0
December 16, 2008					
Chlorine Free	0	0.90	0.17	0.17	0.12
Chlorine Total	0	1.32	0.75	0.77	0.53
Total Coliforms	1	0	0	0	0
Escherichia Coli	0	0	0	0	0

How do we plan to meet Standards for Trihalomethanes? (THMs)

As stated previously Trihalomethanes are formed when chlorine reacts with naturally occurring organic matter in the water. Because of the nature of Lime Soda-Ash softening plants and the amount of chemicals we need to add for softening the water. Treating surface water to meet trihalomethane standards can be challenging. The standard for total THMs is .1 mg/l based on a running average of quarterly samples. There are four compounds which added together form the total THMs. Due to the standards for Chlorine residual in the distribution system being raised we have had to increase the amount of chlorine being added to the water when it leaves the plant. As a result of this there is more Chlorine to react with the organics in the water and thus our THMs levels have increased over last year to an average of .169 mg/l. We are trying to improve our process by fine tuning chemical rates and working with chemical suppliers to find new alternatives for treatment.

We are currently undergoing an engineering assessment which would include investigating the Trihalomethane issue. We are anticipating that the assessment will determine a plan of action to reduce the levels of Trihalomethanes formed.

Trihalomethane Test Results

Date	#1 Public Works Garage	#2 Recreation Centre
February 5, 2008		
THM Preserved		
· Bromodichloromethane	0.019	0.022
· Bromoform	< 0.0001	< 0.0001
· Chloroform	0.055	0.058
· Chlorodibromomethane	0.0036	0.0043
· THMs	0.078	0.084
May 13, 2008		
THM Preserved		
· Bromodichloromethane	0.016	0.021
· Bromoform	< 0.0001	< 0.0001
· Chloroform	0.058	0.065
· Chlorodibromomethane	0.0033	0.0040

· THMs	0.077	0.090
August 6, 2008		
THM Preserved		
· Bromodichloromethane	0.063	0.040
· Bromoform	0.0002	0.0002
· Chloroform	0.18	0.091
· Chlorodibromomethane	0.0061	0.0044
· THMs	0.25	0.14
November 12, 2008		
THM Preserved		
· Bromodichloromethane	0.085	0.092
· Bromoform	0.0008	0.0012
· Chloroform	0.19	0.21
· Chlorodibromomethane	0.026	0.029
· THMs	0.30	0.33

How do we alert Public Works Staff to water emergencies?

The Public Works Department has staff on call 24 hrs. When emergencies arise after hours, residents who call the regular office no. are transferred to the on call staff.

Were there emergencies, regulatory compliance issues or other operational issues to report for 2008?

There were 2 regulatory issues in 2008. On two separate occasions, upon submitting our Bacti-samples we had total Coliform hit of 1. We were notified by the Office of Drinking Water and re-samples were immediately submitted. Both samples came back free and clear of Total coliforms or E-coli.

The following water main and related incidents were:

- Jan 8th - 168 13th St. (Dairy Queen parking lot).
- Feb 2nd - 426 4th St.
- May 11th - 181 Mountain St. South
- June 2nd/3rd - 185 Mountain St. South
- June 4th - 31 Parkhill St.
- June 9th - 191 Mountain St. South
- June 25th - 870 Alvey St.
- Sept 18th - 3 Water Tower Rd. (2" beach service)
- Sept 30th - 3 Water Tower Rd. (12" supply line)
- Nov 11th - Golf Course (pipeline excavation)

Were there any major expenses incurred in 2008?

No major expenses were incurred outside of the operating budget

Future system expansion or expenses expected?

The water tower condition will be assessed in the future; depending on finding these towers may need replacing. A cost estimate is not available at this time.

Who can we call with questions or concerns regarding drinking water?

For general questions during business hours, call the Town of Morden office from 9:00 a.m. to 4:30 p.m. or email tmorden@mordenmb.com